HE ENTRECOMP DIGCOMP

GUIDE FOR THE DEVELOPMENT OF ENTRECOMP AND DIGCOMP FRAMEWORK IN HIGHER EDUCATION



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INDEX

1. Introduction ..... Page 04
   1.1. Brief presentation of Erasmus+ program and KA2 Projects ..... Page 04
   1.2. Presentation of the project ..... Page 06
   1.3. Objectives ..... Page 08
   1.4. Training Activities ..... Page 09
   1.5. Intellectual Outputs ..... Page 12
2. Competences acquisition frameworks ..... Page 13
   2.1. European Entrepreneurship Competences Framework ..... Page 13
      2.1.1. Description of the framework, target and objectives ..... Page 13
      2.1.2. Dimensions, areas and levels ..... Page 14
      2.1.3. How to use the framework ..... Page 20
   2.2. European Digital Competence Framework ..... Page 21
      2.2.1. Description of the framework, target and objectives ..... Page 22
      2.2.2. Dimensions, areas and levels ..... Page 22
      2.2.3. How to use the framework ..... Page 26
   2.3. Common areas shared between the frameworks ..... Page 27
3. Innovative Methodologies in Higher Education ..... Page 29
   3.1. Design and planning of Technology based social and educational projects ..... Page 30
   3.2. Design thinking ..... Page 31
   3.3. Gamification ..... Page 32
   3.4. Other innovative Methodologies for Entrecomp and Digcomp competences acquisition ..... Page 35
      3.4.1. What does "Hackathon" mean? ..... Page 36
   3.5. Educational Technology &Technological Education ..... Page 38
   3.6. Open Source and open Acces Technology ..... Page 40
   3.7. Nettiquete, cibersecurity, licensing and behaviour in digital enviroments ..... Page 42
4. Application in Higher Education ..... Page 46
   4.1. Instructional Activities for the project: designing, implementation and results collecting ..... Page 48
- **B Guide of entrepreneurial projects in higher education** ..... Page 67

1. INTRODUCTION

1.1 Brief presentation of the Erasmus+ Program and the Key Action 2 Project

Erasmus+ is the European Union's programme to support education, training, youth and sport in Europe in various fields:

- Higher education
- Vocational education and training
- School education (including early childhood education and care)
- Adult education
- Youth and sport

It aims to help generations of Europeans to become active citizens, equipping them with the skills, knowledge and experience to tackle the challenges facing our society, both now and in the years to come. These include rising unemployment, climate change, economic and post-conflict migration, digitalisation, globalisation, physical inactivity and the multilingual structure of Europe's united but diverse nations.

The political priorities of Erasmus+, identified by the European Commission for the period 2021-2027, are:

Inclusion and diversity to promote equal opportunities and access, an Inclusion and Diversity Strategy covering all programme fields is devised to support an easier access to funding for a wider range of organisations, and to better reach out to more participants with fewer opportunities.

Digital transformation the COVID-19 crisis shed light on the importance of digital education for the digital transformation that Europe needs. In particular, it emphasised the increased need to harness the potential of digital technologies for teaching and learning and to develop digital skills for all, in line with the strategic priorities of the Digital Education Action Plan (2021-2027).

Environment and fight against climate change are key priorities for the EU now and in the future. The European Green Deal is the European new growth strategy and recognises the key role of schools, training institutions and universities to engage with pupils, parents, and the wider community on the changes needed for a successful transition to become climate neutral by 2050.https://time2hack.es/



Participation in democratic life: the Programme addresses the citizens' limited participation in its democratic processes and their lack of knowledge about the European Union, and tries to help them overcome the difficulties in actively engaging and participating in their communities or in the Union's political and social life.

The Erasmus+ priorities and activities are enshrined in the European Education Area, Digital Education Action Plan and the European Skills Agenda. Also, the Programme supports the European Pillar of Social Rights, implements the EU Youth Strategy 2019-2027, develops the European dimension in sport.

Erasmus+ projects address many of the challenges that Europe faces, both now and in the years to come through formal and non-formal learning, transnational mobility, exchange of good practices, volunteering and solidarity, while recognising the potential of sport to promote cooperation, both within and across frontiers. There are projects that help us move towards a more circular, green economy, where little is wasted, and pollution is minimised. Other projects nurture the democratic process in Europe and its influence globally. There are projects that focus on inclusion of those who are socially or economically marginalised, while others help enhance youth's entrepreneurial and digital skills, just as the "DEVELOPMENT OF ENTRECOMP AND DIGCOMP FRAMEWORK IN HIGHER EDUCATION (Agreement n° 2020-1-TR01-KA203-094706)" project seeks to do.

In order to achieve its objectives, the Erasmus+ Programme foresees the implementation of the following Actions:

KEY ACTION 1 MOBILITY OF INDIVIDUALS

the flagship activity of Erasmus+ and supports learning experiences in another country for learners and staff of education institutions and civil society organisations; youth participation activities; DiscoverEU activities for 18-years-old young people; language learning opportunities.

KEY ACTION 2 COOPERATION AMONG ORGANISATIONS AND INSTITUTIONS

Enhancing organisations' access to the Programme and their capacity to operate jointly at transnational level; partnerships for excellence in higher education, vocational education, teacher education; partnerships for innovation and forward-looking projects; capacity building project; non-for-profit sport events. The present project responded to the Erasmus+ Call 2020 Round 1 Key Action 2 "Cooperation for innovation and the exchange of good practices", having Innovation as a major objective. This action is aimed at increasing the support for projects that foster cooperation and exchange of practices, allowing key actors to make better use of new technologies, develop innovative teaching, training and learning methods, promote non-formal learning and develop common tools and activities.

KEY ACTION 3 SUPPORT TO POLICY DEVELOPMENT AND COOPERATION

Covering initiatives contributing to national and EU-level reforms and modernisation in the fields of education, training, youth and sport. These goals are pursued through peer learning and exchanges, analytical work, surveys, studies, and cooperation with other international organisations.

JEAN MONNET ACTIONS

Promoting teaching and research on European integration involving the academic world and policy-makers, as well as schools and vocational education and training institutes.

1.2 Presesentation of the project

Increasing youth employment is a fundamental objective of the EU employment policy and falls within the context of the Europe 2020 growth and employment strategy. Our main priority, the development of entrepreneurship skills among higher education students, is based on the increasingly dynamic environment in which we live, mainly in Europe.

Globalization and the new labor market make young people face changing environments that demand adaptive capacity, creativity, initiative, self-motivation, dealing with ambiguity, learning from their own experience, etc. These and other competences (such as teamwork, resource management, financial literacy, planning capacity and ethical and sustainable thinking) are competences included in the EntreComp framework of entrepreneurship competencies
to face economic, social and cultural challenges in today's world.

PRESENTATION OF THE PROJECT

On the other hand, the development of these entrepreneurial skills is a way to empower higher education students - from a participatory and creative methodology - to promote their motivation and commitment to their professional future as well as to arouse their interest to participate and connect with other young people, exercising their European citizenship. It is not only an opportunity for students to improve their skills and abilities, but also for them to become more socially involved and promote their participation internationally.

Several studies support the thesis that technical and theoretical training by itself is no longer sufficient to enter the labor market with all the consequences that it entails: impossibility of economic and residential independence of young people, identity crisis, perceived defenselessness learned, etc. That is why it is very important to develop other types of skills that are more transversal and useful in the current labor market, such as the 15 competencies included in the three areas of competence of the European EntreComp Framework.

In addition, digital literacy and the development of digital skills are also key to adapt to a society and a labor market in which digital technologies are increasingly present with a tendency to further increase their importance in life and work. That is why we also rely on DigComp, the European framework of digital skills, which includes communication and collaboration through digital technologies (interact, share, exercise citizenship, etc.), develop, create and program digital content, cybersecurity, problem solving through digital technologies, etc.

Social entrepreneurship is also a key part of this project, since through HACKATHON events students will design and create prototypes of new technology-based solutions to address the Sustainable Development Goals (SDG or SDG). In this way we encourage students to think about the problems they see and face in their communities, countries and the European Union itself that are related to the SDGs. And then we give them tools and methodologies to create their own solutions while acquiring and developing entrepreneurship and digital skills.

During the celebration of HACKATHON activities, higher education students of different profiles will work in teams, having to collaborate to achieve their objectives. In addition, they will also be able to assess the ideas of other participants as it is an event that has the participation of 5 countries. Collaborative work, analysis, creative thinking, initiative, product development through prototypes, the presentation of ideas will be promoted. They will also have the opportunity to work in networks and connect with other European higher education students. They will gain self-esteem and empowerment.

The creation of an intellectual product is planned "GUIDE FOR THE APPLICATION OF ENTRECOMP AND DIGCOMP FRAMEWORK IN HIGHER EDUCATION" which will include the systematization of the use of EntreComp in higher education, as well as examples of application in different subjects and specialties created by the teachers themselves participating in the project.

1.3 OBJETIVES

On the other hand, two joint training activities are planned, one aimed at teachers of higher education in which they will know in detail the European EntreComp framework as well as a systematization to adapt it to their respective subjects and pecialties. In this way they will have tools to teach entrepreneurship skills (collected in EntreComp) to their students in a simple and methodologically effective way.

And another aimed at the winning students who can share their ideas in a Youth Exchange while presenting their projects in the final multiplier event. Facilitating this acquisition and learning is the key part of our project, without neglecting participatory, fun and motivational methodologies so that the process is attractive, generates positive emotions and thus facilitates meaningful learning.

The general objective of the project is to develop entrepreneurship and digital skills in higher education students in Europe. For this, the following Specific Objectives are proposed:

SO1 - Develop entrepreneurship skills in European higher education students.

SO2 - Develop digital skills in European higher education students.

SO3 - Train higher education teachers in the European EntreComp framework as well as their possible applications.

SO4 - Train higher education teachers in the systematization of the use of EntreComp to teach entrepreneurship skills to their students.

SO5 - Promote the participation of higher education students in a European-level project that will result in an improvement of their social skills - communication, self-esteem, involvement, teamwork, assertiveness, language skills and social awareness.

SO6 - Promote cooperation between public administration, associations, companies and educational centers at national and European level.

SO7 - Share the good practices developed between the partners and participating countries.

SO8 - Disseminate the results and tools among teachers of higher education, educational centers, teacher training centers, informal organizations, public institutions, municipalities and companies.



1.4 TRAINING ACTIVITIES

During the implementation of the project, various activities are planned.

Training course: Development of entrepreneurial competence and innovation.

It is a training course for teachers within the Higher Education field. The teachers who participate in this training will be collaborating with their educational centers in the Hackathon events planned for the 4 participating countries and will implement an education program based on EntreComp and DigComp methodologies in Higher Education.

The general objective of this activity is to train Higher Education teachers in the EntreComp and DigComp methodologies and in the use of HACKATHON as an innovative tool for improving entrepreneurial skills and digital innovation. The teachers will incorporate entrepreneurships and digitalization methodologies in their subjects and spread them among their colleagues. Moreover, they will create a network with teachers from other countries and maintain contacts and collaborations at the end of the project.

The training activity will be carried out through a participatory methodology and presenting practical examples and cases. The teachers will know how to apply the innovative methodologies in Hackathon events or in the project that they implement ENTRECOMP and DIGCOMP methodologies in their classes.

Likewise, all training will be managed and coordinated by technical experts in innovative methodologies belonging to the coordinating organization AIDEJOVEN and will also be specialists in the application of ENTRECOMP and DIGCOMP in the educational field.

Implementation of Hackathons

A total of four Hackathones will be held in each participating: Spain, Italy, Greece and Turkey. The participants will be Higher Education students, selected by a Technical Committee established by the country's organization. The Committee will consider the academic performance, specialization and values promoted by the EU of each candidate.

Five teams of four people will be arranged, and they will work in the same space for 52 hours on an SDG goal. When the time finishes, a jury will evaluate the prototypes and the best one will be included in the Guide for the Development of Enterprise Competence and Innovation.



The objective of the Hackathon will be to design and develop technology-based prototypes to solve any problem related to a Sustainable Development Goal (SDG) of the 17 that the EU marks.

Second training course: development of entrepreneurial competence and innovation.

This training will allow teachers to share the good practices learned in the implementation of their educational project in their schools. They will be able to share which are the most effective tools and strategies when implementing the EntreComp and DigComp methodology, the results obtained and the possible improvements or challenges in its implementation. In addition, they will be able to learn more about the SDGs and the challenges that other countries face in relation to them. In this way, it expands its vision and knowledge of the European Union in a deep and meaningful sense.

The general objective of the second training will be to share good practices among professionals on the implementation of the EntreComp and DigComp methodology in Higher Education, as well as the Hackathon events.

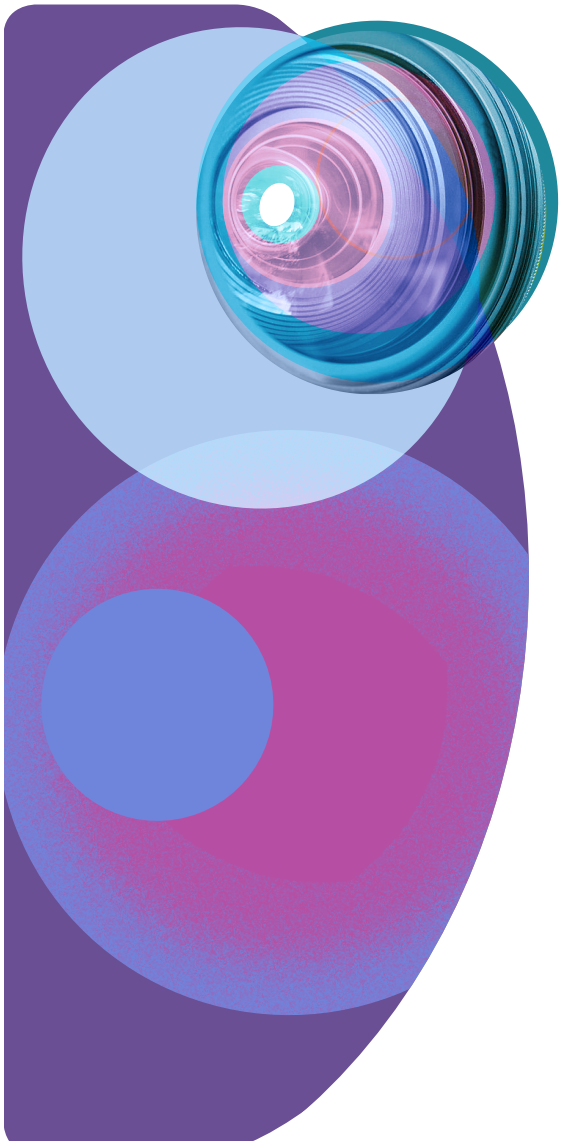
The training will be dynamic and participatory. The professionals who have coordinated the projects and Hackathon will be in charge of explaining the most outstanding activities in an experiential way, so that all the participants can better understand and internalize the good practices that are shared.

Furthermore, the playful and dynamic environment will allow a better relationship between professionals, who will be able to establish new collaboration synergies by creating solid networks for future projects.

Moreover, the training will take place at the same time of the last activity of the project, the multiplier event. This represents a unique opportunity to show results to other associations, organizations, public administrations, educational centers, companies and potential investors.

Multiplier Event

At the end of the project, a Multiplier Event is planned. The target audience of the multiplier event will be different, to increase the impact of the project and promote interest and the dissemination of tools and results. There will be educational centers that work with Higher Education students: universities, training centers, VET centers; public institutions that work with students or finance projects; technology companies and possible prototype and Start-Ups funders; students or teachers with an interest in entrepreneurship and / or digital technology; professional associations; NGOs to care for people at risk of social exclusion; disability associations; students with winning projects from partner organizations.



The objectives of the event are:

- Publicize the Erasmus + Program and its possibilities.
- Publicize the HACKATHON FOR HIGHER EDUCATION project, its results and its impact.
- Presentation of the "GUIDE for the Development of Entrepreneurial Competition and Innovation"
- Publicize the ENTRECOMP and DIGCOMP methodologies in the field of Higher Education
- Publicize the tools for non-formal education used, their usefulness and benefits.
- Present the winning prototypes of technology-based solutions for a student-created SDG challenge.
- Awards ceremony for the winning prototypes.
- Promote greater impact by seeking possible financing for prototypes or creation of Start-Ups.

It will be divided in several parts:

- Inauguration by the competent authority.
- Presentation of the entire project, its objectives, results and impact: OSTIM as coordinator of the project will be in charge of this part.
- Presentation of the development, results and impact in each of the partner countries: the partner organization of each country will be in charge of presenting these data.
- Presentation of the intellectual products by the corresponding leaders.
- Presentation of prototypes of each group of students: students from each country will present their ideas for technology-based solutions to a challenge of an SDG important to their country.
- The attending public will have the opportunity to see the results of the project and the methodologies.
- Closure and dismissal: information will be provided on where the generated materials can be consulted and downloaded.

In addition, the possibility of financing a Start-Up or prototype of the student groups will be offered.



1.5 INTELLECTUAL OUTPUTS

This project includes the design of the two Intellectual Outputs according to a common design shared by all partners initially in English and once approved, it will be translated into Spanish, Italian, Greek and Turkish.

The first intellectual output is the Guide For the Development of the Entrepreneurship Competence and the Innovation. The target group will be Higher Educational Centers and Teachers. This guide will include information that will be used during the first training activity. It will contain theoretical material on the European Reference Frameworks in Entrepreneurship and Digital Competences (ENTRECOMP and DIGCOMP), and will offer innovative tools and techniques and good practices developed by all partners and also instructions on planning technology-based projects. The second part will be presented during the second training activity and will include the specific ideas and projects that teachers have implemented in their educational centers and the results.

The second intellectual output is the Guide For the Development of Entrepreneurial Projects in Higher Education and the target group will be Students of Higher Education. Teachers will collect in this guide the explanations of the organization of a HACKATHON, as well as the final prototypes of each of the events in each country, so that they can be disseminated and made available to potential investors or interested companies.

The objective of the guide is to recollect the results of the organization of the different HACKATHON events in each country. Teachers will collect in this guide the explanations of the organization of a HACKATHON, as well as the final prototypes of each of the events in each country, so that they can be disseminated and made available to potential investors or interested companies.

2 COMPETENCES ACQUISITION FRAMEWORKS

2.1 European Entrepreneurship Competences Framework

The Entrepreneurship Competence Framework (EntreComp) is the European Reference Framework that offers a tool to improve the entrepreneurial capacity of European citizens and organisations.[1] It was developed by the Joint Research Centre (JRC) in January 2015 of the European Commission on behalf of the Directorate General for Employment, Social Affairs and Inclusion (DG EMPL) although its origins go back to 2006 when the European Union n Union proposed the 'sense of initiative and entrepreneurship' as one of the eight key competences for lifelong learning.

2.1.1 Description of the framework, target and objectives

The European Entrepreneurship Competences Framework (EntreComp) is set to become a reference for any initiative aiming to foster entrepreneurial capacity of European citizen as it includes in a coherent framework the skills, attitudes and values required for today´s modern European and global entrepreneurial mindset.

The EntreComp ultimately aims to facilitate peer learning and exchange among Member States and eventually to have a positive impact on the mobility, employability and active participation of citizens in society and the economy. By establishing a common basis that initiatives dealing with the pro-motion of entrepreneurship as a competence across levels of education, sectors, do-mains and purposes of application can refer to, the EntreComp will contribute to unleash European citizens potential to participate in all areas of society by transforming ideas into action. (Bacigalupo et al., 2016, p.7).[2]

EntreComp, in order to achieve its aims, formulates a conceptual model that includes all key components of entrepreneurship as a competence in order all actors in entrepreneurial learning can share it and refer to. Therefore, the several learning outcomes developed suggest what European citizens should know, understand and be able to do to demonstrate a certain level of proficiency in entrepreneurship competence.

There are 5 key building blocks to understanding EntreComp: definition, areas, competences, threads and progression levels.

1 https://joint-research-centre.ec.europa.eu/entrecomp-entrepreneurship-competence-framework_en, [Accessed 5 April 2022].
2 Bacigalupo, M., Kampylis, P., Punie, Y., Van den Brande, G. (2016). EntreComp: The Entrepreneurship Competence Framework. Luxembourg: Publication Office of the European Union; EUR 27939 EN; doi:10.2791/593884



In the context of the EntreComp Framework, entrepreneurship is understood as a transversal key competence applicable by individuals and groups, including existing organisations, across all spheres of life. It enables citizens to nurture their personal development, to actively contribute to social development, to enter the job market as employee or as self-employed, and to start-up or scale-up ventures which may have a cultural, social or commercial motive. It is defined as follows: 'Entrepreneurship is when you act upon opportunities and ideas and transform them into value for others. The value that is created can be financial, cultural, or social.[3]

EntreComp Framework reflects the complexity of the entrepreneurship competence domain, which touches upon several aspects of our everyday lives and can be used as a multi-purpose reference guide. Moreover, it can be used as a basis for the development of curricula and learning activities fostering entrepreneurship as a competence. Also, it can be used for the

2.1.2 Dimensions, areas, competences, threads, levels and learning outcomes

Dimensions, Areas and Competences

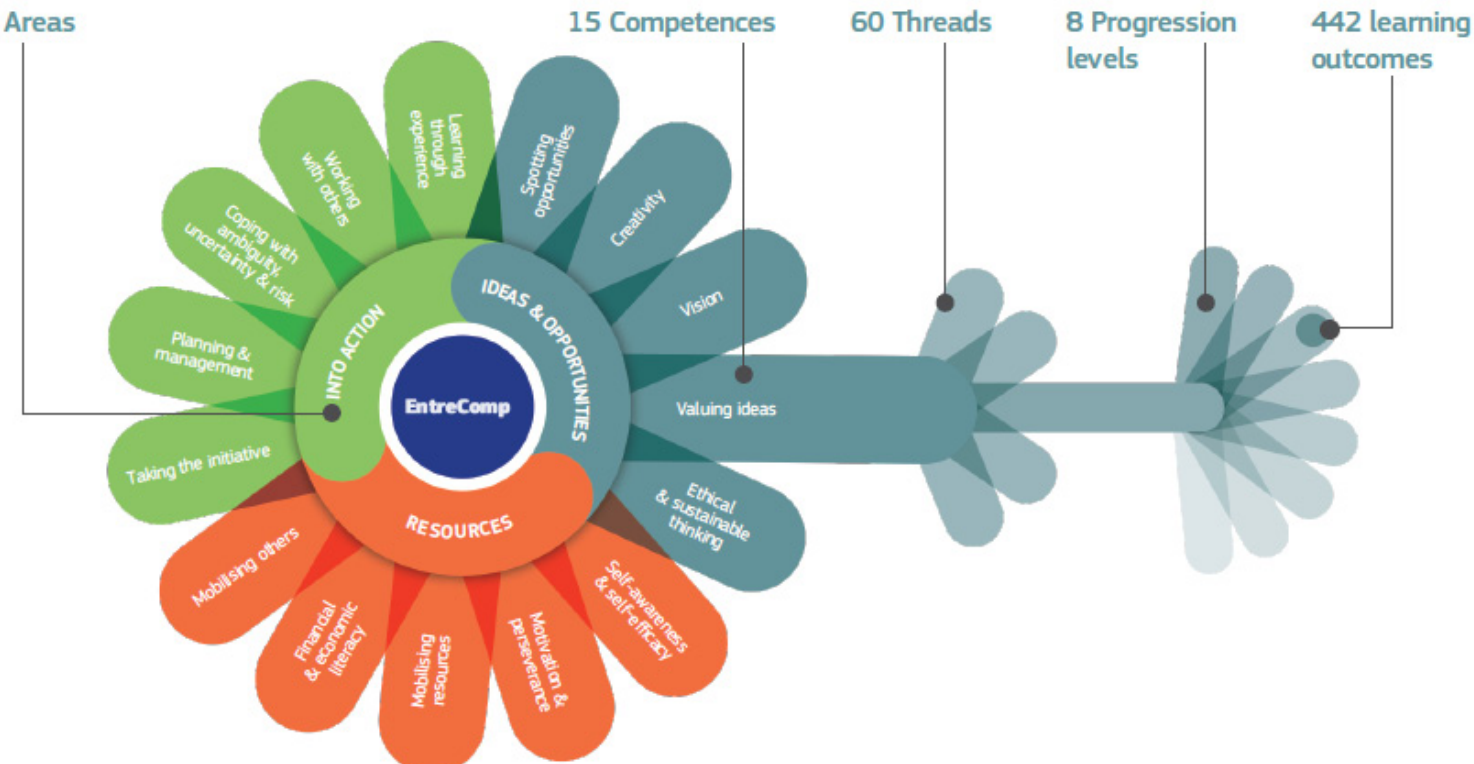
The EntreComp conceptual model is made up of **two main dimensions**: (1) the **3 competence areas** that directly mirror the definition of entrepreneurship as the ability to turn ideas into action that generate value for someone other than oneself and (2) **the 15 competences** that, together, make up the building blocks of the entrepreneurship as a competence for all citizens which is regarded both as an individual and collective capacity that stands above all three areas together.

EntreComp is a framework of 3 interrelated and interconnected competence areas 'Ideas and opportunities', 'Resources' and 'Into action'. Each of the areas is made up of 5 competences, 15 entrepreneurship competences in total, broken down further into 60 threads, defined through a comprehensive list of 442 learning outcomes which are mapped across 8 different levels of progression from beginner to expert.

3. ibid, p.10

EntreComp in Summary

Figure 1 EntreComp in Summary[4]



These three Entrepreneurship areas present entrepreneurship as a multidimensional competence as EntreComp presents the ability to transform "ideas and opportunities" "into action" by "mobilising resources". All the above (Figure 1) are interrelated and interconnected and they should be seen as a whole.

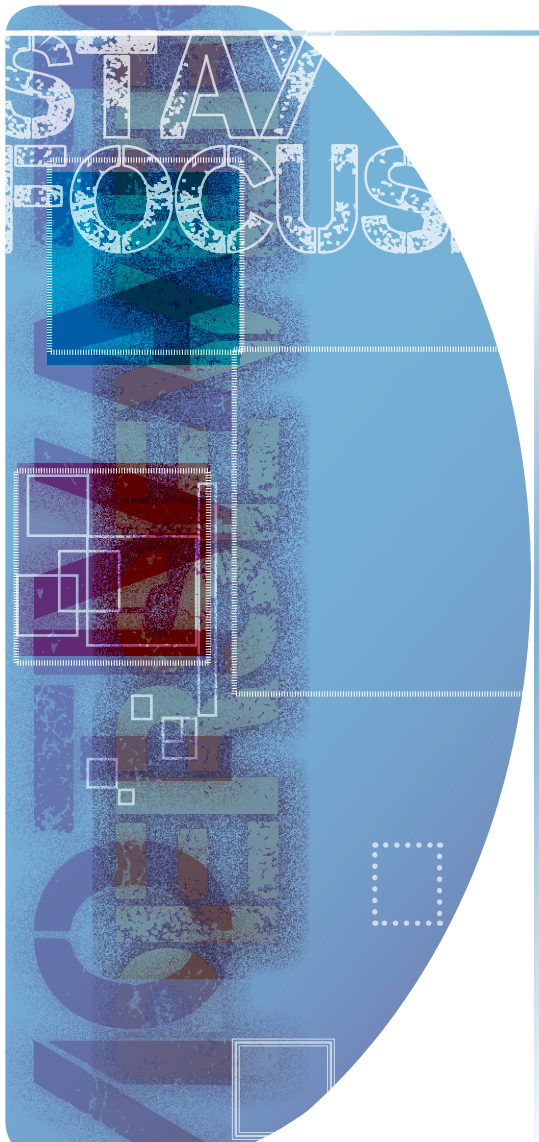
4. European Union (2018) EntreComp: The European Entrepreneurship Competence Framework, p. 10

The circular pattern of the model implies that there is not a compulsory sequence in the acquisition process or a hierarchy but as Bacigalupo et al.,(2016, p.11) refer 'the EntreComp Framework can be seen as a starting point for the interpretation of the entrepreneurship competence, which over time will be further elaborated and refined to address the particular needs of specific target groups' and that in the following overview of the model the competences are numbered only for ease of reference.

EntreComp conceptual model[5]

Areas	Competences	Hints	Descriptors
Ideas and opportunities	**1.1 Spotting opportunities**	Use your imagination and abilities to identify opportunities for creating value.	• Identify and seize opportunities to create value by exploring the social, cultural and economic landscape. • Identify needs and challenges that need to be met. • Establish new connections and bring together scattered elements of the landscape to create opportunities to create value.
	1.2 Creativity	Develop creative and purposeful ideas.	• Develop several ideas and opportunities to create value, including better solutions to existing and new challenges. • Explore and experiment with innovative approaches. • Combine knowledge and resources to achieve valuable effects.
	1.3. Vision	Work towards your vision of the future.	• Imagine the future • Develop a vision to turn ideas into action • Visualise future scenarios to help guide effort and action
	1.4 Valuing ideas	Make the most of ideas and opportunities.	• Judge what value is in social, cultural and economic terms • Recognise the potential an idea has for creating value and identify suitable ways of making the most out of it.
	1.5 Ethical and sustainable thinking	Assess the consequences and impact of ideas, opportunities and actions.	• Judge what value is in social, cultural and economic terms • Recognise the potential an idea has for creating value and identify suitable ways of making the most out of it.

5 Bacigalupo, M., Kampylis, P., Punie, Y., Van den Brande, G. (2016). EntreComp: The Entrepreneurship Competence Framework. Luxembourg: Publication Office of the European Union; EUR 27939 EN; doi:10.2791/593884



Areas	Competences	Hints	Descriptors
Resources	**2.1 Selfawareness and selfefficacy**	Believe in yourself and keep developing.	• Reflect on your needs, aspirations and wants in the short, medium and long term. • Identify and assess your individual and group strengths and weaknesses. • Believe in your ability to influence the course of events, despite uncertainty, setbacks and temporary failures.
	2.2 Motivation and perseverance	Stay focused and don´t give up.	• Be determined to turn ideas into action and satisfy your need to achieve. • Be prepared to be patient and keep trying to achieve your long-term individual or group aims. • Be resilient under pressure, adversity, and temporary failure.
	2.3 Mobilizing resources	Gather and manage the resources you neaed.	• Get and manage the material, non-material and digital resources needed to turn ideas into action. • Make the most of limited resources. • Get and manage the competences needed at any stage, including technical, legal, tax and digital competences.
	2.4 Financial and economic literacy	Develop financial and economic know how.	• Estimate the cost of turning an idea into a value creating activity. • Plan, put in place and evaluate financial decisions over time. • Manage financing to make sure my value-creating activity can last over the long term.
	2.5. Mobilizing others	Inspire, enthuse and get others on board.	• Inspire and enthuse relevant stakeholders. • Get the support needed to achieve valuable outcomes. • Demonstrate effective communication, persuasion, negotiation and leadership.
	3.1 Taking the initiative	Go for it	• Initiate processes that create value. • Take up challenges. • Act and work independently to achieve goals, stick to intentions and carry out planned tasks.



Areas	Competences	Hints	Descriptors
	3.2 Planning and management	Prioritize, organize and follow-up.	• Set long-, medium- and short-term goals. • Define priorities and action plans. • Adapt to unforeseen changes.
Into Action	**3.3 Coping with uncertainty, ambiguity and risk**	Make decisions dealing with uncertainty, ambiguity and risk.	• Make decisions when the result of that decision is uncertain, when the information available is partial or ambiguous, or when there is a risk of unintended outcomes. • Within the value-creating process, include structured ways of testing ideas and prototypes from the early stages, to reduce risks of failing. • Handle fast-moving situations promptly and flexibly.
	3.4 Working with others	Team up, collaborate and network.	• Work together and co-operate with others to develop ideas and turn them into action. • Network. • Solve conflicts and face up to competition positively when necessary.
	3.5. Learning through experience	Learn by doing	• Use any initiative for value creation as a learning opportunity. • Learn with others, including peers and mentors. • Reflect and learn from both success and failure (your own and other people's).

Threads and Progression Levels

Within each of the 15 competences are a number of **different threads** that describe what the particular competence really means in practical terms.

For example, in the **area** of **Ideas and opportunities (1)**, one of the **competences** is **Creativity (1.2)**. For Creativity the **threads** are: Be curious & open **(1.2.1)**, Develop ideas **(1.2.2)**, Define problems **(1.2.3)**, Design value **(1.2.4)**, Be innovative **(1.2.5)**.

In the **area of Resources (2)**, one of the **competences** is **Mobilising Resources (2.3)**. For this competence the threads are: Manage Resources (material and nonmaterial) **(2.3.1)**, Use resources responsibly **(2.3.2)**, Make the most of your time **(2.3.3)**, Get support **(2.3.4)**.



In the **area** of **Into Action (3)**, one of the **competences** is **Working with others (3.4)**. For this competence the threads are: Accept diversity (people's differences) **(3.4.1)**, Develop emotional intelligence **(3.4.2)**, Listen actively **(3.4.3)**, Team up **(3.4.4)**, Work together **(3.4.5)**, Expand your network **(3.4.5)**.

The full set of threads for each competence can be accesses also on in the **EntreComp Into Action –User Guide.**[6]

According to EntreComp (Bacigalupo et al., 2016, p.14-15), the **progression** in entrepreneurial learning is made up of two aspects,

1. **Developing increasing autonomy and responsibility in acting upon ideas and opportunities to create value and,**
2. **Developing the capacity to generate value from simple and predictable contexts up to complex, constantly changing environments.**

EntreComp uses four main levels of measuring and evaluating one's skills and progress **(proficiency levels)**: Foundation, Intermediate, Advanced and Expert levels. At Foundation level, entrepreneurial value is created with external support, at Indermediate level is created with an increased autonomy whereas at the Advanced level responsibility is developed and at the final Expert level, the value created has considerable impact.

Hence, the **eight levels of progression** from beginner to expert are:

- **Foundation** - Relying on support from others, Discover and Explore: Under direct supervision **(L1)** and With reduced support from others, some autonomy and together with my peers (L2)
- **Intermediate** -Building independence, Experiment and Dare: On my own and together with my peers **(L3)** and Taking and sharing some responsibilities **(L4)**.
- **Advanced** -Taking responsibility, Improve and Reinforce: With some guidance and together with others **(L5)** and Taking responsibility for making decisions and working with others **(L6)**.
- **Expert** - Driving transformation, innovation and growth, Expand and Transform:
  Taking responsibility for contributing to complex developments in a specific field **(L7)** and Contributing substantially to the development of a specific field **(L8)**.

6 Mccallum, E., Weicht, R., Mcmullan, L. and Price, A., EntreComp into Action - Get inspired, make it happen: A user guide to the European Entrepreneurship Competence Framework, Bacigalupo, M. and O`keeffe, W. editor(s), EUR 29105 EN, Publications Office of the European Union, Luxembourg, 2018, ISBN 978-92-79-79360-8, doi:10.2760/574864, JRC109128. , http://europa.eu/!kR69Tb

Learning Outcomes

Within the European Entrepreneurship Competences Framework, the 442 learning outcomes mapped are actually statements of what a learner knows and understands. However, the list is not exhaustive. These many learning outcomes do not need to be precise but as a basis for curricula development and educational planning and related indicators suggesting.

Transversal applicability across educational contexts and application sectors or as Bacigalupo et al. (2016, p.17) argue 7 "Entrepreneurial learning can hardly be reduced to fixed pre- specific statements of learning outcomes since it deals with the creation of value that does not exist prior to the entrepreneurial learning process and cannot be foreseen in abstraction". All learning outcomes are presented in the Appendix of the above.

2.1.3 How to use the framework

The development of the entrepreneurial capacity of European citizens and organisations is one of the key policy objectives for the EU and Member States. European Entrepreneurship Competences Framework (EntreComp) has contributed for entrepreneurship to be seen as a transversal key competence applicable by individuals and groups, including organisations, across all spheres of life and not just business and economy.

EntreComp was formulated after contribution and review by a wide range of stakeholders and large and heterogeneous group of experts and well received by them. As a flexible reference framework EntreComp can be used supporting policy and practice to develop entrepreneurial skills including support to European citizens and SMEs to transform ideas into action into different settings. The main uses of the framework can be categorised as following.

1. **Policy and policy makers: by influencing policy and supporting policy makers to define a common understanding on the entrepreneurship competence and skills as well as the entrepreneurial impact and its indicators and to develop related policies linked to different settings (education and training, economy, employment) and inclusion activities at a local, regional, national or even European level.**
2. **Education and training: the EntreComp model may be applied to formal, non-formal and informal learning contexts and as a tool can be adapted to different needs and target groups. Therefore, it may be used to develop education and training initiatives and curricula related to entrepreneurship and to tailor entrepreneurial learning outcomes to a specific context.**

3. **Employment and SMEs development: It may be used to design activities that provide practical entrepreneurial experiences for young people both inside and outside formal education, as well as training initiatives for skills and employment, to help entrepreneurs (especially the young ones) map their own entrepreneurial competences, and provide support by new training design to start-ups and SMEs initiation and development as well as in organisations and businesses of all sizes.**
4. **Assessment and Certification: It may be used to design assessment of entrepreneurial learning and certification.**

The stakeholders include a wide range of actors from policy makers, educational and training as well as employment and local/regional development authorities, those interested and working in formal education, non-formal learning and inclusion activities as public and private training institutions, Higher Education Institutions, Human Resource Organisations, to Start-ups, organisations and businesses of all sizes, Chambers of Commerce and sectoral organisations.

2.2 European Digital Competence Framework

The European Digital Competence Framework (DigComp) is the European reference framework to support a shared, comprehensive understanding of digital competences. DigComp maps the knowledge, skills and attitudes we all need to use digital technologies in a critical, collaborative and creative way in all aspects of life. From 2013, DigComp has been used for multiple purposes, particularly in the context of employment, education and training, and lifelong learning.

Today, being digitally competent means that people need to have competences in all areas of DigComp.

2.2.1 Description of the framework, target and objectives

The European Digital Competence Framework offers a tool to improve citizen´s digital competence, to help policymakers to formulate policies that support digital competence building, and to plan education and training initiatives to improve digital competence of specific target groups.

DigComp also provided a common language on how to identify and describe the key areas of digital competence and thus offered a common reference at European level.

DigComp sets out 21 different competences in 5 key areas that describe what it means to be digitally competent. Each competence has associated learning outcomes mapped from the most basic to highly specialized levels.

DigComp focuses on people and their skills. It is important to be creative, to communicate more effectively and solve problems through digital technology.



It can be adapted and applied to support policy or practice, to develop digital competence for a target population in a specific context. It can be used to assess digital competence level, strengths and weaknesses of an individual or target population.

Specifically, the main target of DigComp is the development and digital competences of citizens, policymakers, educators, trainers and teachers. DigComp can be used to design teaching and learning experiences for the individual learners to develop their digital competences.

Moreover, it can be used to identify, assess and certify learning achievements and digital competence development. The Digital Competence Framework can help with self- evaluation, setting learning goals, identifying training opportunities and facilitating job search.

Regarding the main objectives of DigComp, we catalogue 3 main goals:

1. Strategic support for policy-formulation is one of the purposes of DigComp use at the national and regional level.

2. Instructional planning DigComp has mostly been taken up to develop education and training initiatives for education, skills and employment purposes.

3. Assessment tools for assessing one's own digital competence constitute one of the most visible areas of all DigComp implementations. Various stakeholders have operationalized DigComp as a publicly and freely used tool.

2.2.2 Dimensions and areas

DigComp identifies the key components of digital competence through 5 main areas which can be summarized as below. For each area, DigComp sets out different competences in 5 key areas. Each competence has associated learning outcomes mapped from the most basic to highly specialized levels:

1. Information and data literacy

To articulate information needs, to locate and retrieve digital data, information and content.

To judge the relevance of the source and its content. To store, manage, and organize digital data, information and content.

1.1. Browsing, searching and filtering data, information and digital content

To articulate information needs, to search for data, information and content in digital environments, to access them and to navigate between them. To create and update personal search strategies.



1.2. Evaluating data, information and digital content

To analyze, compare and critically evaluate the credibility and reliability of sources of data, information and digital content. To analyze, interpret and critically evaluate the data, information and digital content.

1.3. Managing data, information and digital content

To organize, store and retrieve data, information and content in digital environments. To organize and process them in a structured environment.

In the second area, DigComp identifies 6 competences:

2. Communication and collaboration

To interact, communicate and collaborate through digital technologies while being aware of cultural and generational diversity.

To participate in society through public and private digital services and participatory citizenship. To manage one's digital identity and reputation.

2.1. Interacting through digital technologies

To interact through a variety of digital technologies and to understand appropriate digital communication means for a given context.

2.2. Sharing through digital technologies

To share data, information and digital content with others through appropriate digitaltechnologies. To act as an intermediary, to know about referencing and attribution practices.

2.3. Engaging in citizenship through digital technologies

To participate in society using public and private digital services. To seek opportunities for self-empowerment and for participatory citizenship through appropriate digital technologies.

2.4. Collaborating through digital technologies

To use digital tools and technologies for collaborative processes, and for co-construction and co-creation of resources and knowledge.

2.5. Netiquette

To be aware of behavioral norms and know-how while using digital technologies and interacting in digital environments. To adapt communication strategies to the specific audience and to be aware of cultural and generational diversity in digital environments.



2.6. Managing digital identity
To create and manage one or multiple digital identities, to be able to protect one´s own reputation, to deal with the data that one produces through several digital tools, environments and services.

3. Digital content creation
To create and edit digital content to improve and integrate information and content into an existing body of knowledge while understanding how copyright and licenses are to be applied. To know how to give understandable instructions for a computer system.

3.1. Developing digital content
To create and edit digital content in different formats, to express oneself through digital means.

3.2. Integrating and re-elaborating digital content
To modify, refine, improve and integrate information and content into an existing body of knowledge to create new, original andrelevant content and knowledge.

3.3. Copyright and licenses
To understand how copyright and license apply to data, information and digital content.

3.4. Programming
To plan and develop a sequence of understandable instructions for a computing system to solve a given problem or perform a specific task.

The fourth area "Safety" is composed by 4 competences:

4. Safety
To protect devices, content, personal data and privacy in digital environments. To protect physical and psychological health, and to be aware of digital technologies for social well-being and social inclusion. To be aware of the environmental impact of digital technologies and their use.

4.1. Protecting devices
To protect devices and digital content, and to understand risks and threats in digital environments. To know about safety and security measures and to have due regard to reliability and privacy.



4.2. Protecting personal data and privacy

To protect personal data and privacy in digital environments. To understand how to use and share personally identifiable information while being able to protect oneself and others from damages. To understand that digital services use a "Privacy policy" to inform how personal data is used.

4.3. Protecting health and well-being

To be able to avoid health-risks and threats to physical and psychological well-being while using digital technologies. To be able to protect oneself and others from possible dangers in digital environments (e.g. cyber bullying). To be aware of digital technologies for social well-being and social inclusion.

4.4. Protecting the environment

To be aware of the environmental impact of digital technologies and their use. **As well as the last area is composed by 4 competences:**

5. Problem solving

To identify needs and problems, and to resolve conceptual problems and problem situations in digital environments. To use digital tools to innovate processes and products. To keep up-to-date with the digital evolution.

5.1. Solving technical problems

To identify technical problems when operating devices and using digital environments, and to solve them (from trouble-shooting to solving more complex problems).

5.2. Identifying needs and technological responses

To assess needs and to identify, evaluate, select and use digital tools and possible technological responses to solve them. To adjust and customize digital environments to personal needs (e.g. accessibility).

5.3. Creatively using digital technologies

To use digital tools and technologies to create knowledge and to innovate processes and products. To engage individually and collectively in cognitive processing to understand and resolve conceptual problems and problem situations in digital environments.

5.4. Identifying digital competence gaps

To understand where one's own digital competence needs to be improved or updated. To be able to support others with their digital competence development. To seek opportunities for self-development and to keep up-to-date with the digital evolution.



2.2.3 How to use the framework

Using the European Digital Competence Framework has transformed the world. The DigComp framework has been endorsed by EU Member States representatives in the Education and Training 2020 Programme Thematic Working group on "ICT and Education". Several Member States already use DigComp in different ways and it also has various European-wide implementations.

The DigComp framework has been well received and taken up by various stakeholders. This versatile instrument is used for various purposes. In this section, we categorize three different uses the framework can have in the context of education, training and employment as follows:

1. Policy formulation and support: is one of the purposes of DigComp use at the national and regional level.
2. Instructional planning for education, training and employment: it has mostly been taken up to develop education and training initiatives for education, skills and employment purposes.
3. Assessment and certification: it constitutes one of the most visible areas of all DigComp implementations.

Various stakeholders have operationalized DigComp as a publicly and freely used tool.

The stakeholders range from policy makers, educational and employment authorities at national and regional levels to public and private training institutions and the third sector bodies, which provide education and training opportunities.

In an attempt to share practices and offer opportunities for peer learning around the implementation of DigComp, in 2015 an "Implementation Gallery" was launched on the JRC Science Hub website 20. The Implementation Gallery works on the self- reporting principle and presents snapshots of the implementations at a given moment in time. The goal is to display examples of use across Europe. These should not be regarded, by definition, as best practices.

2.3 Common areas shared between the frameworks

According the Council of EU[8] key competences are those which all individuals need for personal fulfilment and development, employability, social inclusion, sustainable lifestyle, successful life in peaceful societies, health-conscious life management and active citizen ship. They are developed in a lifelong learning perspective. The key competences are all considered equally important; each of them contributes to a successful life in society.

Competences can be applied in many different contexts and in a variety of combinations. They overlap and interlock; aspects essential to one domain will support competence in another. Skills such as critical thinking, problem solving, team work, communication and negotiation skills, analytical skills, creativity, and intercultural skills are embedded throughout the key competences. The Reference Framework sets out eight key competences. Digital Competence and Entrepreneurship competence are two of them.

In EntreComp, Entrepreneurship is understood as a transversal key competence applicable by individuals and groups, including existing organisations, across all spheres of life. Same, in DigComp, the Digital competence is also understood as a key transversal competence.

Transversal skills and competences (TSCs)[9] are learned and proven abilities which are commonly seen as necessary or valuable for effective action in virtually any kind of work, learning or life activity. They are 'transversal' because they are not exclusively related to any particular context (job, occupation, academic discipline, civic or community engagement, occupational sector, group of occupational sectors, etc.).

The 2020 Communication - European Skills Agenda[10] for sustainable competitiveness, social fairness and resilience updated the 2016 New Skills Agenda[11] , highlights the need for a paradigm shift in skills to drive the twin digital and green transitions and ensure recovery from the socio-economic impact of the COVID-19 pandemic and the Commission will foster transversal skills by providing a strategic framework for their recognition, develop resources to support validation of transversal skills by employers and employment services and to support validation practitioners in Europe.



For both Competence Frameworks the common areas include the use of a variety of learning approaches and contexts, support for teachers and other educational staff; assessment and validation of competence development as well as support for strategic policy-making in the above issues. Some examples are presented below.

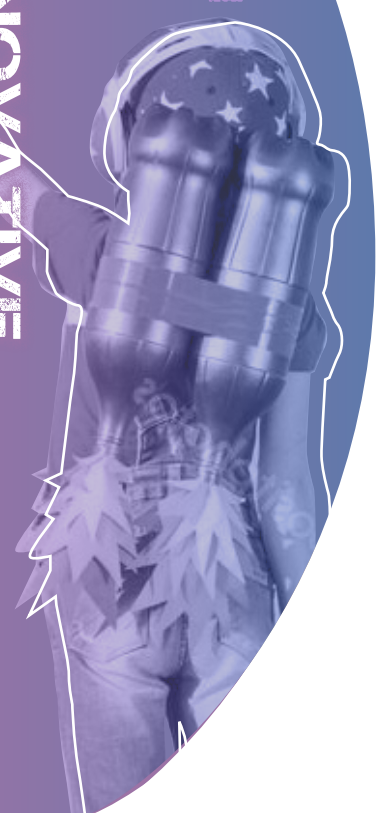
As stated in the EC Stakeholder Update[12] the development of the use of DigComp goes within processes to support upskilling of people working in different economic sectors same as exploration of use of EntreComp goes in work-based settings to support professional development and upskilling of adults. Another common area is how digital credential systems (e.g. open badges or other) could complement both EntreComp and DigComp to support competence development.

Another example is the use of DigComp and EntreComp in combination to support organisational change. Since change management is first and foremost about people, the combination of the two models could support not only specific digital transformation projects but also overall transformation processes in organisations in today's digital age. Vision, creativity, leadership, planning and digital competencies are a combination of skills that can help manage change and support businesses and organizations against the new problems of the modern era.

One more example, is the support they can provide in combination to integrate aspirations of the UN Sustainable Development Goals (SDG) and in particular (but not exclusively) within the SDG4.7, into education, training, learning and employment (including enterprise creation).

8 Council Recommendation of 22 May 2018 on key competences for lifelong learning (Text with EEA relevance.), Document 32018H0604(01) ST/9009/2018/INIT
9 Noack, M., 2021, Unpacking transversal skills and competences: Towards lifelong learning, Cedefop. https://www.cedefop.europa.eu/files/210629_unpacking-transversal-skills_noack.pdf
10 European Commission (2020), Accompanying the document Communication to the European Parliament, the Council, the European Economic and Social Committee and the Committee of Regions on achieving the European Education Area by 2025.
11 European Commission (2016). European Skills Agenda for sustainable competitiveness, social fairness and resilience. Luxembourg: Office for Official Publications of the European Communities.
12 https://ec.europa.eu/social/BlobServlet?docId=18864&langId=en, [Accessed 5 April 2022].

3 INNOVATIVE METHODOLOGIES IN HIGHER EDUCATION



Higher education in the EHEA is moving through transformation models of formative moments. Especially in terms of the digital transformation of the entire educational group that makes it up.

The chosen methodologies used for training then acquire great importance if they favor the active role of the student and their autonomy. The Entrepreneurial Competency Framework is one of the tools that can be integrated into this methodological transformation so that the recipients can benefit from the learning it introduces.

For students to acquire the essential knowledge and skills to function in the social and professional world, it is necessary that teaching begins to be centered on the student and not on the teachers or the content.

The entire methodological set that can be encompassed under the umbrella of the denomination of "active methodologies" is useful in this function.

They are considered within these methodologies:

Case analysis, a methodology that is characterized by being a superficial analysis of a feasible situation that recreates the conditions of the work environment of the future professional, it can be in written or audiovisual format.

Problem-based learning is a methodology that assumes problems as a starting point for the acquisition and integration of learning; It allows them to face the problem situations of daily life and their work.

The inverted classroom, a methodology that reverses the order of a traditional class, the presentation of the content is carried out before the class by brief audiovisual explanations, they carry out the autonomous work before the session.

Team-based learning seeks to generate learning through the cohesive work of heterogeneous groups, those who are achieving greater degrees of autonomy with those who need more support.

Learning and service, which is based on the integration between learning based on experience and service that contributes to providing real solutions to a community problem.

To implement this change successfully, it is necessary to know the active methodologies, what learning is like today and the use of information and communication technologies (ICT).

With active methodologies, we understand the methods, techniques and strategies that the teacher uses to turn the teaching process into dynamics that favor participation, leading to learning, focusing more on the framework of the activity than on the content.

As advantages could be highlighted being motivating, developing the ability to analyze and synthesize and allow the content to be more meaningful for students. Success resides in the teacher being able to carry out these methods correctly, leaving room for reflection and debate.

3.1 Design and planning of Technology based social and educational projects

As we will see later, Design Thinking is a way of thinking applied to a work methodology; focuses on finding solutions to problems that may arise. For this, it is necessary to know them in depth; aims to identify the needs to solve them.

To carry out a process through Design Thinking, it is necessary to follow a series of phases:

Empathize: it is the first stage of the process and the basis of this; we define the user to whom we are going to go and establish the research objectives; From here, it is decided which techniques are going to be used to collect information.

It aims to identify wants and needs.

Define: all the information that has been collected is organized in order to identify all the areas of opportunity from which we can offer solutions for the wishes and needs of the user. The most widely used technique is clustering, that is, putting the information on post-its that will be grouped by content and that synthesize the information.

Ideate: once the need for which we are going to find a solution has been identified, we proceed to look for it. It will be necessary to propose the greatest number of ideas that respond to the challenge, there will be a brainstorming that will help us to find as many as possible.

Prototyping: some of the proposed ideas are chosen and they are prototyped, that is, we shape the ideas so that we can show them to the user so that they can show their opinion about it andw know if we are attending to their needs and desires.

Validation: when the prototype is shown to the user, it is important that we understand that it is not being sold, but we want to know if it meets their needs. It is about receiving feedback to make an improved version of the solution.



Design Thinking

It is a method to generate innovative ideas that focuses its effectiveness on understanding and solving the real needs of users; It comes from the way product designers work and the human being is always the center of attention.

It is used to solve problems in a creative and innovative way, to design and develop products or services, redesign business processes, start and create companies or create business presentations, among others.

Its process is fundamentally composed of:

The generation of empathy: we must understand the problems, needs and desires of the users involved in the solution we are looking for. Teamwork, since it values the ability of individuals to contribute uniqueness.

The generation of prototypes, since it defends that every idea must be validated before it is assumed to be correct. All this under an atmosphere in which playfulness is promoted. It's about enjoying the process; During this, techniques with a great visual and plastic content are developed, it makes us put both our creative and analytical minds to work, resulting in innovative and feasible solutions.

We must consider the materials that are going to be used, the equipment with which we are going to work, the space we are going to have and have a good attitude, we must be curious and observant, optimistic and positive.

Design Thinking is a powerful tool in the design of products and services. Therefore, you can use it as an entrepreneur to quickly advance your project. Another advantage that it will bring you will be to quickly generate proposals that connect with the user. In a second phase, you can shape them and turn them into business models, based on the product or service you are designing.

In October 2020, FUTURE has received the special award for an innovative social platform at the annual Computer Space (international computer art forum) and has been recognized as a best practice for social emotional learning.

A facilitator must have the following characteristics:

Listening skills: they can see what is happening in the group in order to act from that point; He must be able to create the environment that he deems necessary and must measure time and provide the group with what it needs to function better.

Detachment from their own opinions: their job is not to provide solutions, but to empower the group so that they get the best solutions. If you gave your own opinion, you would create insecurities among the members of the group and would nullify your own initiative.

Friendliness and good disposition: you must create a suitable work environment where all participants feel heard and important; You must be attentive and involved.



3.3 Gamification

The complexity and speed of technological and digital advancements is changing (also) the way young people engage towards a learning path. In an educational ecosystem where students lack attention, involvement and motivation, gamification helps motivate them and make them more engaged with the subject matter.

The idea of incentivizing people is not new, but the term "gamification" didn't enter the mainstream vocabulary until 2010. Only a year later it became a viable trend. In general terms, gamification consists in the use of game-design elements and game principles in non-game contexts. For example, in-game principles and themes such as acquiring virtual points or other currency, and completing series of tasks or activities to advance to the next level, may be used in contexts other than gaming (e.g. education) to provide fun and stimulation for the learner. It makes it possible to increase self-motivation and to generate creativity, interest and joyful emotions. It creates the feeling of blissful and satisfying productivity and focus on achievable goals, thus giving better prospects for success. Games have the strength to give rewards when most needed by the player.

There is a vast variety of gamified learning approaches. They differ in the effort invested in their development; the learning objectives to be achieved; the thematic spectrum to be dealt with; the target group to be addressed and supported; the learning methods to be used; the degree or extent of the time taken to process them; the location or situation of their use (school, university, vocational guidance, training, offline, online), etc.

Gamified learning can be implemented digitally or traditionally, indoor or outdoor, can be played by individuals or groups, pursued competitively or cooperatively, requiring an active or passive role, practical work or reflection... All these methods can be implemented in a variety of ways. In principle, five game types can be differentiated for competence development:



Simulation, Adventure, Role-Play, Strategy and Quiz:

It is a learning technique that transfers the mechanics of the game to the educational-professional field in order to achieve better results, to better absorb knowledge, improve skills or reward specific actions. In other words, it is a learning technique that transfers the potential of games to the classroom in order to improve results.

This type of learning facilitates the meaningful learning of knowledge and facilitates the internalization of content, achieving a positive experience. This model works because it motivates students and creates commitment and encourages improvement, improves logic and strategies to solve problems, and also adapts to the level of difficulty that is necessary and increases attention and concentration.

The mechanical technique is the way to reward the user based on the objectives achieved, some of the most used are:

- **Accumulation of points: assigning a quantitative value to certain actions and that they accumulate as they are carried out.**
- **Level escalation: define levels that the user must overcome to reach the next one.**
- **Obtaining prizes: as they are obtained, prizes are awarded as a collection.**
- **Gifts - Goods that are given to the player for free upon achieving an objective.**
- **Classifications: classify users based on points or objectives achieved, highlighting the best in a ranking.**
- **Challenges: competitions between participants, awarding points.**
- **Missions or challenges: solve or overcome a challenge or objective.**

Dynamic techniques refer to the user's motivation to play and achieve their goals. Depending on the dynamics, some mechanical techniques or others should be exploited more. The most used are:

- **Reward: obtain a benefit.**
- **Status: establish a hierarchy based on the objectives achieved.**
- **Achievement: personal improvement or satisfaction.**
- **Competition: try to be better than others.**

Another positive point is that it encourages the use of new technologies, which is why ICTs are usually used because they allow adaptation to the different levels and subjects taught in the classrooms. As resources we have multiple tools such as Edmodo, Elever or Kahoot.



There are many proven benefits to using gamification in the classroom, such as:

- **Students feel like they have ownership over their learning.**
- **A more relaxed atmosphere in regards to failure, since learners can simply try again.**
- **More fun in the classroom.**
- **Learning becomes visible through progress indicators.**
- **Students may uncover an intrinsic motivation for learning.**
- **Students can explore different identities through different avatars or characters.**
- **Students often are more comfortable in gaming environments, so are more proactive and open to making mistakes.**
- **Higher engagement and concentration levels amongst students.**
- **The opportunity to think outside of the box. Tasks are no longer just about filling in a worksheet – what are the wider, 'gamified' consequences?.**

Here are a couple of examples representing the convergence between gamification techniques and learning objectives:

1. The "GAMIFICATION - ICT to Play and Play to Learn" project (agreement n. 2016-2-ES02-KA205-008528) is an Erasmus+ Strategic partnership, run from 2016 to 2018 by a European consortium made up of organisations active in the field of education and training. The objective was to train professionals and youth workers in the use of non-formal education tools around the implementation of a gamified approach, understanding this as the use of gaming techniques in recreational environments and also non-playful applications in order to enhance motivation, concentration, effort, loyalty and other positive values.

2. In October 2020, FUTURE has received the special award for an innovative social platform at the annual Computer Space (international computer art forum) and has been recognized as a best practice for social emotional learning.



Other innovative Methodologies for Entrecomp and Digcomp competences acquisition

To promote teamwork and improve the quality of learning, other methodologies are used to prepare the student for the real situations they will encounter in life. These methodologies are based on play, cooperation, problem solving, creating projects and fostering critical thinking.

This form of learning assumes an active role in the students, which allows them to have greater participation and it is they who find solutions to the problems that are proposed or arise. It favors the student's autonomy, motivation and the acquisition of new skills in individual and team work.

Some of these methodologies are:

Flipped Classrom: a pedagogical model in which the traditional elements of the lesson given by the teacher are inverted; the materials are studied at home and worked in the classroom. With this, it is possible to optimize the time in class for the development of projects and the possibility of meeting the needs of each student.

Project-based learning: allows students to acquire knowledge and skills through the development of projects that respond to real-life problems; they start from a specific problem and try to find a solution for it; In this way, they develop skills such as critical thinking, collaboration or communication.

Cooperative learning: it is used to group students in such a way that, by working as a team, they improve the attention, involvement and acquisition of knowledge by the students. Each member has a role and to achieve the objectives it is necessary to work in a coordinated manner; as the end goal is common, each one will have to achieve their individual goals to achieve the collective.

Problem-based learning: it is a cyclical learning process that begins with questions that are increasingly complex; This means researching and obtaining useful data. With this methodology we can develop critical thinking, problem solving, increase motivation and improve the ability to transfer knowledge to new situations.

Thought-based learning: with this type of methodologies, students are taught to work with the information they receive, that is, to contextualize it, analyze it and turn it into knowledge. It aims to develop thinking skills beyond memorization.

Competency-based learning: its objective is the acquisition of knowledge, the development of skills and the solidification of work habits; It allows teachers to teach the work plan by approaching it in a different way, so that real examples are put into practice.

3.4.1 What does "Hackathon" mean?

On the other hand, another more concrete example is a hackathon, a fusion between "hacking" (solving technical problems in an innovative way) and "marathon". These events are attended to work with the goal of creating a useful product or idea. They are usually focused on a specific theme that influences the participants, but gives freedom to creativity.

It is a work system that allows all participants to influence the project in a notable and active way; since, each one will offer their solutions or approaches to a common project and the final product will be as elaborate as possible.

A hackathon is an intensive and immersive experience of agile prototyping and technological solutions in a contest format and in a limited time. At the same time, it is also an event in which groups of people interested in a problem or issue raised, which acts as a common thread, propose and design prototypes that provide solutions to the hypotheses raised, share knowledge and attend innovation workshops related to the Hackathon theme. The term hackathon comes from mixing "hack" with "marathon". Its roots in the term "hack" is due to the fact that at first they were meetings designed for experts in technological development. And its fusion with "marathon" is due to the fact that these meetings were designed with the playful aspect of getting a prototype or a "hack" in a limited time. At a hackathon, you can go to participate in the contest, for which you have to be willing to be part of one of the teams that will be created at the event itself.

The participants will be integrated into the teams and adopt the necessary roles to carry out the development of the idea and its demonstration prototype in the allotted time. At the end of the event, the teams present their ideas, prototypes and developments to a jury.

Other ways of participating can be to go to learn from the rest of the participants, to teach the rest what you can contribute the most or merely to give ideas that respond to the needs of the chosen topic.

Ultimately, the hackathon will also be a meeting point for designers, entrepreneurs, activists, creatives, experts in marketing and communication, businessmen, and citizens in general with a curiosity to learn, participate and learn new things, always supported by experts in development and technology.

In this open and collaborative climate, powerful synergies arise that lead from creating mobile applications to creating the embryo of what a future technology startup can be. And in any case, they serve as a training experience in many aspects for all attendees, and for the creation and exchange of experiences, which usually results in the creation of new (or the strengthening of already existing) networks of knowledge and people.

3.4.1 What does "Hackatho

The hackathon follows a process:

Introduction and scope of the tasks: the participants receive information on the schedules and activities, to later receive it on the topic and the problem statement. The groups should start working after it.

Identification of needs and problems: the search field must be analyzed to find the problems and needs that users have already perceived on the subject.

Conferences: group workshops are given in which the topic of the event is discussed to offer useful information to the groups.

Information booths: Companies promote these events to present themselves as employers and find new talent.

Pitches: this is the time when participants suggest ideas for projects they would like to work on.

Teamwork: teams are usually spontaneous, so there will be participants with different levels of knowledge about the subject; This will make the approaches very different from each other and a project can be pushed forward quickly.

Development work: brainstorming is done to collect strategies and solutions to the problem. It is time to start with the prototype.

Presentation: it is the moment in which the solution they have found to the problem is presented, it is not a final presentation, but an intermediate one in which they announce the status of the prototype; in this way, they can receive advice from the other participants.

Ceremony: the ideas and the final prototype are presented and the winning team is decided.

It is a good way to meet people with the same interests and share experiences; teamwork is encouraged and programming skills are discovered. In addition, it is an opportunity to share presentations with professionals from the world of new technologies, which allows you to learn from them and expose yourself to new job opportunities. It allows to learn, innovate and demonstrate skills; allows you to learn to stay calm, being as productive as possible. It allows you to discover the achievement, not only in a group, but also individually.

3.5

Educational Technology & Technological Education

Educational technology refers to the area of technology dedicated to the development and application of tools (software, hardware and processes), it is focused on promoting and improving education. It is the study and practice of facilitating learning and putting into practice the creation, use and administration of technological resources.

There are great programmers who are able to create the data-focused processes and applications that facilitate learning, but they cannot replace teachers when it comes to teaching knowledge. At the same time, educators are not prepared to use this technology in their discipline.

This is developed and implemented so that the processes that require the most time are simple processes to facilitate communication. The correct use of these tools can have a future social impact on all aspects of society; allow students and teachers to focus on learning and improving educational quality.

This arises due to the need to use in the most complete and profound way the psychological and personal characteristics of the students during the teaching process; due to the need to replace the old teaching methods with modern and effective ones, and due to the need to design the educational process with the interaction between the teacher and the student.

The characteristics of educational technology are:

Conceptuality: serves as the basis for a specific scientific concept that, in turn, serves as the basis for technology.

Integrity: refers to the interrelation of the components of educational technology.

Control: possibility of modifying the objectives and monitoring the educational process, in addition to correcting it.

Reproduction: be used by different teachers, due to the ability to have replicas.

Efficiency: achieve educational goals reducing costs of money and time.

It is represented by interconnected components that are: the conceptual framework, the content that defines the objectives and the procedural part (methods and means of the teacher's work).



Person-oriented educational technology: it refers to self-education, that is, it implies that the student wants to acquire knowledge, skills and develop their potential. The elements of learning are presented in levels, playful learning methods are important and the use of dialogue is essential.

Modular learning technology: it is based on the individual needs of each student, creating modules that meet their abilities; that is, it is based on the student being the most important element. The knowledge is divided into blocks and a study time is estimated that marks the final objective.

Problem-based learning technology: it is learning through the search for solutions to problems; In this way, the teaching material is mastered and practical skills and abilities are acquired. The teacher does not provide all the material, but guides the students to find and master it.

Playful learning technology: its main objective is to stimulate cognitive activity by developing an interest in learning; play is as important as knowledge.

Computer training technology: the learning process is carried out through the use of computers and other means; which makes it not only modern but interesting. There are two variants: programmed training (using a device programmed with the material) or distance learning (distribution of information for individual use of it).

In relation to this, we have technological education, that is, the teaching of technology. At present, learning about technology is still not culturally accepted, because it is seen as something with which young people are incorporated into citizenship.

There are two ways of understanding technology:

the common sense, understanding it as something of little use; and the most restricted, the one based on aspects related to engineering. The purpose of a good technology education is to prepare citizens to participate in sociotechnological decisions and reduce the technology gap.

However, although technology has always been something linked to education, there is a big problem: most teachers and students have difficulty using technology:

For this reason, technology teaching should be part of compulsory education; However, they seem to encounter multiple problems with which this can be carried out: difficulty in developing the syllabi and the shortage of trained teachers, equipment and available spaces and the little maturity reached towards technology.



The approach to technology is intended to train workers for the technology industry, it only focuses on problems such as technological products and processes. The alternative on technology aims to highlight the cultural and organizational aspects of technology; guide the teaching of technology to any field regardless of whether it is scientific or not. The technology approach aims to provide initial training as technologists.

Both technology and applications seek to connect science with real, everyday problems, but to a greater extent, the teachings of technology do not refer to it, but rather it is treated as something superficial.

3.6 Open Source and Open Access Technology

Open source technology refers to open source software (OSS), a code that is designed in a way that is accessible to anyone and allows them to view, modify and distribute based on their needs.

It is developed through collaborations, so it relies on peer review and community production; It is more accessible and durable than other alternatives because it does not depend only on one company. It became a way of working that looks for new ways to solve problems.

Its appearance is linked to the appearance of the internet, to create it, they made a cooperative and open research environment so that they could review it among themselves; some shared the source code and the rest were based on it. Its use is basically in developing software systems that can be modified later by other people. It has a series of features that make it increasingly popular and a good option for creating custom software:

Peer review: allows you to access the source code to verify and improve the code.
Transparency: allows anyone to access information and track it without relying on intermediaries.
Reliability: It is constantly updated and the programmers guarantee that it is evaluated on a regular basis.
Flexibility: can be used to address business or community issues; since it has no specific use, multiple solutions can be created.
Lower cost: the code is free, when a company uses it, it pays for support and security reinforcement.
Without depending on a single provider: it can be moved anywhere and used at any time.
Open collaboration: allows you to seek help, resources and points of view that transcend the interest of a group or company. Open source technology refers to open source software (OSS), a code that is designed in a way that is accessible to anyone and allows them to view, modify and distribute based on their needs.



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Without depending on a single provider: it can be moved anywhere and used at any time.
Open collaboration: allows you to seek help, resources and points of view that transcend the interest of a group or company.

On the other hand, it also has a series of disadvantages such as: it does not have a claim office and may stop having improvements if it is not supported by a community.

There is also open access technology, that is, free access to information and the unrestricted use of digital resources by anyone. Any type of digital content can be published through open access; texts, software, video and audio supports ... It can be applied to non-academic content.

A publication can be disseminated in open access if:

- **It is possible to access the content freely and universally, without any cost through any medium.**
- **The person who owns the copyright to the content irrevocably grants users the right to use, copy or distribute the content.**
- **The original and total version of the content is deposited in an appropriate electronic format.**
- **In addition, it improves the speed, effectiveness and efficiency of research, it is a factor that favors research; increases visibility and makes it possible for other people to make use of that information.**

3.7

Netiquette, cybersecurity, licensing and behaviour in digital environments.

Netiquettes with a set of rules of coexistence on the Internet that everyone who uses it must take into account, are based on respect for others by adapting daily behavior to the Internet.

The virtual world is a real environment where you have the opportunity to contact other people, taking advantage of Internet resources.

It is, therefore, a kind of protocol that must be followed when establishing an electronic contact; in order for communication to be adequate. Social networks, email, blogs or forums are governed by these rules.

To make proper use, therethis set of rules:

- **All rules of coexistence of real life, apply online (respect, good behavior, proper use of vocabulary ...) not send spam or notifications that can reach disturb.**
- **Carry out digital citizenship, if you witness someone being harassed or in danger, report these events. Leave room for the rest.**
- **Avoid viruses, they could arrive in the form of spam or links to dangerous places to other contacts. Avoid writing the entire message in capital letters because it is equivalent to yelling at the other person.**

Cybersecurity is the practice of protecting computers, servers, mobile devices, electronic systems, networks, and data from potential threats. It can be applied from business to mobile computing, it is divided into:

- **Network security: protecting a computer network from intruders.**
- **Application security: keep software and devices free from threats.**
- **Information security: protects the integrity and privacy of data, during storage and during transit.**
- **Operational security: processes and decisions to manage and protect data resources.**
- **Disaster recovery: defines the way in which an organization responds to a cybersecurity problem.**
- **End-user training: is responsible for teaching people how to use data correctly to avoid viruses or threats.**



Cyber threats are increasingly widespread, causing damage and leaking data from both users and companies and creating serious security damage. The types of cyberthreats are:

- **Cybercrime: individual agents or groups that attack systems for financial gain or cause disruption.**
- **Cyberattacks: involve the collection of information for political purposes.**
- **Cyberterrorism: aims to weaken electronic systems to cause fear.**

In turn, there are different methods to threaten cybersecurity such as:

Malware: refers to malicious software, it is one of the most common forms and it manifests itself by interrupting or damaging the user's computer. It is usually spread via an unsolicited email attachment or download. **Among these are:**

Viruses: a program capable of being reproduced, is embedded in a file and spreads throughout the computer system.

Trojans: looks like software, they trick users into downloading them and causing damage to their computers or stealing data.

Spyware: records the use that the user makes with their device to use that information.

Ransomware: locks a user's files and data to threaten to delete them.

Adware: Used to spread Malware.

Botnets: Malware computer networks used to perform tasks without user permission.

SQL code injection: consists of taking control and stealing the data from a database, in this way they access confidential information.

Phishing: It is based on attacking users with emails that appear to be from a company to request confidential information.

Attack of type "Man in the middle": consists of intercepting the communication between two users to steal data.

Denial of service attack: It consists of overloading networks and servers to render computer systems unusable.



As recommendations to protect yourself from these attacks:

- **Update the software and operating system**
- **Use antivirus**
- **Use strong passwords**
- **Do not open email attachments from unknown senders**
- **Do not click on links in emails from unknown senders or websites**
- **Avoid using unsecured Wi-Fi networks in public places**

To protect all the information that we upload to the networks, there is copyright. In order to use that information, there are licenses; that is, the authorization that the content author gives to other people about what they can or cannot do with that content that that person has published.

Among the different types of licenses we find:

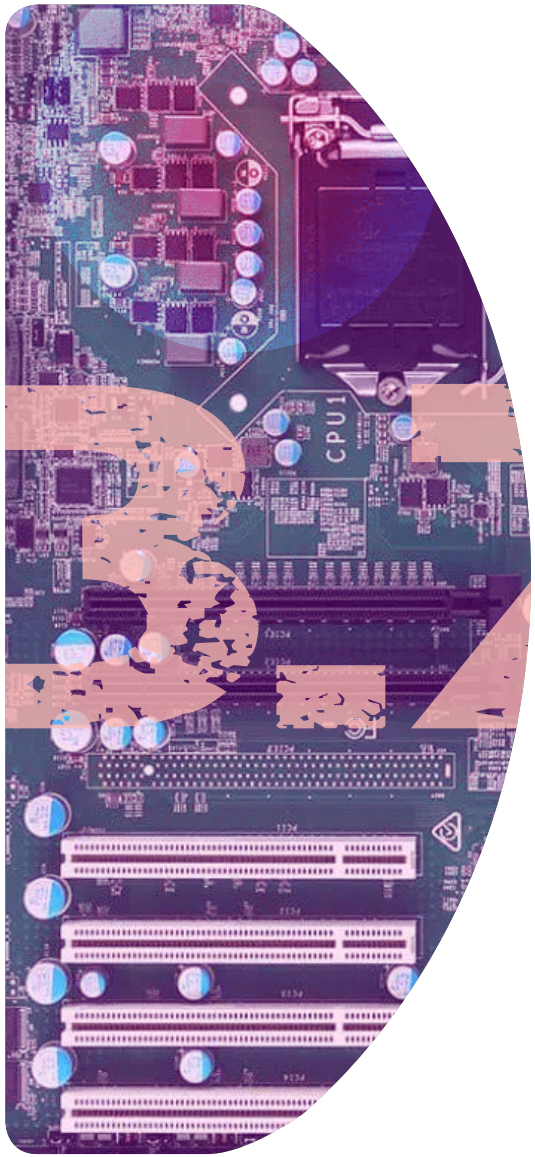
Copyright: It is a digital use license that protects copyright, allows the author to decide on the conditions in which their works can be distributed and reproduced. If a third party wishes to use it, authorization is essential Author's authorization for that specific purpose, and usually payment for its use. Any content available on the Internet that does not specify a type of license, is automatically protected by Copyright, although it can be used, with limitations, for educational purposes or in news.

Copyleft: It is a group of licenses whose objective is to guarantee that each person who receives a copy of a content can make use of it, modify it and distribute the work itself and its derived versions.sometimes

Commercial use of such works ispermitted. You acknowledge copyright, but give free use of the content.

Within this we find:

CreativeCommons: This is an organization that allows the use and sharing of digital content through a series of free guidelines. Therefore, it recognizes the copyrights but some are reserved. CreativeCommons distinguishes between six different licenses:





Attribution CC-BY: allows all types of use of the content.



Attribution-Non-commercial CC BY-NC: prohibits commercial.



Non-commercial - Share Alike CCBY-NC-SA: prohibits the commercial use of the content and possible derivative works.



Non-Commercial - No Derivative Work: Prohibits commercial use and creation of derivative works.



Attribution Share-alike CC BY-SA: it is mandatory to share the new resource generated with the same licenses as the original one for any type of destination use.



Non-derivatives CC BY-ND: Commercial use its allowed but without any kind of modification.

GNU GPL: It is used in the field of computer software, any software that uses this type of licenses is declared as free software. This means that anyone can install this software, modify its code, or distribute it without the express permission of the author.

Framework of Entrepreneurship Competences in Higher Education

We propose:

- Methodology **Direct action** to be implemented in the classroom.
- Proposal **Theoretical and practical work**. We learn by doing.
- **Meaningful learning** and project-based.
- **Didactic sequence** that accompanies the development of the entrepreneurship proposal.
- It helps the participating students to acquire in a practical and dynamic way the **entrepreneurial skills established by** the European Commission in the Application Framework.

We accompany the group in the entrepreneurial process

Supported by the experience of using agile methodologies and Design Thinking techniques, we provide a didactic sequence, as well as practical activities, which allow you to develop an entrepreneurial project or proposal from scratch.

You can expand or condense the process, although the recommendation is to dedicate the time set so that the proposals and contents between steps are established and mature properly.

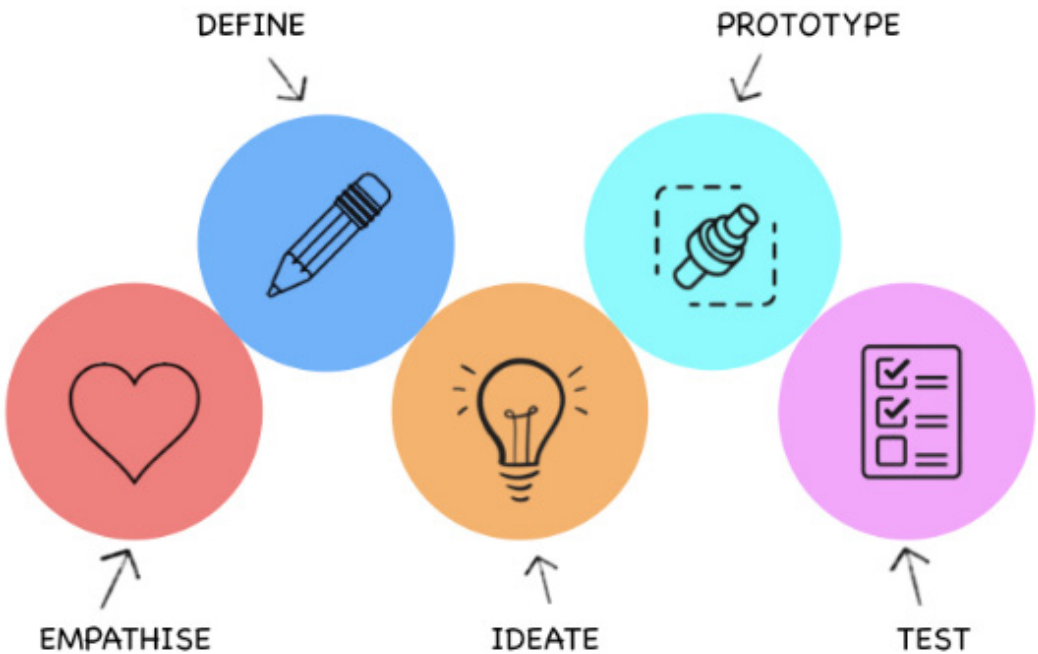
In many cases, it is necessary to externally contrast or validate the content, so these spaces between activity and activity allow for more feedback and improve the idea.



Design Thinking

Is the basis of the proposal. Empathize, Define, Devise, Prototype and Validate, are still present in the different moments of the proposed sequence.

The proposed didactic sequence also hyabridizes with other innovative methodologies, as well as with specifically created and adapted activities.

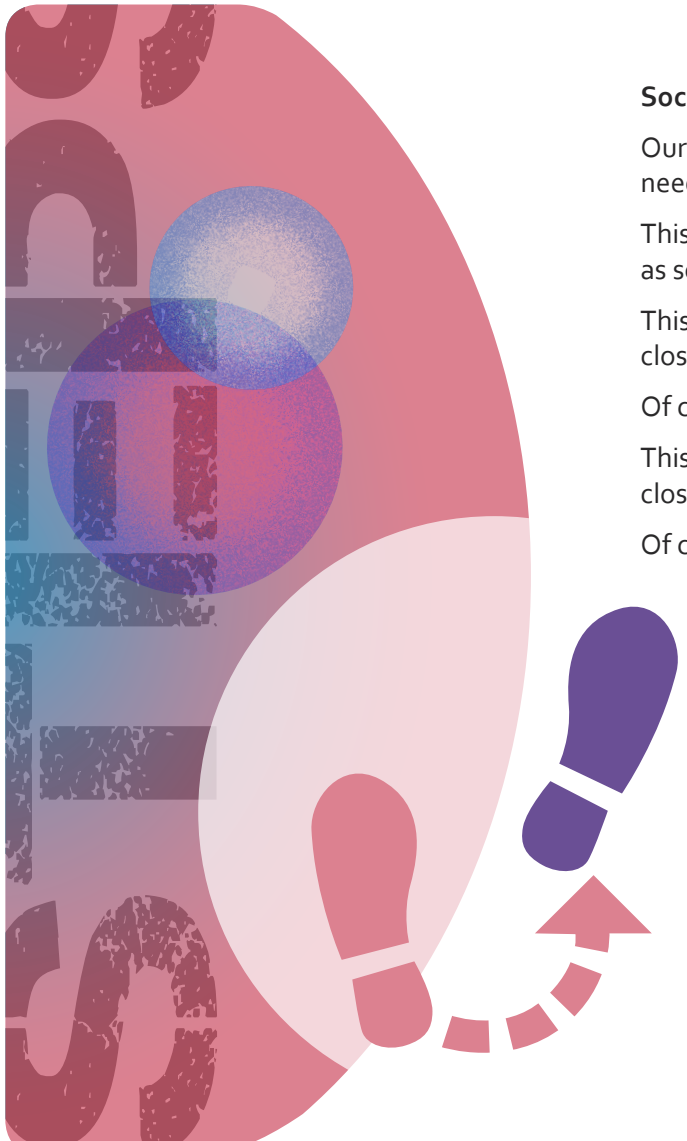


Typology of projects

People at the center of the process

It is the basis of Design Thinking, the project methodology on which this proposal is inspired.

In this case, by being framed within a classroom project, with students, and an educational nature. People are doubly at the center of the process, both who will be beneficiaries or users of the projects, and the students who receive learning from the process. Everything is thought and designed around their educational and learning needs.



Social Approach in the center itself

Our proposal contributes to generating entrepreneurs with a social conscience, directing projects to solve problems or needs of people close to the student body.

This approach contributes directly to facilitating the process and motivating students, who experience the problem or need as something close.

This contributes to making them feel more involved in the proposal and helps to carry out the context analysis part that is closer to their realities.

Of course, the start-up is more viable if we have a close environment to apply.

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Steps proposed in the didactic sequence

1.- Analyze the context
2.- Detect the need
3.- Generate ideas
4.- Validate and contrast the idea
5.- Generate the hypothesis of change
6.- Prototype the idea
7.- Prototyping
8.- Test
9.- Validate the PMV
10. Make it Real

4.1

1. ANALYZE DE CO

Instructional Activities for the project: designing, implementation and results collecting

Following the 10 steps sequence we propose you some tools and activities to complete each step and provide participants with the competence acquisition required in order to complete the Entrepreneurial competence Acquisition.

1. ANALYZE DE CONTEXT

Objective

Explore problems of the daily life of the people in our environment (near or far). Get closer to the problem on which to raise an answer.

Before defining the idea, or the problem we want to work on, we are going to know, through people like each participant, situations of daily life that will help us to identify possible focuses for the presentation of proposals.

Duration time:

45' to 60'

Competences:

- Opportunity search
- Ethical and sustainable thinking

Group work sequence:

Present the activity, the objective, and the framework.

Ask for a first individual task, in which they enter their social networks, identify a problem or a need of one of their followers that has caught their attention.

Ask them to define in 3 post-its: What is the problem, how does it affect the person. What profile of person is it.

Ask for a quick read of the information. You can put together those that have the same work area, a common profile, the same type of affected people, etc.

Organize working groups of between 4 and 5 participants. They are invited to share the information sought individually and group it into a single concept. Is the whole team interested or does the whole team want to work on this element? Yes, cool.



No, you can change groups or redefine the concept.

Once the groups have been closed and the first concepts defined, we are going to carry out a second part of the activity that will help us to position the participants in relation to the problem or need - we have asked from their own social networks and the information they see and they consume regularly to generate greater proximity and empathy with the project to be developed.

The second part must be done with researching and collecting information that helps to better measure and understand the starting situation.

To do this, we ask each group to look for at least 5 news stories in different media that address the issue. We obtain the first data, first information, stories, testimonies, etc.

They must collect the information in a way that allows it to be stored and used later. In the same way, and to help share and make it more visual, they can use the continuous paper to capture the information and teach it and share it with the rest of the group so that they can add or complement information.

Recommendations

Ask them to add the **press clippings of** the news, the links to the videos, the testimonies found in the networks, etc. Storing this information is very useful for later steps

The use of **manipulative tools or resources** (Lego or Playmobil, plasticine, etc.), can help to generate a clearer narrative of the concepts, serve as a motivator for participants and a catalyst for creativity. For example, recreate the situation on which you are working, one of the news found, etc.

And what's next?

Once the context has been analyzed, it is convenient to delve into it to better understand the interactions between the problem or need and people. In the next phase we are not just going deeper but we will also do a powerful exercise of empathy with the environment and people.

THE FOCUS OF THE PROBLEM

2. DETECT THE NEED

2. DETECT THE NEED

Objective

Determine the focus of the problem to work on. Converge about a first opportunity or need.

Once the context and scope of the proposal have been determined, we are going to define the problem and approach the opportunity.

Duration time:

30' to 45'

Resources needed:

Canvas "Focus of the Problem". Post it. Pens or markers. Optional: Playmobil or Lego.

Competences:

- Opportunity search
- Ethical and sustainable thinking

Group work sequence:

Presents the activity, the objective and the framework.

Organize working groups of between 4 and 5 participants. Spend the first minutes going back to the previous task to refresh the contents and facilitate collaborative group work.

This canvas helps us to link and give coherence to the need, the people affected and the visible effects on this group of people.

Ask the groups to describe, delimitate and detail with the highest possible level of precision:

- the situation or need that want to change
- the affected people or groups of people
- visible effects of the need or problem on people

3. GENERA

BRAIN STORM

To make the activity more dynamic, all activity blocks can be completed at the same time.

We recommend using post-it or similar, which allow you to change and move the information. Likewise, for example, if a group of people described have used green, we can put the effects of the problem on those people with the same color, so visually identifying the different groups of people affected with its effects.

Ask each group to present their work at the end of the session, generating the result to be used in the next activity. Complete description of the problem, people and effects.

Recommendations

Ask them to add drawings and press clippings that represent the content they are working on. The visual impact facilitates and helps to better understand and contextualize the information.

The use of manipulative tools or resources (Lego or Playmobil, plasticine, etc.), can help to generate a clearer narrative of the concepts, serve as a motivating element to the participants and a catalyst for creativity.

And what's next?

Generate ideas that can solve the problem or need detected.

3. GENERATE THE IDEA

Objective

Train the generation of multiple ideas to solve problems or social needs. Generate the first ideas that come close to solving the problem or need.

Once the need has been detected, and after brainstorming, it is time to establish criteria so the ideas you generate are aimed at solving the problem or need.

Duration time:

45' to 60'

Resources needed:

Board. Post it. Pens or markers. Paper.



Competences:

- Search for opportunities
- Ethical and sustainable thinking

Group work sequence:

Presents the activity, the objective and the framework.
Organize working groups of between 4 and 5 participants.
Spend the first few minutes going back to the previous task to refresh the contents and facilitate collaborative group work.

This canvas helps us in an agile and fun way to know the complete cycle of generating ideas for problems or needs. We work on a fictitious assumption, but one that generates continuous parallels with reality, so it is easy to later replicate the final part of the model-

1st Ask each participant to draw on a sheet of paper a person they know very well, put their name, age and as many details as possible. It is very important that they know her VERY WELL. You can put a false name so as not to reveal who it is.

2nd With the drawing done, we are going to do a little research work. What does that person do on a normal day in his life? They must do EVERYDAY, that is to say a minute detail of all the things that person does in a day. VERY IMPORTANT that the detail is maximum.

- He gets up, has breakfast and goes to the institute (NO).
- He wakes up, he stretches. She goes to the bathroom first, turns on the heater, and prepares the laundry. Afterwards, she picks up the bed, while the breakfast warms up. He dresses, leaves the house, but first he looks in the mirror. Take the elevator. You go to the institute by bike, a journey of 10 min. (YES), They may not arrive until the end of the day. It doesn't matter, just having a few hours (3-4) is enough.

2nd THE THEATER PART

The attention of the group is called, and maximum attention is requested. We can put in common some of the daily ones as an example.

"Imagine that each of the people we are working on, when they wake up this morning...

as soon as they have opened their eyes, they notice that a 2-meter-long dinosaur tail has grown on their body and weighs approximately 100 kg"

Take action!

As a group, on the lists and daily life of each one, point out and mark what things they cannot do that they do traditionally, and for what reason.

It is important to define well the why, the reason, the problem, since an erroneous definition implies proposing an erroneous solution or that it does not solve the real problem.

Insist that they only must THINK IN THINGS YOU CAN'T DO AND WHY, STILL NOT THINK OF SOLUTIONS.

It is inevitable, but it is better to define the problems well and then choose the best possible solutions.

Examples:
Cannot dress. Yes, he can, the problem is that the clothes he has he cannot put on.

You can't go to the bathroom. Yes, you can, what you will not be able to is sitting in the toilet or getting in the shower. You can even get into the shower, but it will break the screen, the water will come out, ...

IDEATION

Let each group choose a problem from those that have come out. It is better for each group to choose a different type of problem to have a richer pooling of multiple solutions to a common problem.

We are going to ask you to give 5 different ways to solve the problem. You have to generate an idea and explain what it would be like.

1st IDEA. Make it immediate. That solves the problem in the moment. Eg his pants do not fit and in order not to go down naked to the street, he uses a long sheet to cover his tail. Resolve the problem? OTHERWISE.

2nd IDEA. That they can do it themselves with their knowledge and skills. Eg .. You cannot shower because it breaks things and the water runs out. We help by carrying the tail in our arms and then scrubbing the floor. Resolve the problem? YES / NO

3rd IDEA. That involves the use of technology. Eg so that they do not step on my tail on the street, a motorized system with led position lights. Resolve the problem?

4th IDEA. What would a superhero or superhero do?

5th IDEA. a crazy idea, a freaked out. It is worth inventing things that do not exist. Eg. You cannot access the car to go to work, we invented a flexible system that enlarges or shrinks the size of the car. Or a converter of dinosaur tails, or a system of invisible tails, ...



COMMON POINT

Read the total of ideas. Give room for humor, to twist ideas and proposals ...

Ask the groups to describe, delimitate and detail with the highest possible level of specificity:

- the situation or need that want to change.
- the people or groups of people affected.
- visible effects of the need or problem in people.

What if they are asked to tell it by dramatizing the presentations?

Recommendations

Ask them to add drawings and press clippings that represent the content they are working on. The visual impact facilitates and helps to better understand and contextualize the information.
The use of manipulative tools or resources (Lego or Playmobil, plasticine, etc...), can help to generate a clearer narrative of the concepts, serve as a motivating element for the participants and a catalyst for creativity

WHAT'S NEXT?

Generate even more different ideas. The greater the number of ideas that they solve.



4. VALIDATE AND CONTRAST THE IDEA

Objective

Contrast and validate the hypothesis generated about the problem and the possible solution.

On many occasions we are afraid to share our ideas for entrepreneurship projects, sometimes out of shame and sometimes in case they "take it away" from us. In our methodological proposal we bet because counting and contrasting is a very valuable personal learning tool, with which we also enrich the solution and the idea. Everyone wins.

Duration time:

60' to 90'

Resources needed:

Post it. Pens or markers. Continuous paper or blackboard. Zeal. Mobile devices with internet access.

Competences:

- Opportunity search
- Ethical and sustainable thinking

Group work sequence:

Presents the activity, the objective and the framework.

In this phase, we propose to build a story that helps us present the framework of our idea.

That makes it easy to tell what we want to do, what we want to achieve, who we want to help. In addition, with a creative tool, which already incorporates some "sales" elements, and allows us to put our communication skills into practice.

We are going to build a storytelling that presents the project up to the moment we are in. And we are going to organize the information in steps with the intention of facilitating the construction of the framework of the story. If the groups are mature and want to explore other ways of telling it... .., they will be welcome.



- Presentation of the affected person. (Include a representative name, age, tastes, studies, job...).
- Description of your daily life.
- Presentation of the problem in your daily life.
- What does the problem mean for the person?.

For now, we will leave our story at this stage, since we have not yet developed an idea, and we cannot present the solution, as advertising fictions usually do. It is about presenting the problem or need and helping to understand it.

We maintain the idea of working in groups, and building the information collectively. Organize working groups of between 4 and 5 participants.

We propose to make a written micro-story first, which helps to literalize and condense the information. In marketing and sales strategies, time is key and optimizing the information properly can help a lot to understand our proposal.
It guides the indications of the length of the story so that all the groups work with a common criterion. For example, no more than half a page.

Once written, invite them to read them aloud and share them with the rest of the group. Is the problem understood? Is the affected person clear? How does it affect you?

Invite groups to share this information in their WhatsApp groups or social networks to get feedback.

What if you propose that they hang them on networks and see who receives the most comments or likes? It is a way to use social networks as allies for this project.

If more time is available, applications such as can be used https://www.powtoon.com/?locale=es that allow the story to be converted into a video presentation format with animations. It is simple, free and very intuitive, and it makes it much easier to get the information to other people.

An interesting variable is to add a small survey to the story or video that allows collecting some metrics on questions that need to be validated:

Is the definition of the problem clear? Do you think it affects all people equally? Are you worried about this issue? Etc.
Collect all this information and apply it to the story to refine the concept as much as possible: problem or need + effects on people and people. Always using this information circle, we incorporate everything collected in the feedback and we improve our story again.

Recommendations It

may be interesting to offer a resource in which you can see what a storytelling translates into. Invite them to search the internet for how companies create stories to tell us about their proposals or products.

The stories, either on video or written, can be shown to the whole group and they can vote on it to give it a more dynamic touch. For example: Award for the best edition, the best voice, etc. They can vote without more, or propose the categories of vote.

Having game elements that accompany the work process help to more effectively link the participants to the process.

And what's next?

With the contrast of information and the feedback collected, we generate the hypothesis of change, that is, draw the deficit situation that we want to change and imagine how we would like that change to be. Build a hypothesis.

5. GENERATE THE HYPOTHESIS OF CHANGE

Objective

Think and define the desired situation, that is to say that you have solved the need or problem detected, and help build the hypothesis of change.

In short, what do we want to happen. How we are going to contribute to solving the situation.

Duration time:

45' to 60'

Resources needed:

Post it. Pens or markers. Continuous paper or blackboard. Zeal. Mobile devices with internet access. Canvas hypothesis of changes or similar.

Competences:

- Search for opportunities
- Ethical and sustainable thinking

Group work sequence:

Present the activity, the objective and the framework. Take a few minutes to go back to the last tasks or contents. Where we come from.

USE CREATIVE RESOURCES

Use creative resources to imagine and capture in a tangible way what the desired situation would be, that is, once we have already done something, what life is like for the affected people without that problem.

It is not easy to formulate a hypothesis so we are going to guide a sequence to make the process easier for the participants.

If you have time, it is very useful to capture this moment graphically. They can make a descriptive mural, a drawing, a small comic with two or three vignettes that represent that desired situation.

On the canvas we are going to keep the description of the situation. It is important that they describe it in as much detail as possible, as this helps us better visualize the end of the road. It is more difficult, but it is better to avoid generalizations in this part of the work.

To make the hypothesis, once this first step is done, we are going to use the attached canvas.

Briefly describe the exit situation. How is the problem or need today in relation to the affected people. Determine the main causes of the situation.

Once the photo of the departure point is taken, we return to the desired situation. How is this situation, and what has changed in the lives of the affected people.

The final challenge. Complete with post-it what has to happen in the middle, what steps we have to take, what does our idea contribute, what situations have to be given to go from one scenario to another. Although complex, it is advisable to invite participants to work in as much detail as possible.

Post-it colors can be used to determine what depends on our actions, and what does not, or incorporate other variables that help to understand the information better.

Recommendations

Work on the canvas in a group, share it and rotate it among the rest of the teams once it is finished. We invite the rest of the groups to participate in our hypothesis and in return we receive feedback and ideas.

And what's next?

With the hypothesis defined and the scenario of what we would like to see clear, the following is to delve into the idea and prototype to see if it responds or not to meet the needs.

6. PROTOTYPE THE IDEA

Objective

Make a first complete sketch of the idea and its development and execution. It is a first approach in prototype mode to the project proposal.

Test the concept and idea.

Duration time:

45' to 60'

Resources needed:

Post it. Pens or markers. Continuous paper or blackboard. Zeal. Mobile devices with internet access. Canvas of the 10 questions or similar.

Competences:

- Search for opportunities
- Ethical and sustainable thinking

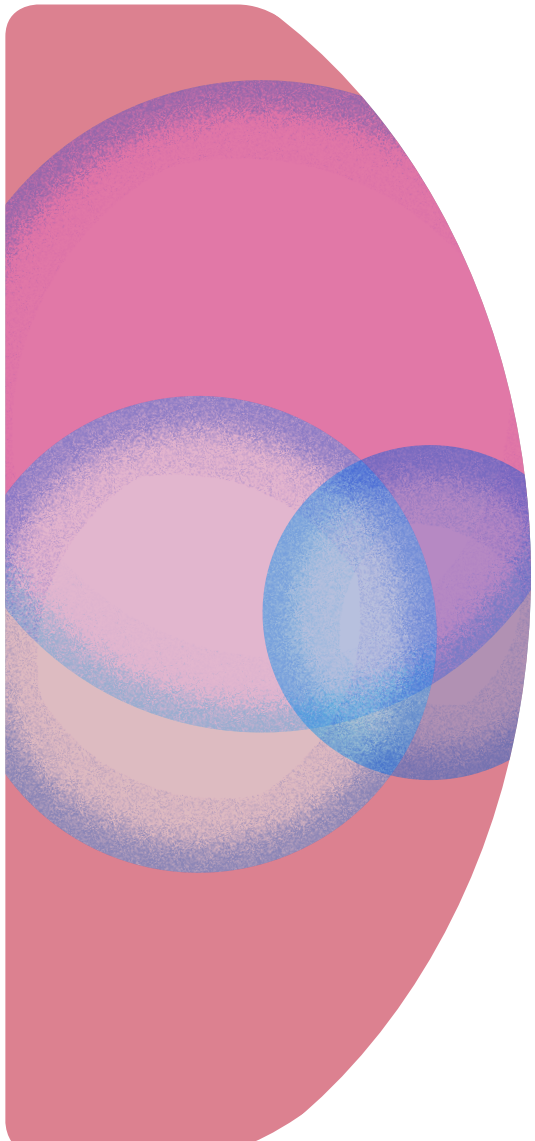
Group work sequence:

Present the activity, the objective and the framework. Take a few minutes to go back to the last tasks or contents. Where we come from.

An easy way to start to shape the idea, and put on the table the different edges or areas of development that an entrepreneurship project implies is a technique used for project planning.

It involves answering a series of questions, many of which have already been worked on in previous phases, which make us order the steps and solve those things that we still do not have clear or identified. And, if they are not clear, identify what you need to clarify or define better.

Later, we can prototype the project using the BMC or Business Model Canva template, but now we are going to prototype only the idea, not the entire project. In the case of groups whose work flow is fast, both canvases can be considered in a complementary way.



Use a continuous paper, a template, or invite each group to design their way of doing it. The important thing is that you answer these 10 questions about the idea.

- What do we want to do? Define the nature of the project.
- Why do we want to do it. Justify and justify the need.
- What do we want to do it for? What do we want to achieve. The purpose of the idea.
- How much we want to achieve. About the problem and the people... how many people do we want to reach, how much do we want to solve things.
- How we want to do it. Organizational, development, organizational aspects, etc.
- When are we going to do. All those temporary aspects that we need to take into account. Dates, hours, seasons, ...
- What are we going to do it with? Necessary resources.
- With who. Technical profiles, people, expertise, etc.

Where we are going to do things. From physical, virtual spaces, etc. All the sites we need to develop the project.
How much. First approach to economic issues. Identify everything that costs money (rentals, equipment purchases, campaigns, etc.)

Recommendations

Work the canvas in a group, share it and rotate it among the rest of the teams once it is finished. We invite the rest of the groups to participate in our hypothesis and in return we receive feedback and ideas.
They can be done in large format, share them on the classroom wall and leave them visible for other classmates to incorporate ideas for better.

If you have time, you can take this information, and use the interview tool (in real or through networks) to have a quality contrast with profiles affected by the problem or proposed solution. Prototyping the idea is only useful if we contrast the information, collect feedback and transfer it back to the staff until we improve and define the proposal.

And what's next?

With the hypothesis defined and the scenario of what we would like to see clear, the following is to delve into the idea and prototype it to see if it responds or not to meet the needs.

7. PROTOTYPING



7. PROTOTYPING

Objective

Make a first complete sketch of the idea and its development and execution. It is a first approach in prototype mode to the project proposal.

Test the concept and idea.

Duration time:

45' to 60'

Resources needed:

Post it. Pens or markers. Continuous paper or blackboard. Mobile devices with internet access. Computer with internet connection.

Competences:

- Search for opportunities
- Ethical and sustainable thinking

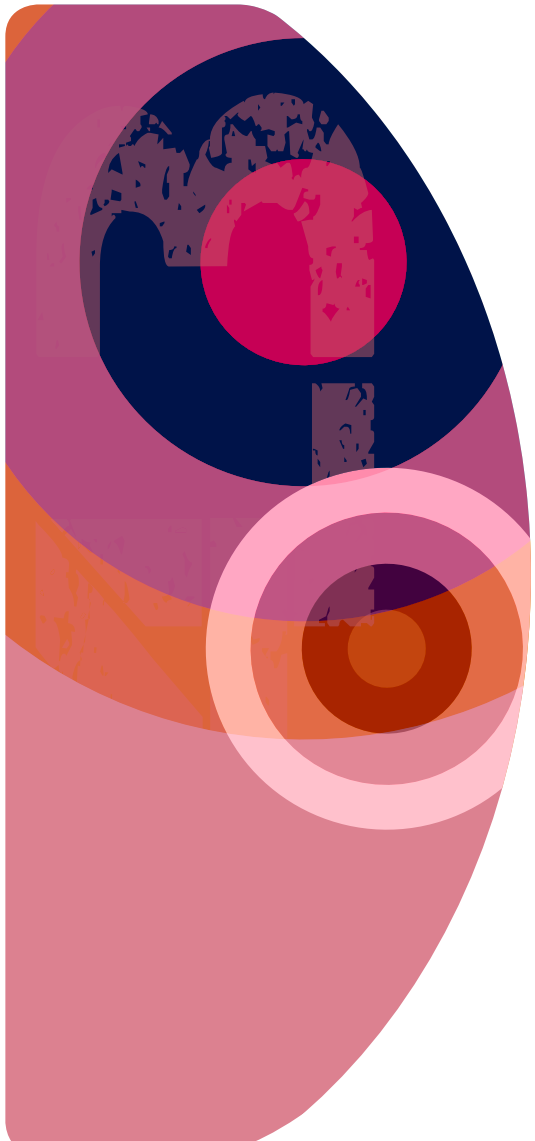
Group work sequence:

Presents the activity, the objective and the framework. Take a few minutes to go back to the last tasks or contents. Where we come from.

The idea, in general, is to create a website for the project, the brand, the service, ... a website that allows us to present and make the project visible.

It is time to collect all the information generated previously and which tasks can be organized within the team: content, image, photos, etc.

To make this website possible, we can use various free alternatives. There are many easy to use on the market. Invite them to find which one best suits their needs. Sometimes it is easier to start a Facebook page, from which you can later migrate to other formats.



This website can be accompanied by the social media channels of the project, which can serve and help to have a first community of collaborating people who generate continuous feedback, test ideas or simply contribute ideas and help promote the idea.

To make the web, and complete the basic sections, we will need to work and define several aspects:

- Name of the project
- Brand, image or logo
- Define the product or service that is offered
- Identify the Value Proposition

Invite to visit websites with similar proposals or that work in similar areas or projects to see how they are structured, what content they have, etc.

The need to define this information within the web helps the group to decide and specify those aspects that have not been closed in the previous sequence, when we prototype the idea. With the prototyping of the project, we take a step forward and make all the information worked visible.

Creating the web and social media channels can have a dynamic component in the classroom, inviting small competitions in relation to content that increase motivation and favor the work environment:

who has more responses, more likes, more interactions, etc.

Recommendations

Invite us to share the web on social networks, as well as the rest of the information worked on:
Presentation of the promoter team, its bios, the project report, reflections on the process, ect.
This parallel work process also involves personal learning, and helps to value your commitment to the idea.

And what's next?

Once the product or service prototyping part is done, we need to move forward in showing our proposal to collect opinions again.

This continuous cycle of doing + showing + collecting information + applying improvements, continually enriches the idea, and helps us reach the end of the process with a better proposal.



8. TEST

Objective

Show the idea to the target audience. Test the concept and idea.

Duration time:

45' to 60'

Resources needed:

Post it. Pens or markers. Continuous paper or blackboard. Mobile devices with internet access. Computer with internet connection.

Competences:

- Search for opportunities
- Ethical and sustainable thinking

Group work sequence:

Present the activity, the objective and the framework. Take a few minutes to go back to the last tasks or contents. Where we come from.

For this part of the activity, it is convenient against a group of people outside the process. The ideal situation would be a group of potential users of the service or product.

If you are working on the idea of doing a project within the same framework of the Educational Center, it is easy to have other students to whom you can raise the idea. If not, other teachers, people with entrepreneurial experience ... more people and more profiles are better to provide a variety of views.

The idea is to have an open space for reflection in which to collect information and to be able to incorporate new nuances to the proposal. It is part of the logic of continuity of learning and incorporating learning.

On the internet you can find numerous scripts of interviews with experts or similar, but we invite that the questions and script to be generated by each group in relation to the contrast of needs they have. Perhaps one group only needs to know whether or not they would pay, but the other group needs to take a larger questionnaire or collect more information.



Recommendations

Work in advance the scripts for the interviews or the space for work and reflection.

Preview the profile of people with whom we are going to count. Contact in advance so the group knows who will be in front of them during the validation process with a user or potential client.

If you have time, it works very well to rehearse a role-playing that enacts either the problem and the solution, or the product, etc. Not so much for the part of collecting information as for helping to understand what our proposal consists of.

With the importance of the validation phase, other processes can be incorporated such as visits to projects or similar companies with the objective of contrast and learning. Likewise, invite the centers to these entities to serve as validators of the process.

And what's next?

At this point, once the improvements of this activity have been incorporated, a pilot of the project or a beta version can be planted, which no longer yields real experience results.

9. VALIDATE THE PMV

Objective

Place the project at the starting point to be able to make a prototype version in Minimum Viable Product mode.

Give value to the entire work process and help make the commitment of the students visible.

Duration time:

90' to 120'

Resources needed:

Post it. Pens or markers. Continuous paper or blackboard. Mobile devices with internet access. Computer with internet connection.

Competences:

- Search for opportunities
- Ethical and sustainable thinking





Group work sequence:

Present the activity, the objective and the framework. Take a few minutes to go back to the last tasks or contents. Where we come from.

We propose to set up a Project Fair, in which each of the working groups can set up a stand in which the participation in a project fair or event is similar.

Each project stand should have the image of the project, promotional elements, beta versions of the project or the service to be provided, and take visitors as potential clients.

It can be visited by friends, family, other groups in the center, open event. We understand that the more exposure, the more learning.

To better streamline the work, we propose, as an axis in the visit, that each visitor use a template to collect information about the projects and rate them. It can even be in a Google form, which explodes the graphs of opinions and votes on a public screen.

Likewise, it can be accompanied by giving each visitor an amount of euros, so that they can decide which project is worth their investment. Giving all visitors the same amount.

Recommendations

Spend time preparing the presentations and the stands of each group in order to provide the exhibits with a certain quality.

And what's next?

Make it real!.



HE ENTRECOMP DIGCOMP

Cofunded by the Erasmus+ Programme of the European Union

HE ENTRECOMP DIGO



IMPLEMENTATION IN HIGHER EDUCATION CENTRES

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INDEX

• Introduction and Context ..... Page 69
• Project implemented in Greece ..... Page 70
• Project implemented in Italy ..... Page 72
• Project implemented in Spain ..... Page 75
•Project implemented in Turkey ..... Page 78

TEACHER'S PROJECTS

Introduction

Below we include a series of projects carried out by teachers from the different partner schools of this project in which the methodologies and tools explained in this guide are applied as a means to develop students' entrepreneurial skills and competences. These projects serve as an example of the application of the methodologies mentioned above and can be replicated by any other educational agent who wants to achieve the same objectives or can also be used as a guide to develop other similar projects applied to other educational situations or environments.

Context

Teachers should use this template to describe the characteristics and basic elements of the projects they have carried out in their Higher Educational Centers. These projects aim to improve and promote the entrepreneurial and digital competences of the students. **After the training activity held in Greece (C1), the teachers had to design and implement a project, using the knowledge and tools received in the training activity, and collected in the "Guide for the Development of ENTRECOMP and DIGCOMP Framework in Higher Education".**

1. Name of the project

DIGI-Health

2. Project implementation dates

7-8/4/2022

3. Description of the project

The Project was to create a vest with medical and communication devices in order for the population of special geographical regions or areas (especially mountainous areas of Greece) with difficulties in accessing medical facilities and specialized doctors to be monitored preemptively by medical staff.

The vest can have a variety of devices and sensors to capture and transmit to a central database the medical data of the individuals monitored. There are three specific project objectives that must be met:

1. The cost of the vest must be lower than 400 Euros.
2. The vest must be light (battery life more than 7 days and aesthetically pleasing) and to be integrated with existing communications channels (WiFi, GPRS, etc.) without the intervention of the individual monitored.
3. The data must be integrated with the medical history of the individual and if specific (determined by a doctor) parameters are met, the doctor can initiate the process for a visit to the near by hospital.
4. Security of the data is of the upmost importance.

There were three professors (business/financial, marketing, technology) with different areas of expertise that were used as consultants for the five groups of students. Each group was given a business canvas to use to approach the project and to determine the problems that the manufacturer / service provider had to solve. Three groups were assigned to approach the project as the manufacturer and the other two as the service provider.



PROJECT IMPLEMENTED IN GREECE

4. Objectives

a. Acquire knowledge
b. Develop problem solving skills
c. Groups working skills
d. Critical thinking

5. Methodology

- We used the Project – based learning methodology
- Business canvas
- Brainstorming
- Presentations

6. Results

- Understanding the complexity of the business problems
- Approaching knowledge as a tool to solve problems
- Better understanding of interconnectivity and the specific issues (technical, marketing, financial, etc.).

7. Resources

- Human resources: Three professors, 25 students
- Material resources: Business canvas, manuals, whiteboards – markers



PROJECT IMPLEMENTED IN ITALY

1. Name of the project

EDUCATION TO ENTREPRENERUSHIP/POLARIS TEAM

2. Project implementation dates

a. September 2021: teachers training in Athens

b. October 2021 – May 2022: sensibilization in the associated partners high schools about the Project "HE-ENTREDIGComp – Development of EntreComp and DigComp framework in Higher Education" and the education to entrepreneuship; meetings with the students and referent teachers for the selection of the participants.

c. June 2022: training course on the entrepreneuship and Hackathon in Vasto

3. Description of the project

THE PROMOTION OF THE PROJECT AND PARTICIPANTS SELECTION
Polaris' staff has created a presentation of the Project in italian with the description of :

- Target
- aims
- planned activities
- expected results

The training course

The selected participants were 12 students from high education institutions, Polaris staff has involved them in an intensive training course (8 hrs of duration) in classroom; the program was:

a. What is the education to entrepreneuship
b. The three areas and the 15 competences: ideas, actions and resources
c. Some capacity and competences within the framework of three areas
   i. Anályzing capacity
   ii. Problem solving capacity
   iii. Team-working capacity
   iv. Communication capacity
d. What is a Hackathon: objectives, rules, methods and resouces
e. The topics of Agenda 2030 and n. 26 SDG-Sustainable Development Goals of the Agenda

The hackathon

After the training course the participants have been divided in 4 teams, each of them has selected one of the SDG and an issue linked to the SDG; anlyzing the problem and the possible solutions addressed to the selected SDG (analysing capacity and problema solving capacity), each team (team-working capacity) has developed an idea and/or a social business item to fase up the problem and has created a digital presentation of the idea (communication capacity), for a total of 4 halves days (2 days).

4. Objectives

Development of :

- Entrepreneurship skills, such as self-awareness, problem solving, team working, communication
- Digital skills: the students have used laptops, .ppt presentations; they have used also the social media for dissemination activities.

PROJECT IMPLEMENTED IN ITALY

5. Methodology

The teachers have used the role play (e.g. for the problem solving and communication lessons) and active learning methodologies (learning by doing, project work).

6. Results

a. Presentation of the Project to the schools and higher education institutions
b. An intensive training path of 8 hrs
c. 4 projects for the students

7. Resources

Polaris has used:

- human resources: staff for the promotion, tutors in the classrooms and trainers entrepreneurship; all the people has been paid with the Project funding.
- material resources: Polaris has provided 4 laptop, 2 classrooms and 1 whiteboard.



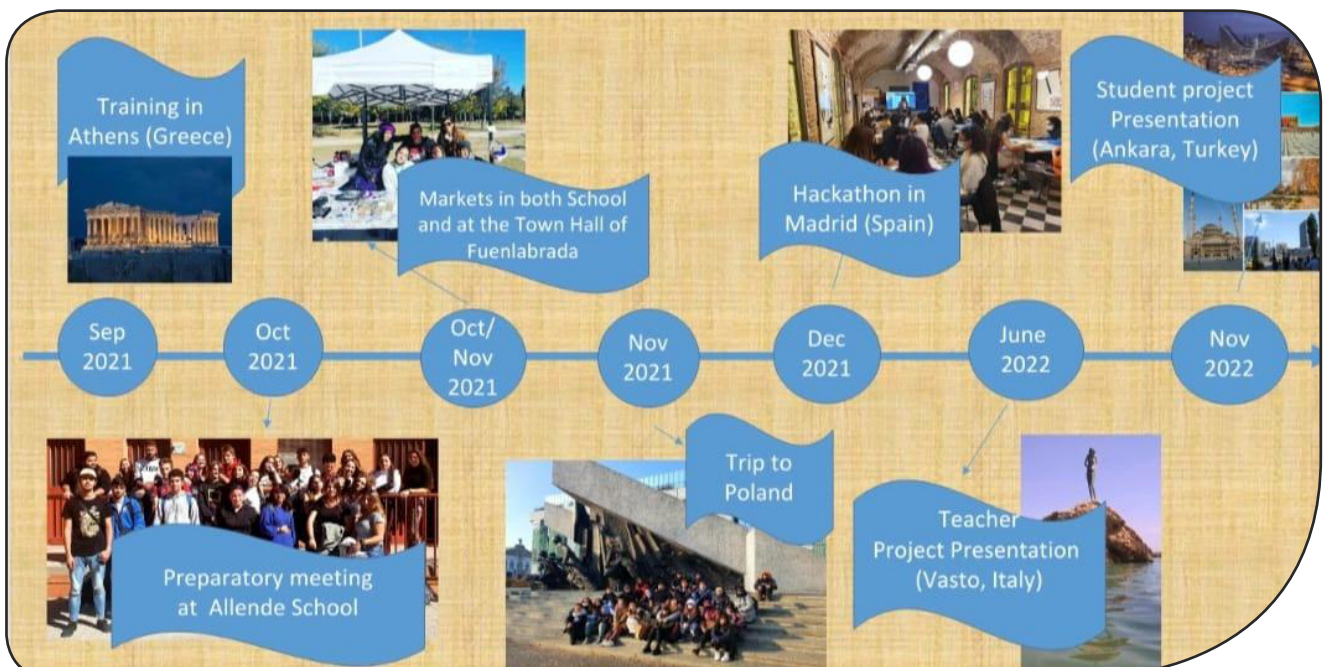


PROJECT IMPLEMENTED IN SPAIN

1. Name of the project

SANTA ENGRACIA/ALLENDE TEAM

2. Project implementation dates



PROJECT IMPLEMENTED IN SPAIN

3. Description of the project

A. PHYSICAL / VIRTUAL MARKET. OCTOBER 2021.

- The selected applicants will develop an entrepreneurial activity to get money and finance their trip:
  - With resale of products.
  - Elaboration of artisan products.
  - Offer of services (image consultancy, makeover, photographs).
- All applicants selected from all centers (IES Santa Engracia and IES Salvador Allende) will be in a TEAMS and they will present their ideas and propose collaborations in the mencioned centres.
- It will be held in the centers (it can also be virtual) where the different products will be offered.
- The entrepreneurial activity will be assisted by EIE teachers throughout the process.

B. VISIT OF COEXISTENCE AND ENTREPRENEURIAL TRAINING IN RADOM, POLAND. From 10th to 15th NOVEMBER 2021.

- Selected students from both institutes will have the opportunity to spend three days visiting an European city.
- They will receive training by the teachers involved, on entrepreneurship: creativity, innovation, development of ideas, implementation of projects, etc.
- Cultural visits will be held in the city.
- Teams will be formed among students from both centers for their participation in the Hackathon.

4. Objetives

- Development of skills:
  - Entrepreneurship:
  - Creativity
  - Innovation
  - Ability to take risks
  - Ability to work in a team
  - Ability to solve problems and solve conflicts
  - Ability to adapt
- Digital:
  - Management of digital environments
  - Cooperation in digital environments



5. Methodology

- What methods or tools have been used during the implementation of the project?
  Active methodologies, with the participation of the students, flipped classroom, team works, project-based methodology...
- Activities?

  Training and street markets in both schools, street market in cultural center, travel to Poland to a training on entrepreneurship and cultural visits.

6. Results

Which results has the project achieved? Please, relate this answer with the objectives.



TARGETS	RESULTS	OBSERVATIONS
Development of skill of Entrepreneurship . (Creativity, Innovation, Abilities of take risks, work in a team, solve problems and conflicts, adaptation).	Achieved	All students developmented these skills with the challenge and their projects.
Development of skill of Digital. (management and cooperation in digital enviroments).	Achieved	All teams worked in TEAMS, and post their works in social media.

7. Resources

- Human resources: entrepreneurship coordinator and teacher from IES Santa Engracia and Entrepreneurship and Erasmus coordinator from IES Salvador Allende. 25 students selected from IES Santa Engracia y IES Salvador Allende.
- Material resources: 100 € from department of FOL from each school.

PROJECT IMPLEMENTED IN TURKEY

1. Name of the project

DRIVESENSE

2.Project implementation dates

2. June 2021-June2022

3. Description of the project

It has been observed that the negative moods of the drivers (angry, sadness, etc.) increase the accident risk approximately 10 times. RQ: Is it possible to prevent traffic accidents? How can it be handled and solved? DRIVESENSE intends to solve the problems derived from Distraction-affected Crashes by Smart Driver Tracking System.

4. Objetives

- Driver behavior can be improved.
- Accident rates can be reduced by 1/3.
- Preventing loss of life
- Reducing economic losses
- Increasing the quality of public transport
- Increasing public transport driving safety
- Ability to create of driver risk analysis



5. Methodology

- What methods or tools have been used during the implementation of the project? Design thinking, SWOT Analysis, Competitor Analysis and Business.

Canvas Model has been used while implementing the project.
- Activities?

- Prototype (Software and Hardware) Development
- Field Tests and Improvement
- Limited Production (LRIP)
- Mass production

6. Results

- Which results has the project achieved? Please, relate this answer with the objectives.

Drive Sense Corporation was established as a Start-up in OSTIM Teknopark.This is the first University Company that was owned by the lecturers.

7. Resources

- Human resources: 3 founder and 3 engineers
- Material resources:

For Sustainability and Dissemination, these material resources are provided:

- Social Media Management (instagram, linkedin, twitter etc.)
- Webpage Design
- Manual, Handbook, Brochures etc.

This information must be sufficient so that any other educational center can replicate it and must have a maximum length of 2 pages. The font will be Arial and the size 12p.

Swot analysis

INTERNAL FACTORS	**STRENGTHS** • We have enough infrastructure and facilities. • We have lots of capable students. • We have lots of SMEs, i.e. lecturers. • We have experience in AI-based software.	**WEAKNESSES** • We are not the first mover in the market. • Our raw materials, microprocessors, chips etc., are expensive compared to our opponents.
EXTERNAL FACTORS	**OPPORTUNITIES** • There are some VAT and Income Tax advantages for Startups. • There is some financial support from Public Funds.	**THREATS** • There are some strict regulations for lecturers to start a business. • There are powerful competitors in the market.



Business canvas model

KEY PARTNERS	KEY ACTIVITIES	VALUE PREPOSITIONS	CUSTOMER RELATIONSHIPS	CUSTOMER SEGMENTS
• Management of OSTIMTECH • Governmental Agencies (such as tax authorities) • Suppliers • Lecturers • Students • Fund Suppliers • Mangement of Teknopark	• Software development • Hardware development • Field tests	• Improvement in driving Behaviour • Decreased accident rates • Reducing economic losses • Increasing the quality of public transportation and safety	• Clear and transparent relationship • International standards • R&D based sustainability	• Public customers • Bus producers customers • Logistic firms • Vehicle Tracking System Companies • Cargo companies
	KEY RESOURCES • Experiences and applications in AI-based software • Experienced software engineers		**CHANNELS** • Business development department • Social media • Webpage of firm	
COST STRUCTURE • Microprocessors • Integrated cameras • Microchips		**REVENUE STREAMS** • Profit from per production • Yearly business charge		

