



Core skills for the 21st century

Trans-European framework for Core personal skills

Core Skills for 21st Century Professionals

2017-1-ES01-KA203-038589

Intellectual Output 1

Lead partner: Universitat Politècnica de València (UPV)



Co-funded by the
Erasmus+ Programme
of the European Union



This project has been funded with support from the European Commission.
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1 Introduction

1.1 The need of the project CoSki21

The backbone of CoSki21 project is to bridge the skills gap which is reported (e.g. Mourshed 2014; WEF 2015, Jones 2017) between educational institutions and working life. A skill gap means that graduates/employees have lacks in their skills in respect to the skills needed in a working position or working environment. In especial, gaps seem to exist in so called soft skills.

These skills gaps are pernicious for all the stakeholders, which means graduates, companies and higher education. For graduates, lack of some essential skills will probably decrease employability chances as well as prevent career success. As recruited professionals in companies are considered as investments, an optimized staff performance is desired. For business universities, skilled and competitive graduated is a goal for several reasons, one of the most important being that they are measured by the employment rate of graduated. High employment rates of graduates provide a competitive advantage to business universities in relation to other universities.

What can be done to solve the problem of skills gaps? We believe that higher education has both a mission and a capacity to provide their students with adequate skills to match with the requirements of 21. century organizations. To do so, they need a more accurate understanding on the soft skills needed in the different professional fields.

From the point of view of companies, they have assumed different applications of CMS (competence management system) in order to administer their human resource development activities. These particular systems usually include skills maps to be used in the client organizations. However, there is not necessarily any connection between the skill maps and the skills existing in higher education curricula.

This is one fundamental origin for the skills maps and it forms an obstacle for the discussion between educational institutions and working life. A 'first step' to solve this situation is to create common framework of skills regarding professional fields involved.

1.2 Intellectual Outputs

In order to provide solutions to the skills gaps problem, the Core Skills for 21. Century project has set following goals (see also figure 1):

1. To create a common framework for soft skills, which includes both the 'needed by organizations' and the 'educational' aspect. The creation of the framework is enabled by a) an extensive study on existing skills systems and b) a questionnaire designed for detecting the needs of companies
2. as soft skills are 'newcomers' in curricula, provide guidelines for evaluating and assessing them



3. to create and disseminate piloting methods for fostering and self-empowering soft skills

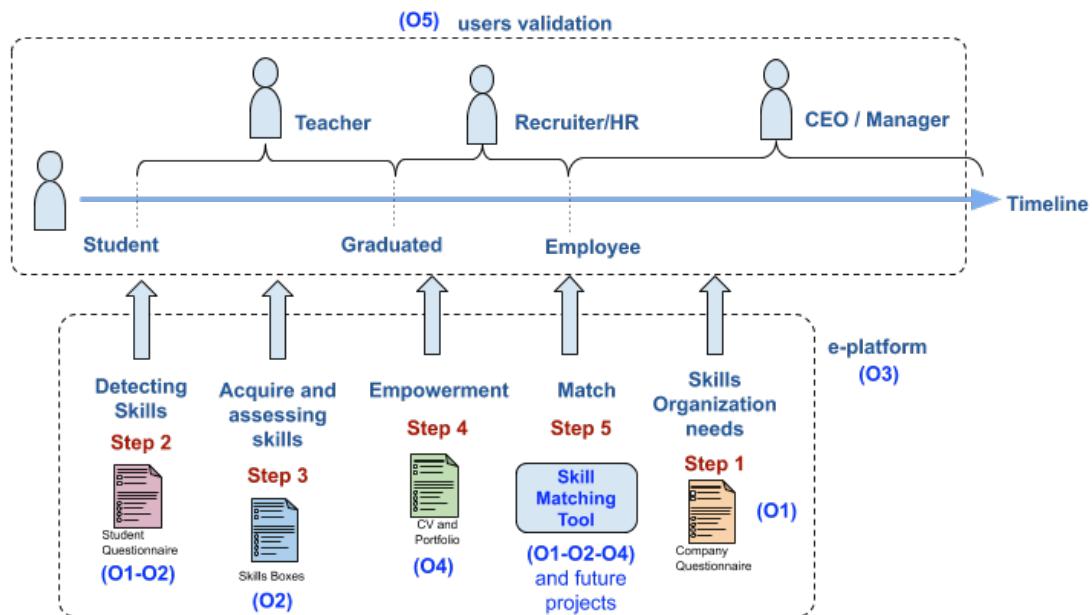


Figure 1. The intellectual outputs of CoSki21 enable bridging the soft skills gap, addressing all stakeholders

The intellectual outputs are by all designated to all stakeholders in the process. For teachers and curricula planners they will provide an updated state-of-art on competences and skills needed, while students and graduates take advantage in form of higher match for working life. For managers and recruiters, who do not yet apply a competence management system, these outputs offer a detailed insight on skills-sets and methods for fostering them. All practical deliverables are presented on the e-Platform of the project.

1.3 The Output 1

The output 1 'Framework' has two main scopes (illustrated in figure 2), the first one is to structure and harmonize the titles and characteristics used when discussing personal competences and soft skills. This is conducted by reviewing existing skills maps and competence management systems. The aim of this review is to find out the most commonly used titles of soft skills. This is important as a big variety of titles and attributions are used in the discussions, a part of them having a marginal significance for all companies, whereas some of them are important for most companies.

The second scope is to detect the special need of soft skills in business and entrepreneurship. This knowledge is especially important for business educators and the VAT trainers working in or with organizations. The procedure is conducted through creating and launching an online-survey which is able to include the essential dimensions of skills needs. This means the angles of



the different stakeholders (managers, recruiters, teachers, graduates). In order to get a genuine insight on skills needed in business and companies, the survey will be launched to business professionals and entrepreneurs.

The questionnaire and the survey will enable following indications regarding the status of soft skills in an organization:

- detecting most significant skills in a work position
- evaluating the development potential of each skill
- assessing level of graduates/employees in respective skills

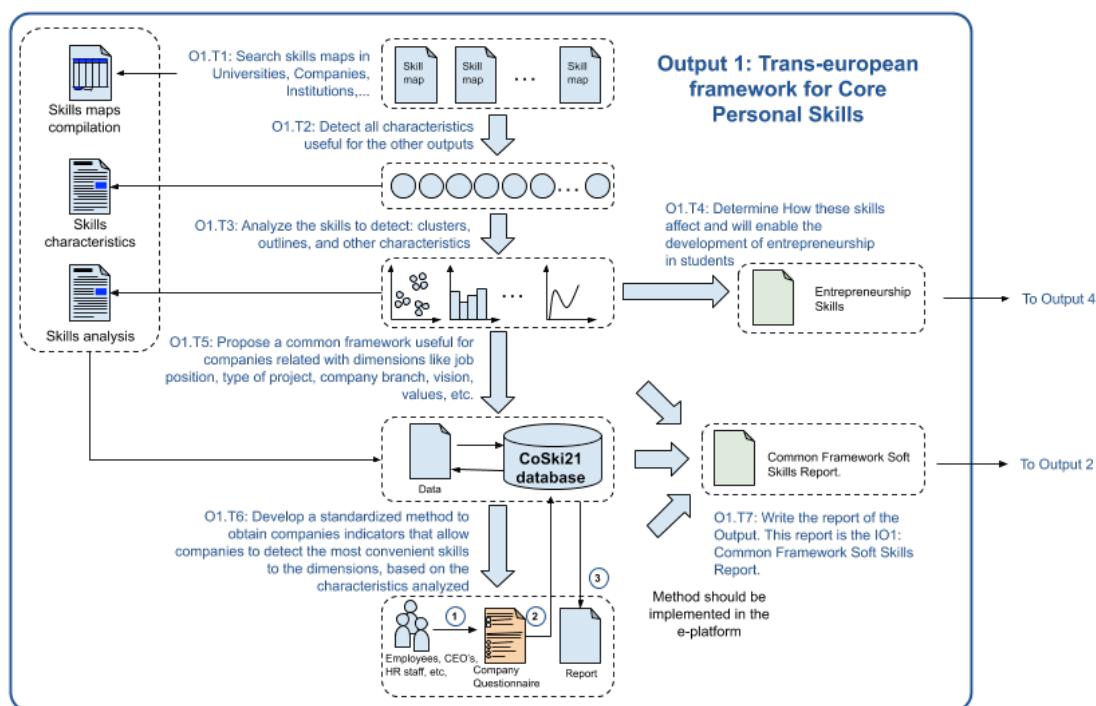


Figure 2. Intellectual Output 1 seeks to structure and harmonize different skills compilations into a common framework, in order to develop a standardized method matching skills needs and offers.



2 About Soft Skills and Core Skills

2.1 Better call them core skills

The development and use of new technologies depend on intelligence and, specially, how this intelligence is applied. The skills involved in this process can be understood as *hard skills*. Technological advances were initially due to geniuses, but nowadays they are mainly due to teams. Success of teams does not only depend on the hard skills level of their participants, it also depends on the management of the personal interactions of each member with the group and with the working environment. People started to refer to these skills as *soft skills*, in opposition to hard skills. An exhaustive and definitive list of the soft skills does not exist since it is yet unclear the definition of many of them. It is also worth to point out that soft skills are not limited to social skills, leadership, or work in teams. We also consider as soft skills, individual skills like self-control or resiliency or organizational skills like time management.

In the last years, there is an abundance of well-trained people that possess the *hard skills* required to take most of the jobs. A fragmentation of a task can lead us to split into tiny parts that can be developed by well trained technicians in particular parts. Such a division omits a holistic vision of a work or a project. This permits to reduce costs, since the parts in which a project is divided has a limited complexity and one can find many people able to conduct them.

So as to, the reduction of costs implies that hard skills are less crucial, and that is easier to find people that can replace workers whose main tasks are related with hard skills. Even more, these parts of the works can be easily outsourced, while retaining the intellectual property of the project as a whole.

It is somehow contradictory that in a knowledge economy, hard skills could become a commodity, but what happens is that the complexity of the projects in the knowledge economy is increasing more and more, and it is required the combination of the outcome of different specialists to deliver a product. In this interaction between specialists of different areas, soft skills are becoming a must and also worth to be considered as relevant if not more than hard skills. The need of this human touch in a job also represents a clear indicator of how difficult is to outsource a job.

Soft skills are becoming more and more important every day, because they are directly tied to teams' success. Alternatively, they are also called as *transversal skills*, since they are not specifically tied to a particular job and can be used in different contexts. Nevertheless, success in a job position is not limited to the hard skills level of the employees. Soft skills are becoming more and more critical, we consider that they should be better called *core skills*.

Talent can be seen as the union of intelligence and the ability to execute specific activities. So that when an organization hires a worker, it is assured that he has the intelligence to develop a



job. However, the success in the job position is not only tied to the technical qualification (hard skills oriented). However, despite they have the intelligence to develop a job based in soft and hard skills. This has been reflected into a new paradigm within work organizations, where human resources management has evolved to talent management. Consequently, soft skills are one of the bricks needed in the talented organisations in a world 4.0.

2.2 Training in hard skills and soft skills

There has been a revolution in the design of curricula in higher education around the world in the last 20 years in several ways. Three of the most remarkable ones are:

- a) The emergence of new job positions with new attributions has fostered an increase in the number of degrees offered by the universities. Even more, for a different type of degree there can coexist different approaches.
- b) The degrees are structured in order to acquire certain competences and learning outcomes, and they are not merely based on what knowledge has to be learnt by the student.

Both items require the recognition of (1) the equivalence of degrees from different institutions, (2) the qualification for taking certain job positions, (3) the acquisition of competences by the students, and (4) inner quality system to check that the previous items are correctly acquired by the students. All these points are certified by the evaluations of quality and accreditation agencies.

In spite of an increased awareness about the relevance of soft skills, they are poorly explicitly represented in the curricula of university studies. It is true that the current accreditation of university degrees is based in the acquisition of competences. Part of them have a non-technical nature and are strongly tied with some soft skills. However, teachers and trainers are not completely involved in the process of people acquisition. In the evaluations carried out by these agencies, competencies like work in teams, leadership, and communication skills are checked. However, other soft skills are not considered.

It is not even clear what are the soft skills required for each job position. Despite that there have been several initiatives to collect this information, like ESCO, it is still a challenge to select and integrate it in the design of the university degrees. Alternatively, looking at the portfolios of courses on continuous education, soft skills are starting appearing in the last years. Again, there is not a unified vision of what is understood as soft skills, and neither what are the most elementary and essential soft skills.

As for teachers and trainers, more efforts to help them to include the development of these skills are needed. The arrival of the need of inclusion of the competences in the curricula has not been always clearly shown and explained. We recall that university teachers have been mainly hired by their mastery on scientific skills and, moreover, to teach these very same hard skills. In many cases, they are not really convinced of including them in their courses. They justify



that how should I be interested in including them when my students do not even control the corresponding hard skills. This is somehow a we fallacy, we all had good teachers that influence in our lives, but digging inside, it was not only for their mastery in their topic, it was also by their personality and other skills that showed us when teaching their courses.

2.3 The most suitable soft skills: Skills for you

As not every content is necessary for carrying out a particular job, not every soft skill will be necessary to be considered for each job position. Moreover, in some cases it will be counterproductive. Let us take for instance the case of a person that has developed the leadership skill up to a relevant level, that is working as a shopper. Probably, to take this job when he is still as a student, it is yet a good idea, but not in the long run.

A first approach to know what are the most suitable skills for a job position is to ask to recruiters and HR staff. However, since it is not even clear what is the catalogue of soft skills, it is even more difficult to say what are the right soft skills for each job, and to determine up to which level candidates need to have them. One last thing, in many cases a soft skill can be developed at different registers. For instance, there are several styles of leadership and work in teams. One should also have a look not only to the skills, but also to know how to catalogue them according to job positions and the mission, vision, and values of the company.

2.4 Accreditation of soft skills

A more advanced topic related to soft skills is the accreditation and certification of their acquisition. It is clear that the theoretical basis can be thought and can be evaluated as the content of any other subject, for instance, through an exam. It is clear that nobody will choose an employee according to the grades on an exam of soft skills. However, will it be enough with a practice exam with controlled conditions? As we can see, there are many open challenges related to the acquisition of soft skills, that are not just tied to the detection and the training, their assimilation is still an open question to be dealt with.

Soft skills are a typical example of the learning by doing approach. In fact, evaluations of 360° type (or through a role playing) combined with the collection of references in the business environment are an option to take into account. This is inspired in the following: The more time a person is sharing with someone else, the better you know him. Lastly, but not least, once someone has achieved the previous items, it remains open the challenge of determining levels within each skill. Candidates as accreditation agencies can be talent recruiters and HR staff members of different units within a company or an institution



3 The soft skills maps analysis

3.1 The importance of skills maps

Organizations need to know what soft skills their employees require. Usually these organizations use competence maps or skills maps. These maps are a compendium of various competencies that seem appropriate

to a specific job. For example, for business positions, negotiation and communication skills are necessary, while, for an administrative position, order and clarity or time management are more important.

The fact that different skills are necessary for different jobs means that a company cannot have a specific personalized map. However, it is possible to find a subset of common competencies. Figure 1 shows the process that was formalized and studied in this project.

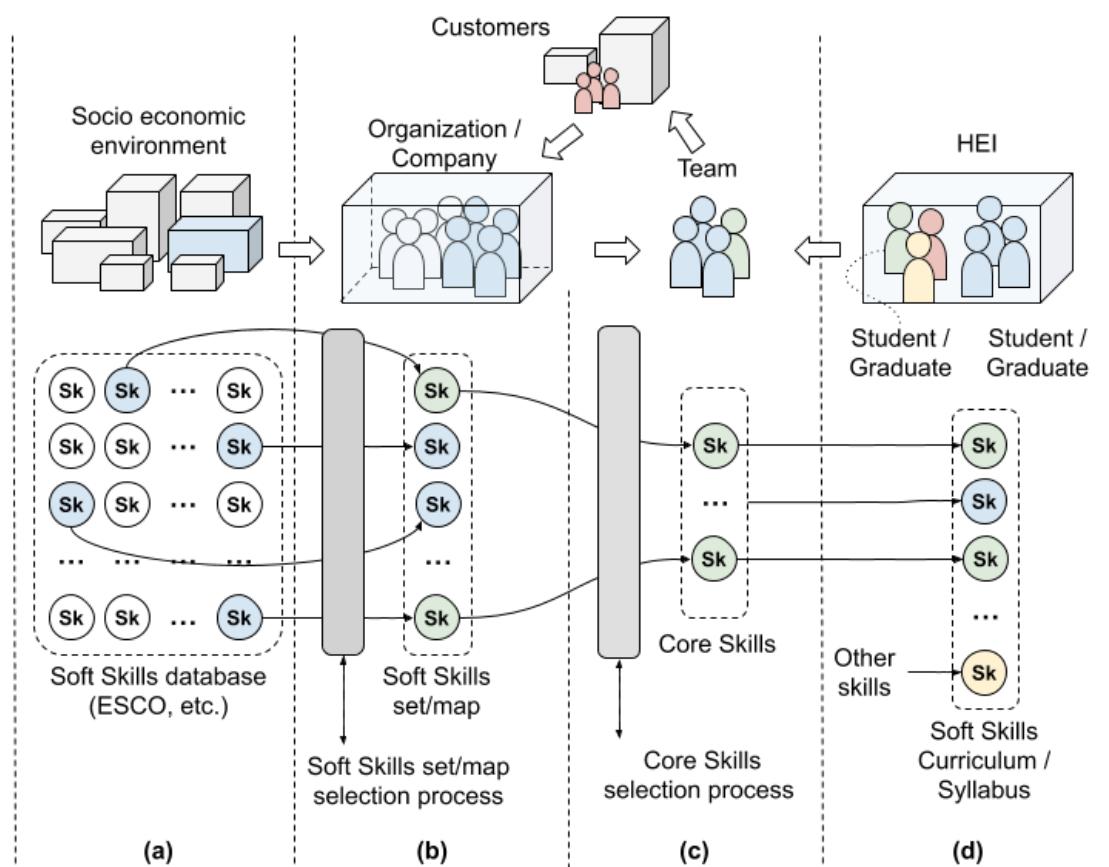


Figure 3. The process of select the Core Skills for a company



The figure shows the objective is to determine the set of core skills, which a team needs to carry out a project, a product, a service or to cover an objective of the organization. To reach this set, it is necessary to know the set of available soft skills (column 'a', in the figure). There are many localizable soft skills, so the first step is the process of selecting, from that large amount of soft skills, those that are relevant to the organization. This process can be done by clustering those related soft skills that have been defined differently; this part will allow defining a more concrete framework.

Step (a) is not enough; this step provides a framework on which specific core skills should be selected. This process does not consist only in choosing some skills from the organization's skills map (b). For this selection, the work of the work team and the people involved must be taken into account. In addition, it is important to know the client's requirements. Finally, the dimension that is the aim of this project: if the university can provide such soft skills to its students (d). Therefore, the objective of the framework is to have a subset of the company's skills map. This subset must be useful for:

- Organization.
- Client.
- University.
- Person.

Detection, evaluation, improvement, and accreditation of these core skills are the present challenges of human resources department. Even more, the definition of the core skills required to each job position is still object of study. Several initiatives have been conducted in the last years in Europe. Within EU, ESCO project¹ has tried to classify, identify, and categorized information regarding the three cornerstones for describing the labor market: (i) types of occupations (2942), (ii) skills and competences required to conduct any of these occupations (13485), and (iii) what are the qualifications that assured an optimal level of competence to conduct an occupation (9458). This information can be used by EU employers to improve their recruiting and employees training within the company, and by educational institutions improve their programs. There have been also alternatives to reduce and unify the

3.2 Skills maps

3.2.1 About the term map

Based on the thesaurus TESE², there is a list of terms that can be used to describe soft skills. In order to determine which terms can be used a comparison has been done. For the comparison, all the terms used in the literature have been considered, and Google has been used as a generic search engine, but especially scientific search engines (Scholar, Research Gate, Academia, Ref Seek) and professionals (LinkedIn and Eurostat).

¹ ESCO Project (accessed June 2018). <https://ec.europa.eu/esco/portal/home>

² TESE (accessed June 2028) http://eacea.ec.europa.eu/education/eurydice/tese_en.php



| Term | Google | Scholar | ResearchGate ³ | Academia ⁴ | LinkedIn ⁵ | RefSeek | Eurostat ⁶ |
|------------------------|----------------------|--------------------|---------------------------|-----------------------|-----------------------|---------|-----------------------|
| "competency map" | 20800 | 654 | 8/17 | 0 ⁷ | 333 | 4880 | 9 |
| "competency mapping" | 240000 | 1550 | 14/50+ | 2 | 69 | 44300 | 73 |
| "map of competences" | 19400 | 109 | 2/100+ | 0 | 35 | 297 | 8 |
| "map of competencies" | 31300 | 129 | 8/20 | 0 | 213 | 353 | 1 |
| "competence map" | 5630 | 543 ⁸ | 22/23 | 7 | 3 | 1680 | 30 ⁹ |
| "competencies map" | 2150 | 132 | 8/6 | 3 | 317 | 741 | 0 |
| "competences map" | 1260 | 68 ¹⁰ | 2/2 | 0 | 10 | 238 | 7 |
| "skill map" | 39500 | 401 | 25+/100+ | 12 | 185 | 6540 | 1 |
| "skills map" | 67500 | 1150 | 100+/1000+ | 22 | 746 | 13700 | 62 |
| "map of skills" | 310000 | 76 | 100+/1000+ | 11 | 568 | 1160 | 3 |
| "competency list" | 17800 | 1480 | 25+/25+ | 0 | 94 | 5110 | 2 |
| "list of competences" | 107000 ¹¹ | 1500 ¹² | 25+/100+ | 0 | 38 | 2410 | 2920 |
| "list of competencies" | 240000 | 7080 | 25+/100+ | 0 | 209 | 16100 | 2410 |
| "skills list" | 531000 | 2800 | 100+/1000+ | 0 | 1400 | 215000 | 99 |
| "list of skills" | 1900000 | 10400 | 100+/1000+ | 9 | 2666 | 122000 | 7200 |
| "competency framework" | 425000 | 15300 | 25+/1000+ | 100 | 11 | 115000 | 356 |
| "competence framework" | 94100 | 4900 | 100+/1000+ | 100 | 1007 | 20800 | 671 |
| "skills framework" | 190000 | 6800 | 100+/10000+ | 0 | 14 | 61300 | 124 |
| "transversal skills" | 452 000 | 38 100 | 18/100+ | 0 | 16 | 0 | 0 |

Table 1. List of terms to be used in the ambit of Soft Skills maps.

The most relevant result is that in the scientific field one must speak of "skills framework" for everything related to transversal competences. From a scientific point of view, the terms "skills map" or "skills lists" are appropriate. Since from a professional point of view "skill map" seems more appropriate, this is the term used in the project. Obviously, the term "competence map" can also be used, although when it refers to a more general and less academic scope.

3.2.2 An overview of the skill maps evolution

There are a lot of skills maps. These skills maps change along the time and incorporate new skills or discard those that become obsolete. However, after the studies carried out by the project partners, the situation is the following:

³ Questions/publications

⁴ Academia found the number of followers/and number of pages (in the case of publications)

⁵ LinkedIn do not allow to search a sentence between "", but the result can be considered significant because the number of results is lower.

⁶ Eurostat do not allow to search with a sentence between "", so that, the method used was use google with the key "site" for example: "competency map" site: <http://ec.europa.eu/>. results are not significant because google finds repeated files (as images or pdf files, for example)

⁷ Proposes "competence mapping"

⁸ But Scholar recommends to use "competency map"

⁹ Google suggest "competency map"

¹⁰ But Scholar recommends to use "competencies map"

¹¹ But google suggest "list of competencies"

¹² Google suggest "list of competencies"



1. New skills maps appear continuously.
2. The new skills maps do not make obsolete those that already exist. Normally the new skills maps incorporate soft skills that appear in the existing skills maps.
3. Two kind of new soft skills appear:
 - a. New soft skills can be considered the evolution of an existing soft skill. For example, "helicopter view" can be associated with "analytical thinking".
 - b. New soft skills can be considered part of several existing soft skills. For example, the ability to delegate is a form of leadership and time management.

It is not the objective of this project to formalize soft skills from a psychological point of view, but it is possible that the framework of this output allows the natural evolution of soft skills to be absorbed. To know the evolution of these maps, the framework must consider the evolution of the skills maps along the time. Figure 2 shows the set of hard and soft skills that a person needs and how they evolve over time. The variables involved in this process are:

- The needs of the organization. It should be considered that a person can change the organization where it works which will imply a change of skill map.
- The technical needs of the project in which the person participates. Changing the project, even in the same organization, can mean a change of some soft skill. For example, if you work on databases in project 1, hard skill 2 (database programming) will be necessary. But if project 2 and project 3 are mobile application audit projects, hard skill 2 will be no longer necessary, but the need for hard skill 1 (systems analysis) will appear.
- The soft skills needs of the project in which the person participates. For example, if a person coordinates project 2, he will need "leadership" (soft skill 1), but if he is a programmer in project 1 and 3, he will need "order and clarity" (soft skill 2), basic to write code readable.



These two time-varying dimensions (horizontal axis) become the needs of the competence maps.

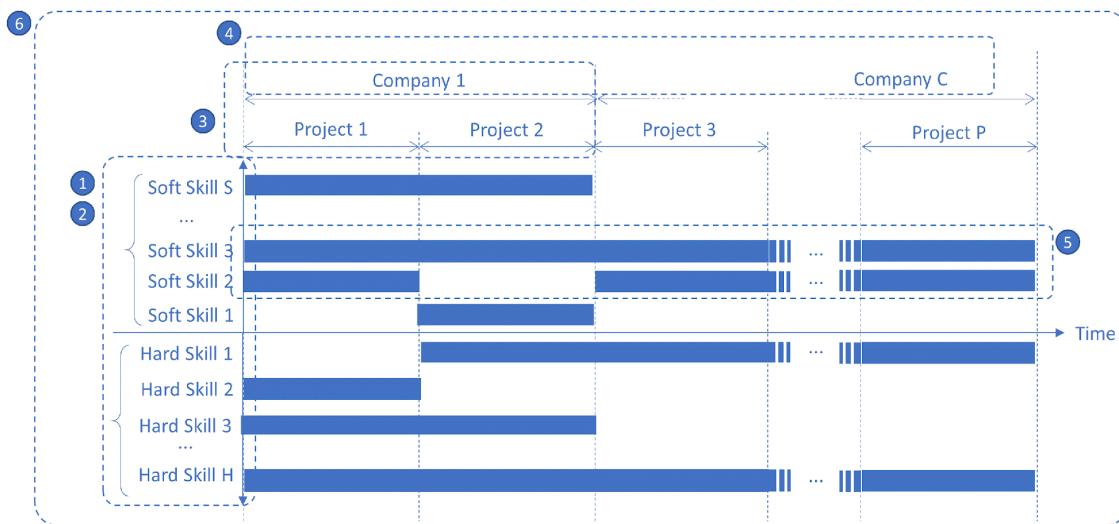


Figure 4. The evolution of skills. Hard and soft skills must be considerate together to understand the framework.

In the figure, some interesting questions can be deduced that the framework that will be developed in this Intellectual Product should provide.

1. Do the “Soft Skills” have the same characteristics as the “Hard Skills”? (For example, is there Core Hard Skills?) Are they maintained along the time with the same frequency? Is the same number required on the “Soft / hard Skills maps”?
2. Is it possible that there are “soft skills” directly related to other “hard skills”?
3. Is it possible to establish a map of “Soft Skills” or “Hard Skills” depending on the type of project?
4. Is it possible to establish a map of “Soft Skills” or “Hard Skills” for the organization depending on the type of projects it carries out?
5. Is it possible to determine the set of “Hard / Soft skills” that remain constant (or necessary) over a certain time (or as long as possible)? (CORE Hard / Soft-Skills)
6. Is it possible to characterize the entire context related to H/S-Skills? (UML, parameterization for calculations of minimum or maximum number of H/S-Skills per person, project, company, etc.)

These questions will be addressed in the various meetings between teachers, students and representatives of the socio-economic environment of each project partner.

3.2.3 Main skills maps sources

To determine which competency maps can be analysed or considered for using in an organization, the search for map sources was performed. It has been decided to separate



between soft skill sets provided by Europe and soft skills sets provided by organizations. Table 1 shows the sources of soft skills most used in the European environment.

| Skill map | URL |
|---|--|
|  | https://ec.europa.eu/education/policy/strategic-framework/skills-development_en ESCO https://ec.europa.eu/esco/portal/home |
|  European Centre for the Development of Vocational Training | www.cedefop.europa.eu/en (Cedefop has established European Qualification Framework (EQF), a system with eight levels of learning outcomes) |
|  | https://ec.europa.eu/eures/public/homepage |
|  | skillspanorama.cedefop.europa.eu/en |
|  | http://www.ecompetences.eu |
|  | http://www.eucen.eu/ |
|  | http://disco-tools.eu/disco2_portal/ |

Table 2. Official skills maps repositories or sites that uses skills maps in a permanent way

Regarding the professional environment, the following main sources were found:

| Skill map | URL |
|---|---|
|  | https://www.esoftskills.com/ |
|  The Next Generation of Skills Assessment | www.eskill.com |



| | |
|---|---|
| | www.skillsurvey.com |
| | https://www.conovercompany.com |
| | https://www.skillsyouneed.com/ |
| | www.easyrecrue.com |
| Competendo - Tools for Facilitators | http://competendo.net/en/Transversal_or_Key_Competences |
| | http://searchcio.techtarget.com/ |
| | http://study.com/academy/lesson/what-are-soft-skills-definition-examples.html |
| Driving Organisation Effectiveness through People | http://www.talentalign.com/skills-vs-competencies-whats-the-difference/ |
| WikiJob | www.wikijob.com |
| | http://resources.hrsg.ca/ |

Table 3. Professional skills systems

These repositories or sources of maps of soft skills are of special utility to be able to verify how the evolution of the maps is especially interesting as a field of investigation.

3.3 Soft skills maps analysis

Reviewing of the skills maps named in the previous chapter indicates that an enormous quantity of titles are used in the discussion regarding soft skills and competences. When only talking about 'soft skills', we can find a number of close-to expressions such as 'transversal skills', 'social skills', 'employability skills', 'generic skills', '21. century skills' and 'emotional intelligence'. It is also evident that specific professional fields have their own special terminology. For instance, authorities in the educational sector speak about 'transversal skills', while labour administratives use the word 'employability skills', yet meaning mostly same skills. Psychologists use 'emotional intelligence' while the health care sector uses 'social skills'.



This might be confusing for the actors involved in the development of soft skills, and partly this multiplicity of titles might form an origin to the so-called skills gaps between educational institutes and working life. A skill gap means that graduates/employées have lacks in their skills in respect to the skills needed in a working position or working environment. An additional origin to skills gaps is that educational institutions normally have a deficient awareness of the essential individual skills needed in the working positions of their fields. An old truth says, "You can not develop something you can not name", and in especial, this is the case when we are talking about soft skills.

As one of the prominent goals of the CoSki21 project was to bridge the skills gap between higher education institutes (HEI) and organizations, a clarification regarding the terminology and attributes related to soft skills was considered as a critical step. This step is important for the educators in several senses. First, they must know which skills are important, but they also have to identify the skills exactly in order to include them in curricula, plan learning measures and environments and finally to assess these skills. As for organizations, and especially their HR departments, it is important to define the skills needed in different work positions in order to recruit people with adequate skills. Secondly, this knowledge is needed in order to detect methods to foster these skills in their staff.

For these reasons, a survey was made with the aim of reviewing the multiplicity of titles used in the 'soft skills' context. Consequently, we wanted to find out the most commonly used skills and sort and structure them in clusters.

3.3.1 Data collection

Sources were sought in internet search by using search words 'soft skills categories', 'soft skills classification', 'transversal skills categories', 'transversal skills classification', '21. century skills categories', '21. century skills classification', 'employability skills categories' and 'employability skills classification'. The criteria adapted to the sources was that they express clearly particular skills (not skills groups) that can be interpreted as soft skills.

By the end of 2017, 30 skills maps have been found, which could be structured in four groups:

- ❖ scientific articles
- ❖ European Community projects
- ❖ non-profit organizations
- ❖ HRD companies

The number of particular skills included in the maps varied remarkably, from five skills up to to 82 skills. A total of 195 soft skills have been obtained.



Figure 4 shows in detail the sources found (horizontal direction) and the titles included in them (vertical). Accordingly, the density of each skills was summed up in order to detect the most commonly used ones.

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | X | Y | Z | AA | AB | AC | AD | AE |
|--|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|----|----|----|----|----|
| 1) Scientific literature 2) European Community projects (TUNING, AMIGO, ESCO,...) 3) Non-profit organizations (OECD, Cedefop, World Economic Forum,...) 4) Companies/Consultancy reports (Ernst & Young,...) 5) Practice-based Organizations (Barcelona ATM; Cité des Métiers,...) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1) link not found | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2) Year of last version | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3) Authors | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4) Skills | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5) Sources | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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Figure 5. Screenshot of the spreadsheet with the analysis done

The use of a spreadsheet stored in Google Drive is justified because all partners must access simultaneously in order to do their contributions and coordinate the analysis.

3.3.2 Data analysis

The ten most commonly used soft skills in the search are listed below. In brackets the number of hits founded is announced. As we can see, spoken and written communication were listed separately. If we would treat ‘communication’ as one soft skill, this would be very clearly the most commonly named skill.

- ❖ creativity and innovation (16)
- ❖ problem solving (14)
- ❖ team working (14)
- ❖ leadership (13)
- ❖ spoken communication (13)
- ❖ written communication (12)



- ❖ self-management (10)
- ❖ analytic thinking (9)
- ❖ critical reasoning (9)
- ❖ ethicality (8)

The original [spreadsheet](#) includes all details of the analysis.

3.4 Main considered maps

After the review of the main maps, it was checked whether these maps could be considered representative to establish the project framework. For that, the maps of well-known competencies by the partners were reviewed. These maps are reviewed below

3.4.1 MOSSA

The project MOSSA (THE MODEL OF SOFT SKILLS ASSESSMENT - The evaluation of soft skills of medium-high skilled migrants). More information about the project can be obtained from: <http://valorize.odl.org/>. This project is one of the starting points of CoSki21 because MOSSA implicitly has focused on the Core Skills for migrants. Soft Skills map considered in MOSSA is the next.

| Group | Soft Skill |
|----------------------------|----------------------------------|
| Navigate the world of work | Adaptability and flexibility |
| | Motivation |
| | Managing responsibility |
| | Time management |
| Social Skills | Communication skills |
| | Team working |
| | Conflict management |
| | Service skills |
| Achieving results | Decision making |
| | Problem solving |
| | Creativity and innovation |
| | Critical and structured thinking |

Table 4 MOSSA Skills map

MOSSA is especially interesting because it proposes a focus on soft skills in three dimensions. This aspect will be considered as basic for the analysis of skill maps and as a base element in the questionnaire.





3.4.2 Universitat Politècnica de València

MOSSA is a specific map of competencies for immigrants. It is a good starting point for Core Skills. However, it is interesting to extend, or expand, MOSSA with a map oriented to the academic environment. Because of the output 2 material is related to students, the map of competencies of the coordinating University was chosen.

The Universitat Politècnica de València (Polytechnic University of Valencia - UPV) integrates the transversal competencies in the curriculum of its degrees. To do this, it proposes "competency dimensions" where one or more soft skills are grouped together to be worked by every subject. These skills are as follows. In this case, the description is given since, although MOSSA is the starting point, UPV, leading the project provides a central axis on the skills that can be tested with its students. The soft skills considered by the UPV are detailed below (all details can be obtained by <http://www.upv.es/contenidos/COMPTRAN/>, the code CT means Transversal Competence).

- CT-01. Comprehension and integration. Understanding means "perceive and have a clear idea of what is said, done or happened or discover the deep meaning of something." To demonstrate that something has been understood, the person identifies and retrieves the information and explains it in their own words, interpreting and integrating the ideas from their own perspective.
- CT-02. Application and practical thinking. The student, in real life, needs to be prepared to face situations in which it is not enough to apply recipes or formulas and in which the proposed decisions or solutions must be argued and accommodate the available resources. In this sense, this competence develops the way of thinking directed to the action, which allows to adapt to new situations, make decisions and, consequently, ACT.
- CT-03. Analysis and problem solving. Problems are new situations that require individuals to respond with new behaviours. Solving a problem involves performing tasks that require more or less complex reasoning processes and, in many cases, not simply associative and routine action. The objective of this competition is for the student to be able to apply structured procedures to solve problems, thus promoting their ability to learn, understand and apply knowledge autonomously
- CT-04. Innovation, Creativity, and entrepreneurship. Innovation is understood as the ability to respond satisfactorily to personal, organizational and social needs, modifying processes and / or results to generate new value. In turn, the development of this competence requires, both to think in a different way to provide different perspectives (creativity), and to commit certain resources on their own initiative, in order to explore an opportunity, assuming the risk that this entails (entrepreneurship).
- CT-05. Design and Project. A project is an effort that is carried out in a certain time to achieve the specific objective of designing and creating a unique service or product, by performing a series of tasks and an effective use of resources. The development of this competence favours the student to learn by making and integrating knowledge and skills



from different disciplinary fields, developing high-level intellectual skills, promoting learning and autonomous work, teamwork and self-assessment.

- CT-06. Teamwork and leadership. Teamwork involves creating and developing a climate of mutual trust between the components that allow working in a responsible and cooperative manner. The most appropriate term to describe this situation is to SHARE: share knowledge, commitment and responsibility. It involves the distribution of tasks and roles and respect for the rules and rules established by and for the group.
- CT-07. Ethical, environmental and professional responsibility. This competence refers to the set of knowledge, skills, abilities and attitudes, useful for interacting with the environment, in an ethical, responsible and sustainable way, in order to avoid or reduce the negative effects produced by inappropriate practices caused by human activity and to promote the benefits that professional activity can generate in the environmental field, taking into account its economic and social implications. Ethical responsibility refers to orienting human action in a rational sense, as it relates to actions and their moral value. Environmental responsibility is the capacity to decide of a positive or negative assessment for the ecological impact of a decision and generally refers to the damage caused to other species, to nature or to future generations, by the actions or non-actions of another individual or group. Professional responsibility arises, at this point, as included within the moral responsibility, reaching within our conscience and with two primary objectives: to avoid any voluntary offense and to reduce, as far as possible, the number of involuntary offenses due to human weakness, weakness own or negligence of others.
- CT-08. Efficient Communication. Communicating effectively means having the ability to transmit knowledge and express ideas and arguments in a clear, rigorous and convincing manner, both orally and in writing, using appropriate resources appropriately and adapting to the circumstances and the type of audience. It is important to differentiate two dimensions within this competence: oral and written communication.
- CT-09. Critical thinking. Critical thinking goes beyond the skills of logical analysis, since it involves questioning the underlying assumptions in our usual ways of thinking and acting and, based on that critical questioning, being prepared to think and does differently. Critical thinking is the thinking of the questions: why things are like this? why things cannot be otherwise? why do you think they are like that?, etc. Consequently, we will say that a person has developed it to the extent that he questions himself about things and is interested in the foundations on which ideas, actions, valuations and judgments both his own and those of others are based.
- CT-10. Knowledge of contemporary problems. This competence refers to the need for students to understand contemporary political, social, legal and environmental issues and values, as well as the mechanisms for expanding and disseminating knowledge. It is about developing the ability to "keep up" with current events in their field of knowledge and in society in general. In order to work on this competence, training scenarios must be sought in which students discuss this type of questions in depth, being able to



summarize the most relevant aspects and defend a position on it. Similarly, it is very important that they learn to assess complex situations using different approaches, such as: economic aspects, quality of life, and environmental impacts, local and national policies.

- CT-11. Permanent learning. This competence is closely related to the idea of training reflective professionals, who do not settle for routinely reproducing known solutions, but rather seek to generate new solutions or solutions adapted to new situations. Reflective practice is based on three pillars: action or know-how; the knowledge we develop over our own knowledge and the control we have over how we use our knowledge in a specific activity.
- CT-12. Plan and time management. This competence implies being able to correctly organize and distribute the time we have and distribute it according to the activities necessary to achieve our objectives in the short, medium and long term.

The map of competencies shown above is used to evaluate the students of the University. Because of it is elaborated in terms of competency dimensions, an analogy between competency dimensions and transversal competences can be made. The result can be seen in next table.

| UPV Soft Skill Dimension | UPV Soft Skill |
|--|--------------------------------|
| Comprehension and integration | Structured thinking |
| | Integration capacity/thinking |
| Application and practical thinking | Customer Orientation |
| | Practical thinking |
| Analysis and problem solving | Analytical thinking |
| | Synthesis thinking |
| Innovation, Creativity, and entrepreneurship | Innovation capacity |
| | Creativity / Creative thinking |
| | Entrepreneurship |
| Design and Project. | People management |
| | Goal orientation (project) |
| Teamwork and leadership | Teamwork |
| | Leadership |
| Ethical, environmental and professional responsibility | Responsibility |
| | Self-control |
| Efficient Communication | Communication |
| | Empathy |
| Critical thinking | Critical thinking |
| Knowledge of contemporary problems | Motivation |
| | Strategic orientation |
| Permanent learning | Permanent learning |
| Plan and time management | Plan and time management |

Table 5. UPV Competence dimensions and soft skills related



The previous analogy was made by the project members. The fundamental criterion was to use terminology related to the analysis performed so that the terms were assimilated to the most frequent.

3.4.3 Soft Skills Maps Composition

Once the maps have been reviewed, and verified that MOSSA is a good starting point, and UPV is a good example of a complete map that covers a large number of degrees. Since another of the objectives of the project is to determine the most appropriate soft skills and their characteristics in order to determine the framework, the skills maps used and their relationship are analysed below, both for companies and for students.

| MOSSA | UPV Soft Skill | Proposed Framework |
|----------------------------------|--------------------------------|-----------------------------------|
| Communication skills | Communication | Communication |
| | Empathy | Empathy |
| Team working | Teamwork | Work in team and cooperation |
| Time management | Plan and time management | Planning and organization |
| Managing responsibility | Responsibility | Responsibility |
| Creativity and innovation | Innovation capacity | Innovation capacity |
| | Creativity / Creative thinking | Creative thinking |
| Critical and structured thinking | Critical thinking | Critical thinking |
| | Structured thinking | Order and quality |
| Problem solving | Analytical thinking | Analytical thinking |
| | Synthesis thinking | Conceptual thinking |
| | Practical thinking | |
| | Integration capacity/thinking | |
| Service skills | Goal orientation (project) | Goal orientation |
| | Customer Orientation | Customer Orientation |
| Motivation | Motivation | Initiative |
| | | Self-confidence |
| | Permanent learning | Learning and use of knowledge |
| | Entrepreneurship | Entrepreneurship |
| Conflict management | People management | People management |
| | Leadership | Leadership |
| | Self-control | Self-control |
| | Strategic orientation | Strategic orientation |
| Adaptability and flexibility | | Flexibility and change management |
| Decision making | | Decision making |
| | | Commitment to the organization |
| | | Negotiation |
| | | Networking |

Table 6. CoSki21 skills framework proposed.



Based on the two maps analysed, it is proposed to add the following soft skills not previously considered:

- Commitment to the organization. Due that this project is based on the detection of the core skills for an organization, this aspect is really important.
- Negotiation. Due that usually the academic-based soft skills maps focus in thinking skills, some important aspect in the XXI socio-economic environment as the ability to optimize the agreements must be considered.
- Networking. This last soft skill is one of the classical "forgotten skills". Currently social media and transmedia environment force people to have their own personal brand. This brand needs a complex contact-based network. The ability to obtain contacts and maintain them active is one of the necessary soft skill.

3.5 The role of the communication: towards a taxonomy of Soft Skills

When thinking about soft skills, organizations generate their map of competencies and ask universities or VATs to teach soft skills. However, one of the most complicated aspects is to organize the teaching of soft skills. Part of this project is born because it is necessary to determine a European framework, and this framework starts from the teaching of soft skills to future employees.

The syllabus is the starting point to organize the teaching. Teachers should know which blocks are those that link similar soft skills. These blocks are usually called thematic blocks, units or simply themes. When the content to be organized is based on hard skills, the thematic blocks are simple to obtain and sequence. For example, it is easy to place the sum in a thematic block of operations. In addition, it is easy to determine that to learn to multiply, one must first know how to add. Consequently, multiplication will be a content to be learned after the sum.

Unlike hard skills, soft skills do not necessarily depend on each other sequentially. There are cases in which a "personal" soft skill is recommended to develop a "social" soft skill. For example, empathy. It is necessary to have it to develop the assertive communication soft skill. Time management may be more related to self-control, but it also requires certain hard skills, such as knowledge of agenda tools.

The fact that the sequencing and grouping of soft skills is complex, leads us to the fact of having to make a specific taxonomy to be able to organize their teaching. Soft skills can be clustered in various ways. After several meetings with the stakeholders of each of the partners, it was decided to adapt a model created by the UPV subject "Soft Skills" teachers (project coordinator and project research that belongs to the UPV team in CoSki21), and modify it by the project components.



| Principles | Taxonomy levels | Visual description | The role of communication |
|---|--|--------------------|--|
| Based on the social principles of respect (by priority) | | | |
| Respect yourself (do not hurt yourself) | Level 1: Personal self improvement | | The communication is with oneself. Self Knowledge is necessary |
| Ask anyone respect you and vice versa (do not allow anyone to hurts you and vice versa) | Level 2: Personal relationships | | The communication is with a person, face to face. |
| Ensure that other person respects others (do not allow anyone to hurt others) | Level 3: Personal interrelations: working with persons | | The communication is interpersonal, in daily work. |
| Try to optimise that other person work in the benefits of others | Level 4: Leadership and management | | The communication is personal, but goal-oriented. |
| Respect unknown people | Level 5: Personal branding | | The communication is oriented to unknown people. |

Figure 6. CoSki21 Soft Skills Taxonomy proposed.

3.5.1 Level 1. Personal self-improvement skills

The first level is made up of skills that require communication with oneself. These skills allow to improve as a person in individual actions. The results of applying these competencies directly affect the person. The clearest example, and possibly the most necessary level 1 soft skill, is self-control. As a control system, and by analogy with control engineering, self-control requires hard skills to "sensor" situations and to "act". In this case, the sensors are the knowledge of oneself as a person, this is where communication with oneself is necessary. In the case of acting, it implies having the capacity to do what must be done. The latter is related to will and motivation. The processing part between sensing and acting implies very interesting cognitive reasoning.

It is not the objective of this project to study the psychological aspects of self-control, but one of the first conclusions of the participants in the meetings and work sessions is that introspection should be encouraged much more in aspects of studies or work.

Some Soft Skills that can be included in this category are: resilience, creativity, even all types of thinking (critical, practical, applied, etc.), order and quality, goal orientation, initiative and responsibility.

3.5.2 Level 2 Personal relationships

This level is focused on the skills that allow direct person-to-person communication. It includes both incoming communication, knowing how to listen, and outgoing communication, knowing



how to communicate to a person, not to a team or to a multiple audience. This level is key to the employment relationship, since it enters the territory of personal relationships. Two good professionals may have conflicts because they are not experts in soft skills at this level.

As in the previous level, in this there is a key soft skill: empathy. The ability to understand another person is important so that your messages are not misunderstood. It is also key to communicate in a record that is understandable to the other person.

Some soft skills of this level are: empathy, assertiveness, customer orientation, or commitment to the organisation.

3.5.3 Level 3: working with people

The third level enters the most classic soft skills. In this case, it is about how you communicate with other people, but it is no longer with one, but with a team. It is necessary to distinguish this level from the next. In this case, it is the soft skills in which communication is continuous, in which the common goal is necessary.

Like any hierarchy, the necessary soft skills are those of the two previous levels, but considering that the key soft skill is flexibility and change management. It could be considered that teamwork is the necessary soft skill. However, teamwork is the objective of this level, not the medium.

Some soft skills of this level are: teamwork, cooperation or negotiation.

3.5.4 Level 4: targeting people

The fourth level is another of the classic levels. This level is no longer oriented to common work, but to direct such work towards objectives. Clearly, the key skill of this level is leadership. As we know today there are many types of leadership. Therefore, talking about leadership at this level is like talking about teamwork at the previous level. Leadership is the end of the level, not the medium. Some soft skills of this level are planning and management, decision making, people management or strategic orientation.

3.5.5 Level 5: unknown world

the last level is different from the previous four, since the people with whom it interacts are not known, or the continuous relationship of the previous four levels is not available.

The key soft skill of this level is personal branding. This level consists of knowing how to start relationships, knowing how to move in unknown environments. This level can be considered an extra to the previous four. However, in an interconnected environment like the world 4.0, the ability to offer a sincere, real and adequate image to the soft skills that are possessed is essential. This is why the output 4 of the project emphasizes using media such as the portfolio or the video curriculum to demonstrate the soft skills that are possessed.

Some soft skills of this level are entrepreneurship and networking.



4 Soft Skills for entrepreneurs' students

The first thing we need to know is what an entrepreneur is. It can be understood as the person who starts a new business or task innovating. Let's analyse the meaning a little more: according to the dictionary, the verb undertakes means: "To start doing a certain thing, especially when it requires effort or work or when it has certain importance or importance". In addition, the entrepreneur is the person who: "designs, launches and puts into operation a business, starting from an innovation. The entrepreneur is an entrepreneur of innovation; in addition to launching the company, he opens a new business line, his creativity opens the doors to other entrepreneurs and to other new products."

It is very difficult as an entrepreneur to be isolated entities that simply carry out their activities. Teamwork, collaboration and the ability to interact in a "multi" way is vital: multidisciplinary, multiracial, multi-social, etc. To have the quality to know how to cultivate relationships and generate new business links that can bear fruit in allies or clients.

Interpersonal skills are competencies that are worked and harvested throughout life. That is why within the work as a businessman and as a fundamental part of strategic planning is recommended stimulation for care and personal improvement. Although as businessmen the day does not seem to have enough hours to perform courses or personal activities, see it as indispensable, as part of the human essence of the company. Think that if the entrepreneur and those who work in the company are well, they feel: motivated, optimistic, happy with themselves, etc. and this will become value that is transmitted directly to the environment. Which can generate the differential before the competition and thus enter the memory of people.

Within soft skills, adaptability to the environment and a positive attitude to learning are essential. Think that with the times, it is important to anticipate the market, have an open mind to innovate, forge humility, empathy and confidence for the generation of new ideas.

So, what does an entrepreneurial student mean? Are all the student's entrepreneurs? For Burges¹³, a former entrepreneur student at Stanford University, higher education is the ideal stage to explore ideas and turn them into a business. "Students have less to lose. They don't usually have mortgages or families to worry about and distract them from their potential business," he says. According to him, there are five very important points that every young entrepreneur should keep in mind as he pursues his dreams:

1. Daring. According to Burges, most students believe that there is something preventing them from developing their idea, when in fact nothing stands in their way, it is just fear.

¹³ <http://www.educacionfutura.org/caracteristicas-de-un-alumno-emprendedor> (accessed may 2019)



2. Planning. You can never be too prepared. Be sure to check all angles and scenarios, internal and external. Many online business tools can help you build your project.
3. Preparation for failure. The media is full of stories of successful entrepreneurs, but remember that many others also failed. Having an alternative plan is a good idea, as it knows when to walk away. Never put your future at stake for an idea that, despite all efforts and means, has not worked.
4. Zero concerns Stress can have an impact on health and well-being, so creating a good balance is vital. If the pressure takes hold of you, back off and take a break. Look at what is causing the problem and make the necessary changes.
5. Learning from experience. It studies what successful entrepreneurs did to achieve their goals. It also investigates projects that did not succeed: what they did wrong. With the available information, you will be able to build your own list of what and whatnot.

Is it possible to be an entrepreneur within a company or at the university? Of course, it is known as "intrapreneurship", the one undertakes within an organization. Intrapreneurship is the act of behaving like an entrepreneur while working within a large organization. Intrapreneurship is known as the practice of a corporate management style that integrates risk-taking and innovation approaches, as well as the reward and motivational techniques, which are more traditionally thought of as being the province of entrepreneurship.

4.1 The importance of soft skills in entrepreneurs

Great leaders and entrepreneurs know that "soft skills" are the most difficult to acquire, but the most important for their business. Soft skills are those skills, habits, and behaviours that distinguish us as a professional and that make the difference when undertaking a project, solving a conflict and relating to others. Leadership, productivity, team management, sales and communication skills are among the most valued soft skills for an entrepreneur.

To give us an idea of the importance of these skills we can ask ourselves what would have happened if Steve Jobs had not developed his persuasion and leadership skills, or if Warren Buffett could not delegate with responsibility, or the Dalai Lama had not had his charisma to communicate.

The ability to start new businesses requires constant learning of these skills to develop the project that each one builds. A business plan is not enough. An entrepreneur needs something more if he does not want to fail. He needs that capacity for leadership or synthesis, autonomy, responsibility, critical vision... Moreover, these are just a few examples.

As entrepreneurs, businesspersons or executives, it does not matter what concept you want to use. The development of these skills will allow you to generate suitable environments to promote your project. You need to know which are yours and how you can improve them. You need to know what makes you different. Because entrepreneurship is another way of learning. Day by day, we will be filling our luggage with new knowledge but it is important that from the



starting point, we are equipped with the best soft skills that drive our project. Everything adds up.

Are Soft Skills important for Entrepreneurship? As the IED Institute of Entrepreneurship Development says, “being an entrepreneur is a little bit different than being a business owner. You want to work with your customers and clients. You want to show them that this is not just a professional “relationship”. You want to build on your products and all your services; you do not want to enforce them to people. You want your customers to see you not your product. You have to be communicative; you have to be ready to cooperate with them. You have to make them feel comfortable and familiar with what you have to offer.

Another great difference between start-up companies and old type businesses is the fact that, old type businesses were actually based on a very standard business plan that, the owners and all the employees have to follow to the letter. Taking chances and risks was not something that all companies used to do. As a young entrepreneur however, you will be facing a lot of competition. Taking risks is a necessity. Do not be afraid to try. After all, your entire endeavour is based on an idea and a vision. Unless you take risks, you will never be able to bring that vision to life.

If you are the owner of a company, you expect your employees to work a full eight hours and deliver the work they are getting paid for. What goes on in their heads is not really your business. What matters is the result. This is most certainly not the case when it comes to start-up companies today.

You need to be able to help your employees deal with any kind of stress they might have. When employees are calm, they are most certainly able to deliver 100% of what they are responsible for. You need to make sure that, people working for your start-up will know that they can trust their boss and that, their working environment is a pleasant place to be. Help them deal with the stress and give them a chance to get to know you and trust you.

Do not make the mistake of thinking about your clients like a simple network that you need to create. They are not objects. They are not just wallets that will open up in order to give you their money. Nowadays, people do not just purchase things without thinking about it first. They want to be able to know that they could trust the company that creates the products and the people behind the desks. If you want your start-up to be a success then you need to make sure that, you will create a “friendship” between you and your customers/clients not a faceless relationship.”

"The important thing is not in what competences you have, but in the combination of them", adds Elena Ibáñez, from Singularity Experts. "That's something I've discovered with my project. What good is it for a potential entrepreneur to have a high degree of boldness if he has a lot of



dominance? Alternatively, for him to be open to change if his pressure is very high? It is in the combination when you are really optimal to undertake"¹⁴.

Be a leader not a boss. The more the employees trust the leader, the more they like him as a person, the more likely they are to actually want to really work for him. The leader does not want to be a person that will force the employees to work. He will want to be that person that will empower them, give them reason to work other than just the salary. He wants to make sure that his employees will know he is trying to make a difference and that, as a team, he will be able to achieve great things. Being their leader not the person that bosses them around¹⁵.

Are the soft skills for entrepreneurship different from the soft skills of the activity to be undertaken? What do I need to learn in order to become an entrepreneur? You need a technical knowledge base, with a focus on how to sell, and a layer of personal skills, among which resilience stands out. "Training and learning are the raw material of the entrepreneur. Much more than money or ideas," says Mike Cobian, general partner of The Valley Venture Capital, a start-ups investment fund set up by The Valley business school. "There are millions of humans thinking about ideas all the time, the important thing is execution. And that's based on talent and training".

To be formed, of course, but in what? Beyond the concrete field in which each project wants to develop, there is a body of transversal notions that are necessities. And with a duality that is also a constant in the labour market: that of hard or technical knowledge, on the one hand, and soft or personal skills, on the other.

4.2 Soft skills for entrepreneurship

We are going to develop the most important soft skills for the entrepreneur. It is not about having all of them, but rather having an important mix of most of them. Many must have worked on the personal journey and others on the professional one.

1. Initiative. To have initiative is to face new situations flexibly, to present resources, ideas and innovative methods, concretizing them in actions tending to create a new order. The initiative is essential to take the step forward and start a business or idea, is not to be afraid, and is to dare. Without these soft skills, it is very difficult to undertake. Initiative to work independently, take the first step, be adventurous and be willing to employ new methods.
2. Leadership. Leadership is a quality that entrepreneurs must develop: being a leader has to do with the ability to influence others and support them to carry out tasks to achieve a common goal. To demand and to point is easy, the difficult thing is to put the example that is the work of the leader. To be a good leader, you must know the team.

¹⁴ https://elpais.com/economia/2019/07/29/actualidad/1564407764_779627.html (Accessed July 2019)

¹⁵ <https://ied.eu/project-updates/basic-soft-skills-every-startupper/> (Accessed April, 2019)



3. Negotiation. Without sales, there is no business, and as you are sold, you are treated, under these premises you must work the posture when negotiating and selling. The best result of a negotiation is win-win, at least that is what most specialists on the subject agree on. Nieremberg assures that negotiation is an undertaking that is made in cooperation, that it is not "a game", and that in every good negotiation someone has to win something.
4. Networking. The way someone presents himself or herself, says goodbye or starts a conversation is the key when starting a business, effective networking can lead to levels that few people can imagine, most entrepreneurs who attend networking events go unnoticed and lose a gold mine in contacts and relationships. Networking is important and necessary to expand opportunities for professional and business growth. Networking means increasing your network of professional contacts. Without contacts, there is no business.
5. Communication. It is crucial for an entrepreneur; to transmit the content of an idea or a product to a group of people in the environment they develop, customers, employees, other companies. The entrepreneur must be aware of the importance of effective communication as an element of business strategy, and competitive improvements of the company. To be an effective communicator it is important to take into account that we all perceive the world differently.
6. Creativity. Creativity is necessary, at a large and a small scale, because starting from scratch and with little money demands to be imaginative in every detail. In addition, the changes throughout the exercise imply many gifts of imagination to be able to face the different unexpected challenges that have to be faced. Special value will be given to a person who is capable of adding value to his or her work project. Someone who knows how to make proposals, who thinks of alternative paths to the usual ones and is able to get excited with them and infect them.
7. Plan and organization. Do not confuse being busy with being productive. Have you ever spent days going from meeting to meeting, but at the end of the day, you feel like you have not made a single step forward? Sure, that is why it is crucial to work on personal productivity. Being a hyper-productive person, in addition to allowing you to optimize your time, will really help you achieve the full success that most people do not have.
8. Teamwork and cooperation. Collaboration is essential, as the team is key to getting a project off the ground. The idea is worth what it is worth, but the fundamental thing is to know how to develop it and to know which team to develop it with.
9. Self-confidence. The key to entrepreneurial success! It believes that you are capable of achieving the objectives you set yourself. When we talk about trust is to believe that everything will be fine, that despite there is a margin of error, and success is most likely.
10. Self-control. Self-control allows a person to make wise decisions, avoid the temptation of counterproductive or inconvenient actions, be able to withstand difficulties, have sufficient lucidity in times of crisis, make use of emotional intelligence to adapt to a changing environment and achieve goals.



11. People address. The entrepreneur will have to have management skills of people, the first thing will be to detect the needs of the company, choose the staff that best suits (develop a good selection and hiring process), have a regulation on Human Resources, generate a good working environment, congratulate workers for their achievements. Create an organization chart with which to manage the staff, analyse the jobs and generate a training plan for staff.
12. Commitment to the organization. A leader's commitment to his company is a bond based on his degree of emotional and intellectual involvement with the organization... The commitment of all, entrepreneur, employees and collaborators, contributes positively to the efficiency, productivity, satisfaction and success of the organization.
13. Empathy. Evidently, to lead a team and necessary also to convince everyone you meet along the way: suppliers, partners, investors, customers... an entrepreneur who is not empathetic is difficult to convince and lead.
14. Flexibility and change management. Effective change management will make the difference between companies that want to survive the 2020 business landscape. Leadership style, level of commitment and communication formats should not go unnoticed in times of transformation. Linear organisational structures and collaborative culture: key elements for changing the course of the company and leaving behind the old mind-set. Times of change, times of reflection invite us to prepare a new roadmap that responds to the "here and now" and that we do not forget, it expires very quickly.
15. Customer orientation. It is necessary to know the user to offer personalized experiences. In addition, this is the difficulty. Today the user is not a mass, it is an individual with specific and differentiated tastes and behaviours to whom personalized experiences must be offered, although it seems that only 10% of companies are prepared to offer this personalized experience and have the user at the centre of their strategy at an integral level. However, this path is the key to improving sales, the reputation of the company and the image of the services offered, in short, is necessary to differentiate itself from the competence.
16. Achievement orientation. Achievement orientation is defined as the effort made by people as individuals and the work team as a unit, to meet the objectives set in a project, within the expected expectations. Management in organizations requires a high sense of commitment to results. The difference between average and outstanding management lies in the ability to identify the best way to use the resources available to it and its ability to develop in the work team a routine capable of producing outstanding and differentiating results. The daily work that can lead to routine is not necessarily synonymous with boredom due to the repetitive condition of the task. This is where the importance of the sense of doing the task for which we have been hired appears.
17. Strategic orientation. In dynamic environments, organizations have to maintain constant strategic change. Their survival depends on their ability to renew models, their flexibility in responding to market impulses, that is why entrepreneurs are the engine of



the change process and those who make strategic decisions based on their beliefs about the environment, the strategy, the business portfolio and the state of the organization.

18. Analytical thinking. Analytical Thinking is an ability to understand situations and solve problems by separating their constituent parts, meditating on them in a logical and systematic way. These techniques allow improving the depth of the analysis in any aspect of the professional activity providing, to those who use them, an advantage that becomes visible in the results obtained. They are also a fast and efficient way to improve our agenda and manage time.
19. Conceptual thinking. Conceptual thinking is the use of creative, conceptual or inductive reasoning applied to existing concepts or to define new concepts. Conceptual thinking is understanding a situation or problem by assembling the parts in order to establish wholeness.
20. Efficiency and quality. Improving this competence will allow the use of resources in the most optimal way possible to achieve an objective. Quality is more than meeting the requirements. It is to deliver to customers not what they want but what they did not know they wanted exceeding expectations. The level of efficiency and quality can be improved by better organizing and planning the activities to be developed and/or innovating. Therefore, efficiency and quality have to do with the enthusiasm that is reflected in the integrity of people and how proud they are of their work. This competence is closely related to the fulfilment of commitments and the search for opportunity.
21. Learning and use of knowledge. Each entrepreneurship process is different, but the vast majority agree that you must take a key role and make decisions using your knowledge, experience, skills and intuition. You will also have to be alert to market trends and developments, so you'll have to be in lifelong learning to become obsolete.

4.3 How should students develop soft skills for entrepreneurship?

Entrepreneurial learning takes place both inside and outside the classroom, in dynamic environments where knowledge intersects with doing and creative experimentation, where students and faculty learn together through the productive application of knowledge. Although it is true that there are careers closely related to business, the truth is that in none of them will you learn how to be an entrepreneur. That is to say, you can be taught how to create a company and how to manage it, but being an entrepreneur implies the development of skills and attitudes that can only be acquired through experience.

What will be the role of Soft Skills in the classroom in order to promote entrepreneurship? What tools or knowledge drive this type of skills and what should be the role and training of new teachers? New technologies are already transforming the classroom and promoting new training methods such as Flipped Classroom or maker culture, but equally important are 'Soft Skills'.



In this sense, the impulse of vocations in the field of STEM careers is directly related to the impulse of Soft Skills. In this sense, the inclusion of robotics and programming in the classroom encourages the development of skills such as teamwork, leadership, problem solving and adaptation to change.

Is there an ideal time to train? Is it necessary to fill the backpack before or is it better to do it while walking, at the University? It depends on the route that has been done before. If you are a young student or just out of college, it is best to spend some time prior to training. However, if you are a professional with several years of experience and you already know well the sector in which you want to undertake, the best thing is to launch and, in the meantime, learn the technological leg. "Both formulas can be successful; the important thing is that it is never too late".

Entrepreneurship is a set of skills that can be taught. In a professional context where the labour market is increasingly changing, innovative projects and workers willing to take control of their own projects are increasingly valued.

The characteristics necessary for entrepreneurship at the classroom:

- Ability to take responsibility and be ready for constant learning.
- Management and planning skills to lead and implement a project from scratch.
- Ability to adapt to change and solve problems in order to carry out the necessary actions in the event of unforeseen events.
- Emotional control, self-knowledge, self-esteem and self-criticism.
- Think creatively and take risks. Have initiative and interest in innovation.
- Know how to transmit ideas and lead groups thanks to a great communicative capacity.

The entrepreneur, in short, must be a person with very diverse characteristics. The good news is that these attributes do not have to be taken for granted; they are competencies taught in the classroom. When we speak of entrepreneurial competence, we must also speak of entrepreneurial education. Entrepreneurship is the development of an attitude, and not only implies having some knowledge; it is acting proactively to make problems, opportunities.

The pedagogical methodologies to develop entrepreneurial competence are those that conceive the student as the protagonist of the teaching or learning process and the teacher as a guide. The proposals that fit into an entrepreneurial curriculum are the actions that promote interaction and participation of all, those that pose challenges and challenges close to the reality of the student body; those that stimulate creativity and initiative.

Teachers must be able to promote students' ability to communicate and solve problems on their own. In order for students to develop the desired competencies, interactive methodologies should be applied, such as problem-based learning, peer work or cooperative learning. Ideally, these entrepreneurial competences will be transversal in all subjects. It is not necessary to



create a specific subject, but to integrate methodologies throughout the academic year and work in an interdisciplinary way.

4.4 Entrepreneurs soft skills framework

In general, enterprising people, like people employed by organizations, have a very large need for soft skills. Employees need soft skills to develop their work with respect to the objectives of the organization. Skills such as teamwork, resilience, empathy, are necessary both by employees and by entrepreneurs.

Some soft skills depend on the job performed, for example a building architect must have a global and comprehensive vision of the product, an administrative must have order and clarity. An entrepreneur must have a very broad set of soft skills, since he must understand both the soft skills of his technical work, and those that his employees must have.

In addition, there are other common soft skills among entrepreneurs. Negotiation, leadership, resilience, long-term vision, are just examples of soft skills needed to undertake. As a result of meetings with entrepreneurs held under the project, the main conclusion is that an entrepreneur must have three competency maps as a priority:

- Entrepreneurship Map (approach).
 - Resilience
 - Long-term vision
 - Negotiation
 - Decision Making
 - People management
- Job position Map
- Employees in charge Map

Finally, it is important to emphasize that the other main conclusion is to propose to readers and researchers who propose projects to study which soft skills are the most suitable for undertaking. This need can be met in the European environment and thus position the member countries as innovative elements of the common economy.





5 Questionnaire to detect Core Skills

5.1 Why a questionnaire

CoSpi21 project focuses on bridging the skills gaps which are reported between educational institutions and employing organizations. In practice, this means that the level of essential soft skills should be raised in graduates and/or employees. Here several questions evolve. What are the skills that are most essential? Can soft skills be learned/taught (this question is relevant because they are not traditional substances at schools nor universities)? Whose responsibility is it to foster these skills?

The actors in CoSpi21 project believe that higher education has both a mission and a capacity to foster skills and thus provide students with skills that are needed in 21st Century organizations. But, as educational professionals, we also realize that this process includes not only one or two, but at least three stakeholders. In addition to educational institutions and students/graduates, also the employing organizations are involved in the process of personal development (Figure 5).

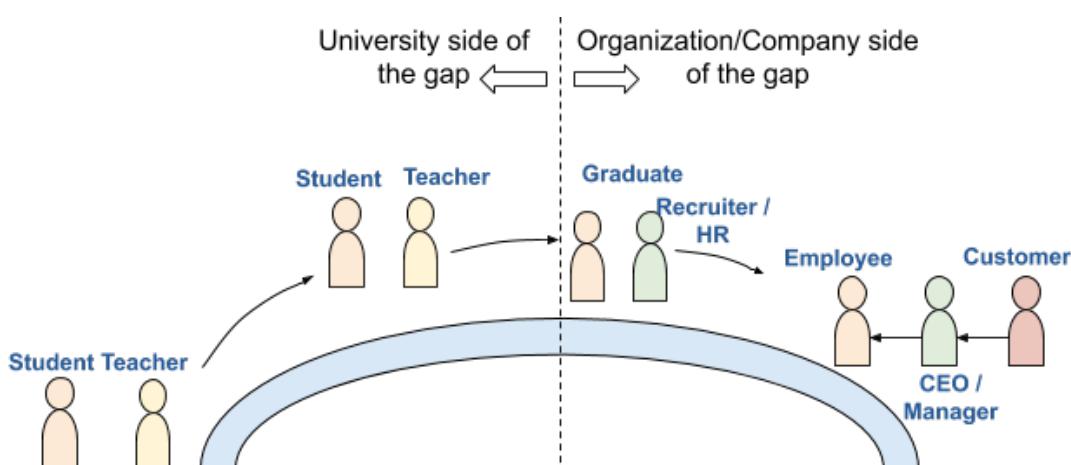


Figure 7. The questionnaire must facilitate the link between the two different European worlds: universities and organizations

5.2 Dimensions of the questionnaire

When searching for the most relevant Soft Skills for a company, different valuations should be considered (Figure 6). For *organizations and companies*, the significance of a particular skill related to specific tasks and positions is a crucial factor. This is important also because needed soft skills might vary in different positions. For instance, 'Team work' might be essential in many



work positions, but 'analytic thinking' or 'problem solving' might be still more important for an ICT system operator.

But can soft skills be learned? If yes, who should be responsible for the fostering and learning processes? As there has been discussion whether soft skills are inborn abilities or whether they can be learned (Bereiter & Scardamalia, 2006; Klaus 2009; Jones et al., 2017), the survey tool needs to consider the learning potential of soft skills. This information is highly interesting for the educators. Moreover, it measures the trust towards educational institutions responsible for fostering these skills.

Finally, what is the *graduate's or employees* level in this skill? This third angle is important, as the state or level of skills is probable to influence his/her performance in the organization. The number of skills that can be fostered is most often restricted, and if the level of a skill is high enough, then this skill is perhaps not worth focusing on.

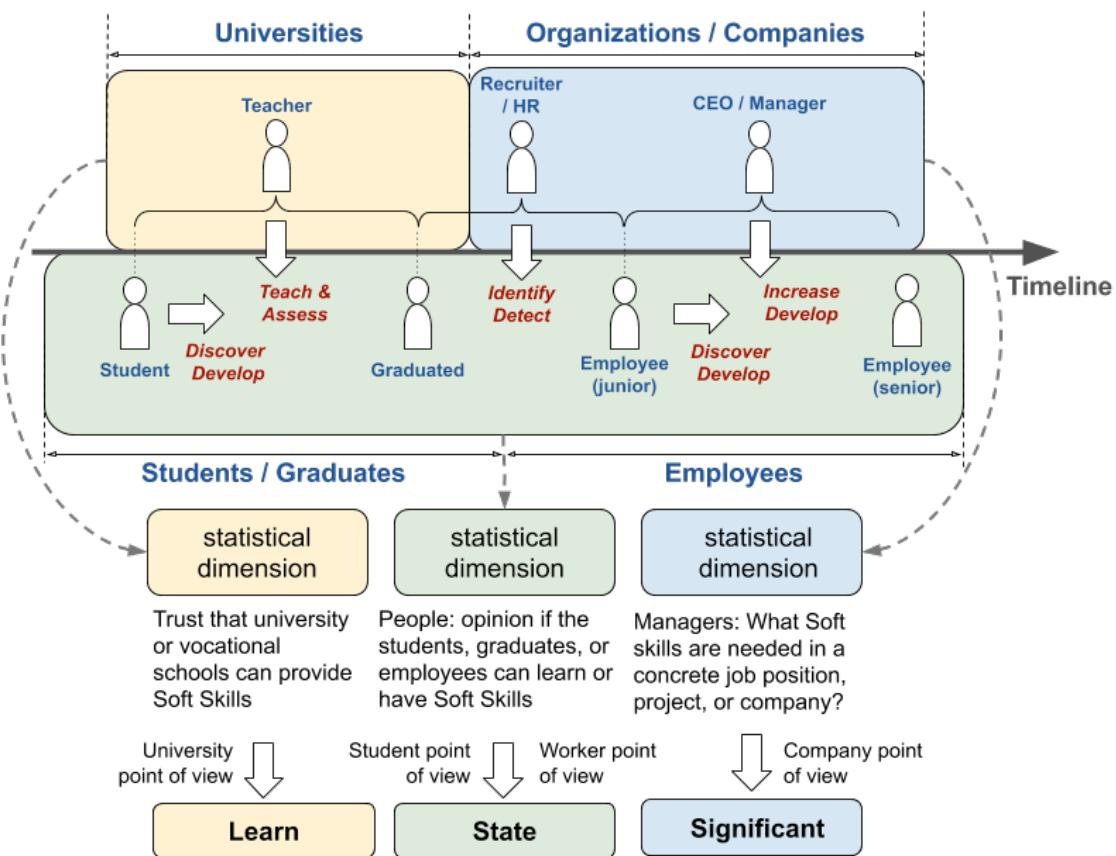


Figure 8. Dimensions used to the questionnaire and to the project framework



Operating and combining variables from these three dimensions provide needed data on the status of soft skills in any organization. This data is useful for all stakeholders as it enables not only measuring skills status, but it is also prioritizing skills according to their significance and development potential.

5.3 Questionnaire description

The focus of this research was on detecting the soft skills needed by business professionals in a certain work position. ‘Business’ covers different types of positions such as marketing and sales, accounting and administrative work, in which varying skill are needed. Consequently, the questionnaire must be able to identify the position of the respondent. For entitling the position, the ESCO (2013) system was utilized. Moreover, different fields of business branches and company types (private/public, small/medium/large) were sought. Here a simplified version of the NACE code classification was utilized, in order to declare the branch of business. (Blocks I and III in figure 7).

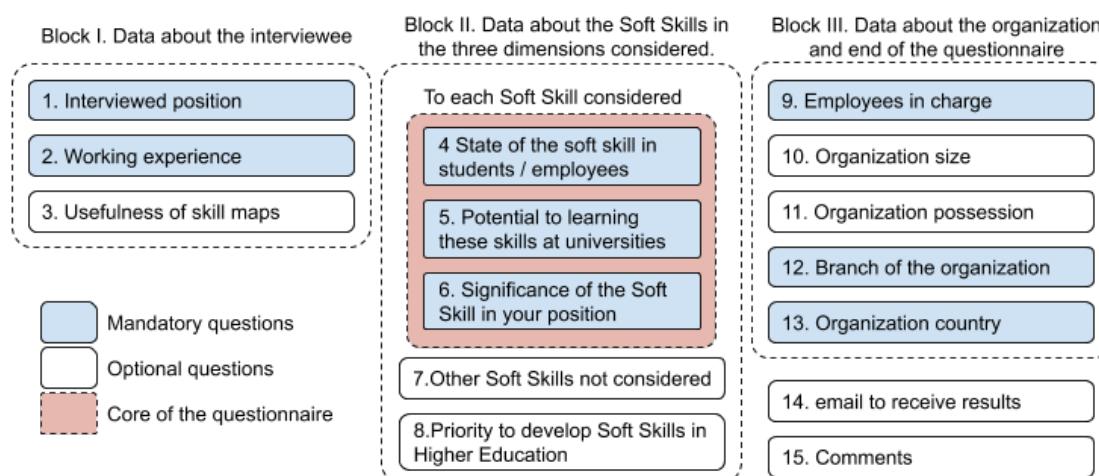


Figure 9. Questionnaire structure

In the main part (Block II in figure 7) of the questionnaire, the respondents were expected to rate a set of soft skills as considered from their job position. The skills-set used in the questionnaire was composed as a derivative from the skills maps analysis, presented in chapter 3.3. The skills-set consists of five clusters (Goal orientation, Self-Management, Communication, Team working and Analytic thinking), counting totally 21 skills ([annex ..](#)).

The respondents were asked to rate each of these 21 skills with respect to three dimensions (significance / development potential / status of skill). The first dimension is measured by questioning ‘*How significant do you consider this skill in your work position?*’ (1 = not significant at all, 5 = highly significant). This angle enables straskeducturing the skills according to their importance in respective business position. In



addition, it gives indication on soft skills that should be emphasized in higher education curricula and staff trainings (VAT) on the particular professional field.

The following dimension was operationalized as '*How possible do you consider developing this skill at a university?*' (1 = not possible at all, ...; 5 = highly possible) This dimension aims to give indication to both trust in higher education institutions and in the learning potential of each particular skill.

As for the third dimension, the question presented was '*According to your working experience, what is recently graduates' level of this skill?*' (1 = extremely low, 5=very high). This question seeks to highlight possible skills gaps, as well as differences in individuals regarding these levels.

The Soft Skills Status Indicator (3Si) method created during the project is based on this questionnaire and subsequent excel analytic. The method provides several indications related to the level and development potential of any skill. The results indicate the significance of an individual skill in a specific job position, the perceived skill level of graduated in respective skills, and additionally the perceived level of learning potential of respective skill. As a secondary outcome, the method indicates differences in the development potential of skills. Except for organizations, HR-bodies and VAT, the method is expected to be useful at universities and other educational bodies.

5.4 Questionnaire implementation

5.4.1 The problem to ask about skills maps

The questionnaire has been implemented in Google Forms, due to we used Google Drive as the project management system. A version in English has been developed to be used as a template to the partners. This version can be obtained in this address:

<https://forms.gle/FyErM7X4bcFwr5436>

The questions have been implemented as a classical format (short text, long text, one-option, and so on). But the core of the questionnaire is the three dimensions' valuation of the 21 skills. In this case, we use a matrix of the skill map and the valuation of each skill. Consequently, the result is that interviewee must answer the number SK of skills multiplied by the number of dimensions D.

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Please rate the significance of the following skills in your current position: *

| | Strongly disagree | Disagree | Neutral | Agree | Strongly agree |
|--|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Initiative: React to opportunities and challenge proactively, produce innovative ideas. Make decisions and take actions. | <input type="radio"/> |
| Goal orientation: Act with continuous improvement, set goals and standards and motivate self with goals | <input type="radio"/> |
| Planning & Organization: Prioritize and establish plans of action, optimize resources to reach expected results. | <input type="radio"/> |
| Preoccupation with order and quality: Caring for work conditions and results for self and other. | <input type="radio"/> |

Figure 10. Questionnaire: matrix of skills and values.

In the case of the project CoSki21, we decided to use 21 soft skills' map, consequently interviewee must respond 63 questions. This is the main challenge of the questionnaire. To future projects is important to have a friendly interface to obtain the dimensions-based skills map questionnaires.

Obviously, our selection of soft skills may not cover the important soft skills for 100%. Therefore, a question was raised about possible shortcomings.



Are there other core skills that should be included in the above list?

Tu respuesta

Figure 11. Questionnaire: the opinion about soft skills missed.

5.4.2 The influence of the interviewee

The other important aspect of the questionnaire is the personal opinion, and possible predisposition, of the interviewee about soft skills. There is a general agreement that soft skills are necessary and should be considered for success in companies. However, there are people, generally oriented to an organization of the twentieth century, not twenty-first, who may not agree.

To know the percentage of respondents who might disagree, a question was raised about the point of view of the interviewee. As this aspect is subjective, the question was posed at the beginning of the questionnaire.

Do you find competence maps or skills dictionary useful for your company?
(optional)

If you have no opinion on competence maps, please pass this question.

1 2 3 4 5

Strongly disagree

5. Strongly useful

Figure 12. Questionnaire: opinion about the soft skills maps.

The CoSki21 questionnaire includes also a pedagogical utility. The respondent, in order to answer the questions of the skill maps, will have read the definitions and, therefore, may have realized their need.

To check whether the interviewee maintains the opinion after conducting the survey core, a question of similar intention was included at the end of the survey.



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To what extent do you agree that developing these skills should be a greater priority in further and higher education?

| | | | | |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1 | 2 | 3 | 4 | 5 |
| <input type="radio"/> |
| Strongly disagree | | | | Strongly Agree |

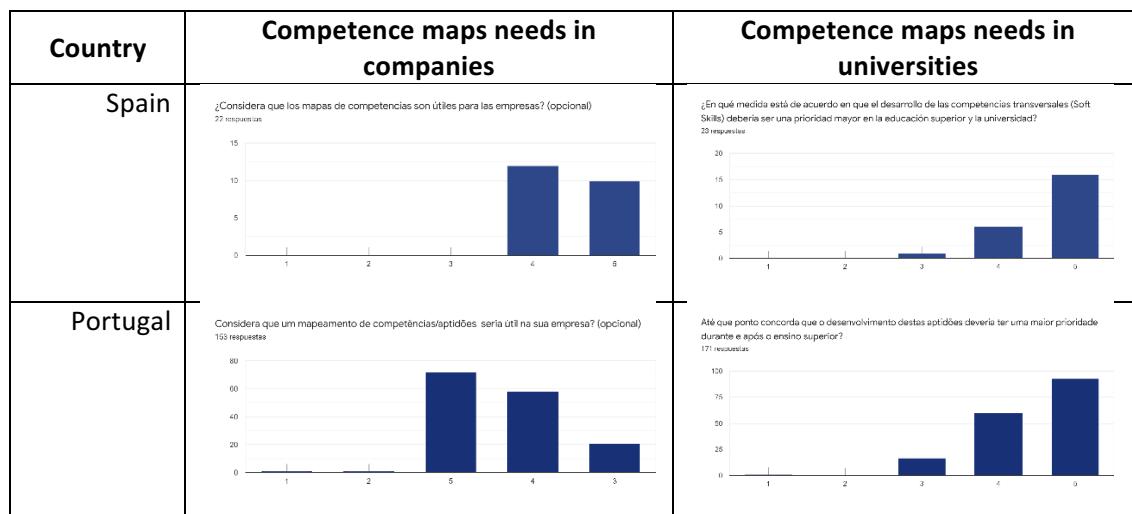
Figure 13. Questionnaire: opinion about the utility of soft skills.

5.5 Results

Only academic partners (universities: UPV, IPP, TUAS and HU) have done the survey. WIN and INTEGRA collaborated with the consolidation and validation of the data. Below are the results chosen from among all the questions and sorted by country. It is important to note that the total results are accessible on the European Union's results platform (E + ERP)

5.5.1 The importance of Soft skills

This section focuses on the questions about the importance of Soft Skills in companies and in organisations. The first of the questions refers to the importance of competence maps for the company surveyed. The second question refers to whether companies consider it necessary for competency maps to be more important in universities. The results for each country are presented in the next graphs.



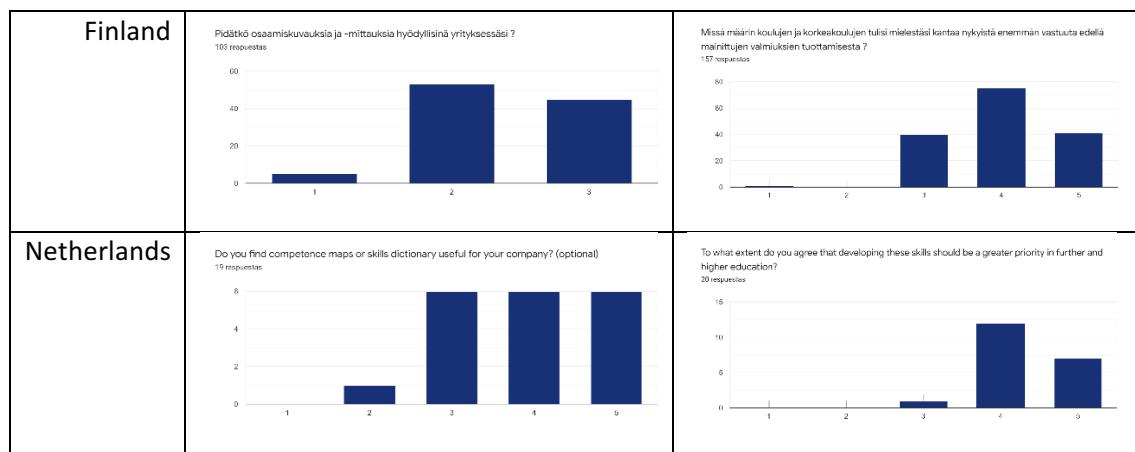


Table 7. Questionnaire results.

5.5.2 From Soft Skills to Core Skills

The sample of the research consists of business professionals working in different fields and positions in companies and public organizations, gathered in Turku region during May-June 2018. In order to have an extensive insight presented in the research, our aim was to include professionals on all levels of business fields and in various positions, counting with at least three years of working experience. The sample counted in total 159 respondents of which 13% worked in a manager position, 23% in expert position and 64% in operative positions of sales and other tasks related to business. They represented private (70%) and public (30%) organizations, out of which 3% small size, 19% medium size and 46% large size, covering in total 17 different branches.

The dimensions are labelled with the following abbreviations: 'Company' means the significance of respective skill, 'University' refers to the trust in learning potential of the skills, and 'Student' refers to graduates' level of respective skill.

As for the first dimension, the most significant skills (Company) were Communication (4,60), Team working skills (4,45), Customer orientation (4,43), Initiative (4,38) and Preoccupation with order and quality (4,35). The lowest rated were Leadership (3,55), Conceptual thinking (3,60), Networking (3,62)and People management (3,72). In terms of 'Significance' (Company), all skills were rated over 3,1.

Regarding the learning potential of skills (University), the scores were somewhat lower. As most potential skills were assessed Team working skills (4,18), Learning and use of knowledge (4,14), Planning and organization (4,10), Communication (3,96) and Analytical thinking (3,71). The lowest ratings were given to Empathy (2,84), Commitment to the organization (3,14), Customer orientation (3,18), Initiative (3,33) and Self-control (3,33).



In all, the lowest scores were given in the dimension considering graduates level of skills (State). In this dimension, the highest rated were Learning and use of knowledge (3,88), Team working (3,79), Communication (3,66), Customer orientation (3,63) and Flexibility and adaptation to change (3,59). The lowest rated in this dimension were Leadership (3,04), People management (3,08), Empathy (3,29), Creativity (3,36) and Self-control (3,36).

| Soft Skill | Company | HEI | Graduate |
|--------------------------------------|---------|------|----------|
| Analytical thinking | 3.79 | 3.71 | 3.38 |
| Commitment to the organization | 4.09 | 3.14 | 3.42 |
| Communication | 4.60 | 3.96 | 3.66 |
| Conceptual thinking | 3.60 | 3.64 | 3.40 |
| Creativity | 4.03 | 3.38 | 3.36 |
| Customer orientation | 4.43 | 3.18 | 3.63 |
| Empathy | 3.90 | 2.84 | 3.29 |
| Flexibility and change management | 4.31 | 3.47 | 3.59 |
| Goal orientation | 4.21 | 3.59 | 3.50 |
| Initiative | 4.38 | 3.33 | 3.45 |
| Leadership | 3.55 | 3.47 | 3.04 |
| Learning and use of knowledge | 4.30 | 4.14 | 3.88 |
| Negotiation | 4.04 | 3.58 | 3.47 |
| Networking | 3.62 | 3.70 | 3.55 |
| People management | 3.72 | 3.57 | 3.08 |
| Planning and organization | 4.23 | 4.10 | 3.48 |
| Preoccupation with order and quality | 4.35 | 3.77 | 3.47 |
| Self-confidence | 4.26 | 3.40 | 3.43 |
| Self-control | 4.16 | 3.33 | 3.36 |
| Strategic orientation | 3.77 | 3.35 | 3.39 |
| Team working skills | 4.45 | 4.18 | 3.79 |

Table 8. Questionnaire results: lists of skills values. Average assessments of each soft skill in each dimension analysed (Soft skills are presented in alphabetical order to facilitate their location)

In this sample, branch or company size did not show any remarkable correlation with the rating of skills in either of the dimensions. However, some correlation was detected between respondent's position and the significance of a skill. Managers seemed to rate certain skills (leadership, people management) clearly higher than other professional groups. In addition, aged persons tended to assess the potential of learning lower than younger groups. In order to confirm these interesting observations, a more comprehensive sample would be needed.



5.6 Discussion

The results of the surveys provide indications on several levels. The direct results allow conclusions regarding the soft skills status in a certain environment (organization, company). Skills with more significance can be detected, as well as skills that seem to have development potential and a special need for developing.

The survey and the questionnaire also serve for observing and identifying cultural differences. Obviously soft skills are culture related, and Finnish business working environments might emphasize slightly different skills profile than the Spanish or Portuguese ones.

On a secondary level the questionnaire offers indication on the development potential of each skill. Even if this valuation is based on opinion, it is important for the higher education institutions, as their challenge often lies in lack of knowledge of nuances needed in working life.

The questionnaire justifies the use of tools to manage skills in organizations, the definition of a concrete framework, the use of a “standardized” methodology integral (not only detect), and the need of people empower with their own skills. For this reason, is convenient review how companies and universities can manage the hard and soft skills of their employees or students.





6 Soft Skills Tools

Regarding Hard Skills, they have been included in curricula of educational institutions for decades, and thus subjects for learning and teaching. However, design curriculum that includes Soft Skills requires greater management support. The same happens in companies.

Questionnaires provide a method for detecting the needs of Soft Skills in any organization. Organizations need skills management tools. Therefore, it is considered interesting for the project to review the tools that organizations use, in order to have a support when designing a relevant taxonomy to be used in the framework.

In organizations, these systems are called Competency Management Systems (CMS) being part of an application scope that helps organizations to catalog, search, and manage employee skills. These systems are maintained as an isolated product that is mainly used by specialists in human resources and management, and lately they are growing continuously expanding and improving in functionalities and applications. The idea of skills management has been utilized for a long time to ensure that the skills of the people working in the organization are adapted to its business goals.

However, when investigating the skills management tools that are available, there is a clear predisposition to specific tools. These tools have certain limits when integrating between different management components of a company. Especially when in many cases the skills management capabilities are relegated to only one database that does not have a feedback or update of external data. This update is necessary to facilitate the management and continuous training of the employees of the organizations.

6.1 A review of tools for organizations

To facilitate the management of soft skills in organizations, tools are needed to organize competence maps. From the project proposal until the end of the corresponding intellectual output, there has been a real explosion of automatic tools. The following selection, from the point of view of the partners, provides a more general view of the current offer and covers the necessary functionalities in the 21st century environment.

6.1.1 Nasa CMS

NASA's CMS system¹⁶ is a web application that is integrated with the learning management system called SATERN. Although the system focuses on managing and enhancing the hard skills of users, the evaluation process of a competence has to ensure that the context and purpose coincide with that user's competencies.

¹⁶ Currently integrated in the aPpel knowledge services (<https://appel.nasa.gov/>)



The objective of the NASA system is to offer the training courses that are necessary to develop the capabilities of employees for a specific job. In addition, users can check which training courses are being carried out by their workmates in the same area of knowledge.

The screenshot shows a web-based application titled "NASA Competency Management System". The top navigation bar includes links for HOME, My Portfolio, Feedback, and Search. Below the navigation is a toolbar with Logoff System, HELP, Competencies, Skills, Experience, Training, Position History, PBMA KR, and Download Dictionary. The main content area displays a table with the following columns: Remove, Post?*1, Competency, show details, Tier Level *2, Find Others, and Learn More. A note below the table says "Click here to ADD competencies to your portfolio." At the bottom, there are two notes: one about the *1 note regarding primary competencies and another about the *2 note regarding tier levels, both with detailed explanations.

Figure 14. NASA Competency Management System

Because it is an internal use application in the NASA organization, it does not imply any additional cost for its employees. It has the information of metrics on the investment of time and money in developing each competence so that they are accessible to both professional communities and users in leading positions within the system.

6.1.2 IHDC CMS Online

CMS Online is a proprietary IHRDC tool, which provides competence management, evaluation and reporting functionality. It allows the evaluation of the competence to be carry out by the worker, by his supervisor, and also to be independently reviewed by a qualified evaluator. The company that offers it as a service also offers the possibility of integrating the tool with existing systems to make the data accessible according to corporate needs.



The screenshot shows a web-based application for competency unit assessment. At the top, there's a navigation bar with tabs: DASHBOARD, ASSESS, PLAN, LEARN, EVIDENCE, and REPORTS. The ASSESS tab is active. Below the navigation is a breadcrumb trail: Dashboard > My Assessment > Competency Unit Assessment. On the left, a sidebar titled 'Competency Units' lists categories like Maintenance Inspection, Condition Monitoring, Maintenance Planning, Maintenance Plans, and Maintenance Plan. The 'Condition Monitoring' category is selected. The main content area displays a competency role 'Maintenance Functional Core Cus' and an assessment status '2 of 3 CU's Assessed'. A large box contains a skill statement: 'Condition Monitoring - Static Equipment Know different condition monitoring techniques for static equipment, their principles, functions, use and advantages; use correct calibration and maintenance practices for effective monitoring of equipment.' Below this are several checkboxes for tasks related to condition monitoring. At the bottom of the main content area is a table titled 'COMMENTS & EVIDENCE (Level 1 - Awareness)' with columns for Modify, Title, Required, Attached On, Expires, and Attachment.

Figure 15. IHDC Valuation system

Like previous systems, it is complemented with learning functionality. It has the purpose of monitoring the knowledge of a competency and the knowledge that is necessary to complete the evaluated level. It also provides to the worker his career development, and superiors (managers) can identify the most suitable candidates for a certain job depending on their evaluations results.

Two agreements are available to use its software license: remotely or managed by the client. The client-managed license implies that the software would have to be installed on the client's servers, but that also means having to buy the full use licence of the software. The license for remote use with the servers that IHRDC has needs to be renewed annually as part of the service managed by the company.

6.1.3 Skills base

Skills Base¹⁷ is a web-based skill management software. Its main objective is to increase the competency capacity of the organization that uses it by making an evaluation of the same. It has a large number of options, but its operation is based mainly on the following 4 steps:

- Creation of the account: for the organization that wants to use the system.
- Add skills: on which you want to track and evaluate to know their level.
- Invitation: from the workers to validate the skills previously introduced.
- Observe results: in the form of graphics and skill matrices. It also recognizes clustering to group people with similar skills and the most valued skills.

¹⁷ <https://www.skills-base.com/> (accessed April 2018)



Skills-base shows skills as a table in which persons are valuated in a scale depending the achievement of the corresponding skills.

Accounting Skills

| | Average cost method | Bank reconciliation | Bookkeeping | Creative accounting | Equity method | General ledger | Imprint system | Lean accounting | Purchase ledger | Purchasing | Stock and flow | Tax accounting | Unified ledger |
|---------------------|---------------------|---------------------|-------------|---------------------|---------------|----------------|----------------|-----------------|-----------------|------------|----------------|----------------|----------------|
| Christina Rosenthal | 2.00 | 1.50 | 2.00 | 3.50 | 2.00 | 3.00 | 1.00 | 1.00 | 2.00 | 1.00 | 2.00 | 3.00 | 3.00 |
| Donald Woods | 2.50 | 2.00 | 2.00 | 2.50 | 3.00 | 3.00 | 3.00 | 2.00 | 1.50 | 1.50 | 1.00 | 3.50 | 3.00 |
| Dwight Hoyle | 2.50 | 1.50 | 3.50 | 2.50 | 3.00 | 4.00 | 3.00 | 3.50 | 2.00 | 1.00 | 2.50 | 4.00 | 3.50 |
| Erica Bowden | 2.50 | 2.00 | 4.00 | 4.00 | 3.50 | 5.00 | 4.00 | 3.50 | 3.00 | 2.00 | 3.00 | 3.50 | 3.50 |
| Gretchen Joseph | 2.50 | 1.50 | 3.00 | 3.50 | 3.50 | 4.00 | 3.50 | 3.00 | 2.00 | 2.00 | 3.50 | 3.00 | 3.00 |
| Hazel Raynor | 2.00 | 1.50 | 1.00 | 2.50 | 2.50 | 3.50 | 3.00 | 3.00 | 1.00 | 1.00 | 2.50 | 2.50 | 2.50 |
| Jean Griffin | 4.00 | 1.50 | 3.00 | 3.50 | 3.50 | 3.50 | 1.00 | 3.50 | 4.50 | 1.50 | 4.50 | 5.00 | 4.00 |
| John Supervisor | 2.00 | 1.00 | 3.00 | 3.00 | 3.00 | 5.00 | 4.00 | 4.00 | 3.00 | 1.00 | 4.00 | 5.00 | 4.00 |
| Karen Hamilton | 2.50 | 1.50 | 4.00 | 3.00 | 3.00 | 4.50 | 2.50 | 4.50 | 4.00 | 1.50 | 2.50 | 4.00 | 3.50 |
| Louis Mangum | 3.00 | 1.50 | 2.50 | 2.00 | 2.50 | 4.50 | 1.00 | 2.00 | 1.50 | 2.50 | 3.50 | 3.00 | 3.00 |
| Neal Lawrence | 2.50 | 1.50 | 3.00 | 3.00 | 4.00 | 4.50 | 3.00 | 3.50 | 2.50 | 1.50 | 3.00 | 2.00 | 3.00 |
| Stephanie Baker | 3.50 | 1.50 | 3.00 | 2.50 | 3.00 | 3.50 | 4.50 | 4.00 | 4.00 | 2.50 | 3.50 | 3.50 | 2.00 |
| Wesley Grant | 3.00 | 1.50 | 3.00 | 3.00 | 3.00 | 4.50 | 3.00 | 3.00 | 3.50 | 1.50 | 3.50 | 3.00 | 3.00 |

Figure 16. Skills-base analysis of corresponding people skills

The main utility of this tool is manage and show the skill map accomplishment by the organizations' employees. One of the future interesting functionality is to match these skills with company's needs.

6.1.4 Skills DB Pro

The main objective of Skills DB Pro is to try to align the skills of a company's employees with the objectives of the company. With the use of this tool, you will know both the skills necessary to work in the company and the skills that workers need to train. All this can be displayed with graphics and tables.



Figure 17. Skills DB Pro and the interesting interface showing graphically the skills' achievement for a company

Regarding the previous characteristics, the system allows HR manager or CEOs to perform tasks to try to improve skills. Everything is registered in the system by visualizing the progress of each employee. These last characteristics is a good starting point in order to do complexes forecasts of the skills needs in a company.

6.1.5 Avilar

Avilar¹⁸ is presented as a leader in web-based competency management as a result of the large number of clients that they own. The use of this platform allows you to start a performance analysis plan evaluating the skills of the company's template that uses it. This plan is made up of the following steps:

- Identify gaps in competencies.
- Optimize the workforce.
- Comply with regulatory requirements.
- Align training with corporate goals.
- Make an inventory of capabilities.
- Employee evaluation and performance evaluation.

In the same way as the previous systems, it also presents a differentiation of roles and allows to test the system before paying for its use.

6.2 From the CMS towards the common framework

The revision of the CMS serves to determine which characteristics are those that allow to define the work environment of the soft skills. Specifically, it is possible to determine how these soft skills are characterized. This characterization will allow to know what aspects should be considered when choosing a map of soft skills for a company, and especially a set of core skills.

¹⁸ <http://www.avilar.com/> (Accessed April 2018)



The previous tools define the most common functionalities. These functionalities allow to determine which aspects are those that should be considered, in this case, to allow these aspects to be used, entities have been considered. These entities are described in chapter 7.1.

After the review of the entities, it is necessary to study the connections between them. These connections can allow us to design new CMS by researching the needs of the stakeholders involved in defining new curricula in universities, and so on. Next section provides the relation between entities.





7 Common framework of Soft Skills

7.1 Entities

The revised CMS allow us to determine which elements of the environment influence the selection of soft skills. They are presented briefly below. These elements are the result of the analysis of the previous CMS, and ratified in the interviews conducted by the members of the partners.

7.1.1 Skills related

The first important contribution is the fact that the same soft skill can have different “trade names”. Some soft skills do not have synonymous titles, for example *leadership* or *team working*. In general, there is a common point of view about the meaning of these soft skills.

- Soft Skill.
- Soft Skill cluster.
- Family cluster.

It should be noted that this framework does not consider the subtypes of soft skills, although it is prepared to be used. The sub-assemblies of soft skills are somewhat similar to the last name. For example, in the case of *leadership*, nuances are not currently included, it is considered that a leader can coordinate projects, lead teams and make valuable decisions.

However, the type (or style) of leadership can determine success in the company. If we consider Goleman's styles, a commander leader can be very useful in military environments or in the high reliability organization (HRO), but a coach leader can be useful in academic environments or human care organizations.

This aspect is of special importance, since the possible matching between skills that a person can offer and the skills that an organization may need, is refined through this soft skill surname. All organizations have leadership needs.

7.1.2 Organizations related

The elements related to organizations are those that provide the validation of core skills. These elements are as follows

- Type of company: structural aspects such as the field in which it works (local, international) or its size.
- Company branch: area, or areas, to which the organization is dedicated.
- Jobs: profile of the job, or jobs, that the organization requires to perform its functions.
- Tasks: Tasks to be performed by employees of organizations.





The novelty that the project brings to the elements that, traditionally, are considered important for companies, are the values of the same. The stock map is one of the elements that are currently considered relevant. A simple example is in the case of teaching. A school needs math teachers, these teachers can use a teaching style based on teamwork (more creative, freer) or based on personal work (based on the culture of effort or self-improvement). Both styles may be valid. Teachers who feel more comfortable in the first style should go to a school with values of teamwork, and teachers who feel more comfortable in the second style should go to schools with more traditional values. This is the reason why values have been considered one of the elements to consider.

7.1.3 Academic environment related

The elements related to the academic environment are those that will provide us with the formula with which to improve soft skills and reach the final objective of empowerment based on the evaluated soft skills. The elements that make up this part of the framework are:

- Teaching method: method with which both hard and soft skills should be transmitted.
- Learning style, or learning method: method with which the person acquires skills.
- Evaluation method: method with which both hard and soft skills will be evaluated

From these three elements and, as will be seen in the following subsection, people can acquire soft skills adapted to the styles of teachers, students and in line with the characteristics of organizations.

Finally, the empowerment method, for example, portfolio or video curriculum may demonstrate some soft skills or others.

7.2 Relations between entities: the role of the affinity

The key part of the project framework is not just the entities. The relationships between them will determine the ability to use the framework as an active element.

In the case of the project, after many deliberations and consultations with experts, something extraordinary happened. Each stakeholder agreed that the affinities between elements were not dichotomous (yes or no, approved or suspended) but should have some degrees. These degrees appear as the "level of affinity" of the figure.

The affinity level determines how one element is similar to another. For example, to teach teamwork, a teaching methodology based on teams is more appropriate than a methodology based on individual work. The affinity of the soft skill relationship "teamwork" with the teaching methodology "group work" will be 5 out of 5, the affinity of the relationship of soft skill "teamwork" with the teaching methodology "theoretical class" It will be 1 out of 5.

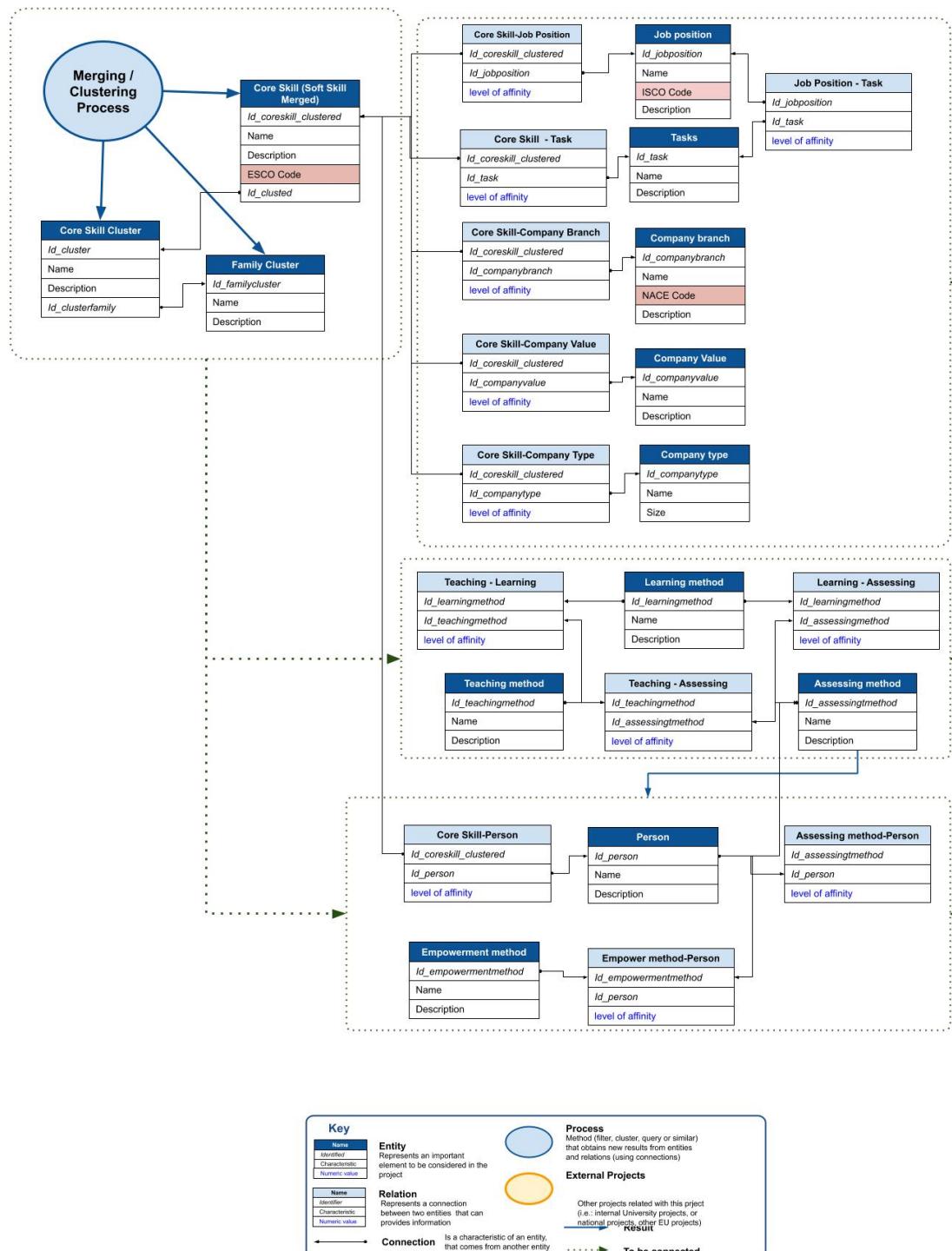


Figure 18. Coski21 Framework



7.3 Using the framework

The usefulness of the framework is multiple. Some essential issues can be highlighted in which this model can be used to design a framework:

- Support the database: the entity-relationship diagram used is the basis for database design. It is very simple to make a database based on this framework.
- Teaching support: the ability to decide which methods are most appropriate for which soft skills are specific.
- Support for the selection of personnel: by being able to make a match between the provided soft skills and the required soft skills, and that these competences are related to values, an appropriate assignment of people to organizations, projects or even tasks can be made. This assignment will not only depend on hard skills, as until now, but also on soft skills.
- Continuous staff training: knowing how soft skills evolve will allow employees to adapt their training, adapting to the changes required by the socioeconomic environment.

Future projects can use this framework to develop the methods to teach and assess soft skills, and to select the most appropriate people to the interest of the organisations.





8 Conclusions

Nowadays, soft skills are becoming more and more important. To find candidates for a job position with good hard skills is easier than ever. The real challenge is to find candidates that also have good soft skills. For this reason, soft skills should be better called core skills, since they are the ones that make the difference.

In this Intellectual Output, we have considered some important aspects to clarify concerning core skills. The first one is to structure, harmonize, and clarify characteristics used when discussing personal competences and soft skills. To cope with it, we have reviewed existing skills maps and competence management systems. An extensive analysis has been carried out, which in last term let us propose a new taxonomy for soft skills.

The second one is to detect the special need of soft skills in business and entrepreneurship. On the one hand, we intend to define a process in which we can propose what are the most relevant skills for a given company, and how this information should feed forward the curriculum of HEI. To extract this information, we have designed and tested a questionnaire. Some preliminary results are shown.

Besides, since entrepreneurship is becoming more and more relevant, we have tried to put some light into the most relevant soft skills that they need. All these results are also compiled into a common framework that will permit us to develop a standardized method matching skills needs and offers, see Figure XXX.

Finally, we have revised several Competency Management Systems (CMS) that can help business and organizations to organize the competence maps.