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ACTION GROUP 3

PROVINCIA AUTONOMA DI TRENTO

FONDAZIONE FRANCO DEMARCHI
IL SOCIALE COMPETENTE

IRES

Tools and guidelines for identification and assessment of a set of softs skills related to work-based learning and to the development of alpine economy

First framework based on desk and good practices analysis

Edited by I.R.E.S. Istituto di Ricerche Economiche e Sociali del Friuli Venezia Giulia Impresa Sociale

This activity is realized in the framework of the Alp Gov 2 project (n. 942) co financed by the ERDF fund through the Interreg Alpine Space Programme

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Abstract

This report illustrates the contents of a survey carried out, in the frame of *AlpGov* Interreg Alpine Space project, by I.R.E.S. Istituto di Ricerche Economiche e Sociali del Friuli Venezia Giulia Impresa Sociale, on behalf of and in collaboration with Franco Demarchi Foundation of Trento, aimed at developing a common framework and tools for the observation and evaluation of a set of soft skills considered most significant in a context of work-based learning and in a development perspective of the Alpine economy. In particular, the work is framed within the Work-plan 2020-22 of Action Group no. 3 *Labour market, education and training* of EUSALP - EU STRATEGY FOR THE ALPINE REGION.

One of the first difficulties one encounters when working on soft skills is that, although their importance in learning processes and in the labour market is increasingly recognised, the concept of soft skills still appears poorly defined in the scientific literature, so much so that there are various names, basically synonyms, to indicate this complex of competences. Even the classification and exact naming/definition of the various soft skills have not yet led to a consolidated and commonly recognised result. For this reason, after examining the various existing classifications, it was decided to identify the ESCO 1.1 classification - European Skills, Competencies and Occupations Taxonomy, which is the most recent multilingual classification of European Skills, Competencies, Qualifications and Occupations - and in particular in the sub-pillar Transversal skills (ESCO-t) - as the most suitable general reference framework for defining and naming the various soft skills. This is because:

- it is a multilingual database, considered that it is translated into 27 languages;
- it has a strong European value, as it's an EU DG Employment, Social Affairs and Inclusion initiative;

- it is a wide, complete and "open" collection of soft skills that's constantly revised and updated, ensuring that its contents are always in line with the needs of the European labour market, including emerging ones (e.g., the so-called green skills).

ESCO-t currently includes 24 soft skills, which is far too high a number to be adequately analysed in its entirety within the framework of this work. Therefore, a more limited number of soft skills were selected, the development of which should be prioritised considering the specific contexts of work-based learning (WBL), the transnational mobility of learners and the characteristics of the Alpine economy, which represent three points of focus for the EUSALP AG 3 action. This was achieved through an extensive analysis of the existing bibliography on the relationship between soft skills and these three themes, which led to the identification of seven soft skills present in ESCO-t which should be considered as priorities (although obviously not exclusive) in the learning processes related to the three identified contexts:

- T4.3 **Collaborating in teams and networks**, reported as important in all three areas;
- T4.1 **Communicating**, highlighted in two out of three areas;
- T3.2 **Taking a proactive approach**, also emerged in two out of three areas;
- T1.3 **Working with digital devices and applications**, taking into account the increasing pervasion of information technology in every profession, at any level, which requires the development of appropriate basic digital skills in all young people entering the labour market;
- T2.4 **Thinking creatively and innovatively** (including futures literacy), considering the continuous and profound processes of change taking place in all economic sectors and occupational profiles of the Alpine economy, which increasingly require the ability to foresee future scenarios and to face the challenges they pose, developing innovative and creative solutions. The inclusion of futures literacy among the narrower skills of T2.4 constitutes a proposal for modification and integration of the ESCO-t Framework;
- T3.3 **Maintaining a positive attitude**, choice given the transversal importance for many professional profiles of knowing how to manage stress, uncertainty, frustration, especially in conditions of great instability (think of the recent experiences related to the Covid-19 pandemic or the energy shock following the war in Ukraine) and to develop rather a positive attitude towards work;

- T6.2 **Applying environmental skills and competences**, in light of the growing importance of the sustainable development model in all sectors of the Alpine economy, which requires the presence of a basic 'green' culture among all workers. For this skill it is proposed to change the current name of T6.2 ESCO in Applying core skills and competencies for the green transition, a concept broader and more comprehensive than just the environmental component, that addresses the issue of overall sustainability.

The assessment of soft skills requires a wide range of procedures to measure and, considering the WBL, regards two different contexts: the learning and the working environment. We must also consider that assessment strategies and tools can differ on varying of different soft skills, or of different intended learning outcomes of teaching activities. According to literature, it is important to think in terms of a new soft skills paradigm:

- soft skills can be considered integrated with hard skills and can be taught and assessed together with them;
- the context plays an important role for soft skills and can't be separated from it;
- soft skills involve several actors: teachers/trainers, classmates, tutors, employers.... a true dialogue between them is needed;
- a precise measurement for soft skills is often impossible;
- to effective soft skills teaching we need to update didactics and teaching and learning methodologies.

The survey has identified a multitude of assessment strategies: some of them have been in practice for a long time, others are more recent. Their suitability will depend on the coherence between what is to be evaluated and how it is evaluated. The following methodologies were investigated in detail, identifying their advantages, disadvantages and actors involved: self-assessment; portfolio; multiple choice scenario; interview, storytelling and presentation; observation; peer assessment; questionnaire; assignment-project; case study.

Starting from the seven identified ESCO-t soft skills, we proceeded to compare and integrate them with the four European frameworks related to soft skills, existing to date: *DigComp* for digital competences, *EntreComp* for entrepreneurial competences, *LifeComp* for personal, social and learning to learn skills, *GreenComp* for competences related to sustainability and green transition. Although there was a significant lack of homogeneity in the approach of the four European fra-

meworks, it was possible to identify possible indicators, evaluation methodologies and, where present, also proficiency levels and certification devices capable of favouring the evaluation of the seven soft skills considered. As far as regards certification, systems recognised at European level have been identified only in the digital field (within the ICDL - International Certification of Digital Literacy - certification system), making it possible to align, at least partially, with *DigComp*; for the other soft skills and frameworks, a European framework for certification is still substantially to be constructed and represents a priority for the coming years, together with the organic revision and integration of the various existing tools at European level such as the four frameworks and ESCO-t. Based on the results of the desk analysis, it was possible to construct an "ideal" intervention profile in the area of soft skills development and assessment: this good practice model outlines a complex and articulated intervention, made up of various actions integrated with each other that include the entire cycle of analysis, design, implementation and evaluation of training activities relating to the development and evaluation of a set composed of several soft skills, possibly carried out with the contribution of public institutional subjects that can enhance the experience carried out, on a transnational scale, with extensive use of digital technologies and interactive methodologies, capable of being easily suitable for the contexts of work-based learning or mountain economy: a profile that is certainly not easy to find in the field, given also the specific nature of the issues addressed.

This profiling effort made it possible to construct a questionnaire for the detection of good practices in this field using a CAWI (Computer Assisted Web Interviewing) technique. The survey was carried out in May 2022, involving the 48 Regions/Provinces of the EUSALP area, the members of EUSALP Action Group 3, as well as a selected number of actors from outside the EUSALP area. Seven good practices were surveyed: five Italian, one Austrian and one Portuguese (but related to an Erasmus+ project involving a transnational partnership). The good practices surveyed generally present a simpler profile than the theoretical, ideal model: for example, they are experiences that focused only on certain phases of the work cycle or considered only one or a few of the identified strategic soft skills, or used a limited set of training/assessment methodologies and technologies. In some cases, we are faced with more structured and complex interventions that offer various insights for improving the effectiveness of future actions.

On the basis of all the elements of reflection collected during the survey, 11 recommendations were finally defined that can facilitate the achievement of the result of a greater presence and awareness of the role of soft skills in the learning processes in the VET and WBL area, and their translation into an operational key. In order to achieve this objective, the collaboration of all VET system actors is necessary. In particular, three types of actors have been identified to whom these recommendations are differentially addressed: public bodies responsible for

VET policies at different levels; private or public bodies responsible for delivery of training activities in the VET area (VET providers), companies and employers' associations involved in particular in work-based learning activities:

1 **Explaining and making transparent the importance of soft skills in learning processes.** The bibliographical analysis confirmed that soft skills are often considered to be less important than technical-professional competences in learning processes, whereas in the labour market they have become increasingly important with the tumultuous advent of new transformation and innovation processes; it therefore seems necessary to realign training policies with the professional needs of companies. The first recommendation concerns the need to bring to the surface and make evident and clear the contribution that soft skills can make to learning processes. This involves working through all phases of the VET cycle: from regulatory aspects, to training design, content development and delivery, and evaluation.

2 **Using a common framework for the definition and classification of soft skills.** One of the main problems encountered during the survey is the lack of a common reference framework for the definition and classification of soft skills, which often makes the results of projects and analyses from different sources difficult to compare. Among the frameworks analysed, the use of the ESCO classification - European Skills, Competences, Qualifications and Occupations, area T - Transversal skills and competences (ESCO-t) is proposed, even if with some proposals for modification/integration. Certainly, much remains to be done: the publication, in recent years, of four European frameworks relating to the field of soft skills (*DigComp*, *LifeComp*, *EntreComp*, *GreenComp*), makes it necessary to make an effort to homogenise and align ESCO-t and the four frameworks (as partially attempted in this work), in order to enhance the effectiveness and usability of these tools.

3 **Identifying soft skills in addition to the basic cluster, which are important for an economic sector and/or a job profile.** The present work allowed to identify a limited cluster of seven soft skills considered to be the most significant to support learning processes in WBL, transnational training mobility, and to promote the development of the Alpine economy. However, each economic sector and/or professional profile presents specificities to be taken into account in the definition of the learning pathways: if the seven identified soft skills can be considered a common basis, it appears necessary to define broader soft skills profiles for each professional figure or sector considered, adding to the training objectives other soft skills, again using ESCO-t, identified taking into account the specific needs of the economic or professional sector considered.

4 **Training of teachers, trainers and tutors/supervisors.** Training programmes for teachers in VET programmes should reflect the fact that employees in today's workplaces need not just occupation-specific and technical skills but also stronger basic, digital and soft skills. VET teachers need to facilitate the development of these skills among their students but not all of them know how to effectively teach such skills in a VET setting. Besides technical knowledge, they need to have pedagogical knowledge too, but often have limited pedagogical preparation. On the other hand, it is well known that the company tutors/supervisors assume a fundamental role in the development of work-based learning in companies and organizations, and must have appropriate technical-professional, pedagogical and social skills, including the ability to transfer and develop soft skills needed in each specific economic sector or job. In essence, there is a need to align soft skills between VET providers and enterprises, promoting VET teachers' and tutors' ability in guiding students in the process of activation of key soft skills during their work-based learning experience.

5 **Pre-WBL/apprenticeship and pre-mobility programmes.** The fifth recommendation is within the framework of an integrated model of learning activities to be carried out before, during and after WBL experiences (apprenticeship but not only) and/or training mobility. Different types of pre-WBL/apprenticeship programmes have been developed recently, with the aim to provide young people with the necessary preparation that will facilitate their access to a regular apprenticeship/WBL programme. Pre-apprenticeship - but also pre-WBL and pre-mobility programmes - are particularly suited to the development of basic, soft and employability skills, giving the opportunity to undertake an initial assessment of young people's skills and providing them with opportunities to develop lacking skills using a wide range of innovative and engaging training methods.

6 **Soft skills development methodologies.** Soft skills and different learning contexts need different teaching strategies or, preferably, the integration of multiple strategies; it is necessary to consider ways to take an integrative approach to developing soft skills, which incorporates elements of soft skills into wider learning, instead of creating modules that are specific to soft skills. Learning soft skills is important, but only part of the learning equation: trainees (and employees too) must be able to apply those skills within the context of their job. The process of constant reinforcement through quick reference, microlearning in the flow of work turns soft skills into real capabilities that help trainees and employees perform at their highest level.

7 **After-WBL/apprenticeship and after-mobility activities.** The examined literature has shown that the activities which take place after the conclusion of the WBL and training mobility experiences are one of the weakest and least considered aspects of the whole cycle of activities, even though they play a non-se-

condary role in guaranteeing the effectiveness and overall training success of these experiences. The objective is to consolidate the results of the learning processes, fostering a reflection on the experiences realised, allowing the evaluation of the learning pathway and of the WBL/mobility programmes, favouring the definition of objectives for further professional development and/or insertion in the labour market.

8 **Methodologies for soft skills assessment.** The Assessment of soft skills can be a critical factor, as it requires the use of unconventional and non-standardised methodologies, in which the qualitative dimension prevails over the quantitative one. The adoption of Castoldi's trifocal skills assessment model - which provides for the integration of three different points of view: the subjective one of the learner, the objective one of the trainer, the intersubjective one of the companies - can provide a useful methodological framework. Self-assessment is a good learning opportunity because it not only focuses trainees on the content being assessed, but also on the process of self-evaluation, which is, in itself, a critical soft skill. Debrief of assessment by employer and/or trainer can provide an additional opportunity: learners will be evaluated by teachers/trainers and employers, based on a rubric or other assessment tools. Having the students take time to understand and integrate the teachers' and employers' perceptions of their performance is a rich learning experience. Portfolio - a collection of work that a learner has collected, selected, organized, reflected upon, and presented to show understanding and growth over time - can be a useful and powerful tool for summatory assessment, used to document the attainment of WBL/mobility learning objectives and can be scored with a holistic rubric.

9 **Recognition, validation and certification of soft skills.** The issue of recognition, validation and certification of soft skills, especially those developed in non-formal and informal fields, is becoming a current topic for all educative and training institutions, even if it is still largely an open issue, mainly due to the lack of a widely recognised classification and definition framework and to the difficulty of operationalizing soft skills, declining indicators to recognize different levels of expertise, identifying tested tasks useful to assess the different soft skill levels. The four European soft skills frameworks, when combined with the ESCO-T classification, can offer a starting point on which to build a broader European certification framework. The reference model can be that of basic digital competences: the European *DigComp* framework finds in fact at least a partial reference in the certification system developed by ICDL, so some of the ICDL certifications can be related to the *DigComp* skills, even if the framework does not yet appear complete and perfectly aligned. A further research effort seems necessary at this point in time to extend this model to other soft skills and to progressively build a genuine European soft skills certification system that can promote the recognition of the importance of soft skills in learning processes and in the labour market.

10 **Valorisation of the role of digital learning and emerging technologies in the development of soft skills.** Digital learning and emerging technologies are offering new tools to teach soft skills in powerful ways; gamification, virtual and augmented reality, and simulations are just a few, increasingly closely connected. Organizations and VET providers can use gamification and game-based learning to give learners a time constraint and approach a situation by thinking on their feet. Augmented Reality (AR) and Virtual Reality (VR) are immersive technologies that help students explore all sorts of content in a more lifelike way, connect learning to real-world situations, and achieve what's generally impossible in classrooms. Scenario-based learning, also called branching simulation or branching scenarios, is another method strictly related to Virtual Reality. Lastly, Digital badges have recently emerged as an engaging technique for tracking and recognizing learner progress in the development of specific non‑academic skills. The further development of these technologies and methodologies and their dissemination throughout the VET system obviously requires the investment of considerable resources, which are beyond the reach of a single actor. Therefore, a system action, possibly on a transnational scale, seems necessary in order to provide VET systems with the tools to test these new opportunities on a large scale.

11 **Promoting the dissemination of emerging soft skills.** The last recommendation concerns the need to promote the diffusion of certain emerging soft skills, on which the interest of the academic and business worlds is focusing, due to their importance in connection with the great challenges of the 21st century, in particular the core skills for the green transition and futures literacy. The transition to environmental sustainability (the so called "green transition") continues to affect existing occupations, where reskilling or upskilling is needed, and requests also more soft, core skills, reflecting the fact that there may be green alternatives for all kinds of processes, products and services. Futures literacy enables persons to become aware of the sources of our hopes and fears, and improves their ability to harness the power of images of the future, to enable them to more fully appreciate the diversity of both the world around us and the choices they make. These two skills were chosen because they are paradigmatic of the fact that the soft skills system also evolves continuously and must therefore be constantly reviewed and updated. It is obviously necessary to build learning pathways for these skills, to be included within the VET system, also taking into account the context of work-based learning that requires considering not only a classroom learning setting but also an on-the-job learning setting.

1.0 Objectives and contents of the survey

This report illustrates the contents of a survey carried out by I.R.E.S. Istituto di Ricerche Economiche e Sociali del Friuli Venezia Giulia Impresa Sociale (from now on IRES FVG), on behalf of and with the collaboration of Fondazione Franco Demarchi of Trento, aimed at developing a common framework and tools for the observation and assessment of sets of soft skills considered most significant in a context of work-based learning and in a development perspective of the Alpine economy.

In particular, the work is framed within the framework of the Work-plan 2020-22 of Action Group no. 3 *Labour market, education and training*; of EUSALP, giving rise to the Action "Soft skills assessment method tool for WBL in Alpine Space" envisaged therein. EUSALP - EU STRATEGY FOR THE ALPINE REGION is a macro-regional strategy, endorsed by the European Council, with the aim to provide an opportunity to improve cross-border cooperation in the Alpine States as well as identifying common goals and implementing them more effectively through transnational collaboration. EUSALP concerns 7 Countries, of which 5 EU Member States (Austria, France, Germany, Italy and Slovenia) and 2 non-EU countries (Liechtenstein and Switzerland), and 48 Regions/Provinces.

Action Group 3 Labour market, education and training aims at improving the adequacy of labour market, education and training with employment opportunities in strategic sectors in the Region, and at increasing the employment levels of the Region through joint macro-regional activities. The importance of soft skills in the world of work and in learning processes is by now universally recognised, even though much remains to be done to arrive at a homogeneous and shared reference framework for this category of competences, both with regard to their classification and denomination, and with regard to the methods of observation, evaluation and certification. The general objective of the work is to elaborate a common reference framework on the tools and methodologies available for the observation, evaluation and validation of the most significant soft skills in a

context of work-based learning and for the governance of the transformation and development processes of the Alpine economy. In particular, we aim to:

- Identify a common framework for the naming and classification of soft skills, which can constitute a common reference for all actors of the EUSALP training and education systems; the results of this work are presented in chapter 2;

- to select, on the basis of a desk-analysis, the most significant soft skills for the work-based learning contexts and for the governance of the main transformation processes affecting the Alpine area, also taking into account the condition of transnational collaboration which characterises EUSALP; the results of this work are presented in chapter 3;

- to verify, again by means of a desk-analysis, the existence of observation, evaluation and validation systems for these soft skills, in order to build a matrix of available tools and methodologies (see chapter 4);

- collect and analyse good practices and success stories in the Alpine macro-region regarding the learning and validation of the identified soft skills (cf. chapter 5);

- to elaborate guidelines for the development and observation, evaluation and validation of the soft skills considered in the Alpine regional systems (chapter 6).

2.0 A general framework for soft skills

2.1 Definition and classification of soft skills

Although their importance in learning processes is increasingly recognised, the concept of soft skills still appears poorly defined in the scientific literature, so much so that there are various names, essentially synonymous, to indicate this set of competences. Even the classification and exact naming/definition of the various soft skills have not yet led to a consolidated and unanimously recognised result.

The theme of soft skills, their definition, validation and possible certification is a strategic issue to be addressed in order to confer greater quality to the learning processes in the formal and non-formal spheres and to foster the process of integration between training systems in the logic of long life learning, work-based learning and in a perspective of transnational cooperation in which EUSALP is placed.

A large variety of names are often used as synonymous of soft skills, such as: Generic Skills, Essential Skills, Skills for Life or Basic Skills, People Skills, Key Skills/Competences, Employability Skills, Core Skills, Transversal Skills. It is not the purpose of this work to analyse in detail the differences, which are sometimes blurred and not always clearly definable, between these different designations: for the sake of brevity and convenience, the name soft skills will be used from now on. This is the

most commonly used, even if the reference sources use other synonyms.

Soft skills are a set of **non-technical skills and knowledge** that underpin **successful participation in work**. They are non-job specific (thus they are also called transversal skills) and closely connected with **personal attributes** and **attitudes** (confidence, discipline, self-management...), **social** (communication, team working, emotional intelligence…) and **management and methodological abilities** (time keeping, problem solving, critical thinking…). Due to a certain level of intangibility, some of them are rather difficult to be quantified and developed.

This amounts to a total of over 30 identified soft-skills: a rather broad field therefore, which necessarily requires a choice in order to narrow the analysis down to a more limited but significant number of soft-skills.

In the present report we don't refer to soft skills as a synonymous of **"key competences"** even if there are many common elements between these terms (key competencies can be considered part of soft skills but they don't include all them). The name of "key competences" was firstly used by the European Parliament and Council in their December 2006 Recommendation to the Commission, revised in May 2018 (Council Recommendation on key competences for lifelong learning). The final document issued by the Commission, the European Framework for Key Competencies for Lifelong Learning, gathers 8 key competences, which are a mix of soft skills and basic skills such as numeracy and literacy.

Key competences are those which all individuals need for personal fulfilment and development, employability, social inclusion, sustainable lifestyle, successful life in peaceful societies, health-conscious life management and active citizenship. They are developed in a lifelong learning perspective, from early childhood throughout adult life, and through formal, non-formal and informal learning in all contexts, including family, school, workplace, neighbourhood and other communities.

The key competences are all considered equally important; each of them contributes to a successful life in society. Competences can be applied in many different contexts and in a variety of

combinations. They overlap and interlock; aspects essential to one domain will support competence in another. Skills such as critical thinking, problem solving, teamwork, communication and negotiation skills, analytical skills, creativity, and intercultural skills are embedded throughout the key competences. The Reference Framework sets out eight key competences:

1. **Literacy competence**;
2. **Multilingual competence**;
3. **Mathematical competence and competence in science, technology and engineering**;
4. **Digital competence**;
5. **Personal, social and learning to learn competence**;
6. **Citizenship competence**;
7. **Entrepreneurship competence**;
8. **Cultural awareness and expression competence**.

Since 2013 several reference frameworks for specific key competencies and soft skills have been developed by the European Commission, all aimed at providing a common ground to learners and guidance to educators and to assess progress in supporting education and training:

- DigComp - Digital Competence Framework for Citizens – 2013, now at 2.2 edition;
- EntreComp - Entrepreneurship Competence Framework – 2016;
- LifeComp –European Framework for Personal, Social and Learning to Learn Key Competences – 2020;
- GreenComp – European sustainability competence framework – 2022.

These frameworks are an important resource for a clear definition, framing, classification, and also for the assessment of the soft skills included: they will be resumed and in-depth considered further in the report (see further this chapter and chapter 4).

Another important resource coming from European Commission is **ESCO - European Skills, Competencies and Occupations Taxonomy**, which is the most recent multilingual classification of European Skills, Competences, Qualifications and Occupations. The aim of ESCO is to support job mobility across Europe and therefore a more integrated and efficient labour market, by offering a "common language" (it is available in 27 different languages) on occupations and skills that can be used by different stakeholders on employment and education and training topics. ESCO is a European Commission project, run by Directorate General Employment, Social Affairs and Inclusion (DG EMPL). It is available in an online portal and can be consulted free of charge. Its first full version (ESCO v1) was published on the 28th of July 2017; the latest version is ESCO 1.1, published in January 2022.

The ESCO classification identifies and categorises skills and competences, qualifications and occupations (the so-called three pillars) relevant for the EU labour market and education and training. It systematically shows the relationships between the different concepts and it is constantly updated.

The SKILLS pillar of ESCO contains about 13.500 concepts, structured in a hierarchy which contains four sub-classifications. Each sub-classification targets different types of knowledge and skill/competence concepts:

- **Knowledge;**
- **Skills;**
- **Transversal skills;**
- **Language skills and knowledge.**

Other 2 pillars cover 2.942 occupations and 2.414 qualifications. As regards qualifications, ESCO is linked to ISCO (International Standard Classification of Occupations) and to EQF (European Qualification Framework).

The most interesting section for the aims of this work is the "transversal skills" sub-pillar. It can be considered the most updated reference framework at European level for the definition and classification of soft skills and **for this reason it will be used in this work and it's recommended to be used at EUSALP level when considering soft skills.** In fact:

- it is a multilingual database, as it is translated into 27 languages (all official EU languages plus Icelandic, Norwegian and Arabic); in this way, it is a useful common ground and resource for transnational cooperation projects, when it's needed to identify or to define specific soft skills as outputs of specific learning paths, or to design training activities;

- it has a strong european value, as it is a EU DG Employment, Social Affairs and Inclusion initiative, that is managing the development and updating of the ESCO classification. To this end, it is supported by external stakeholders and the European Centre for the Development of Vocational Training (Cedefop);

- it is a wide, complete collection of soft skills and it is constantly revised and updated, ensuring that its contents are always in line with the needs of the European labour market, including emerging ones. For example, the recent 1.1 version included the following changes: new occupations and skills and knowledge concepts; corrections in the descriptions and labels in various languages; an updated hierarchy for transversal skills; a list of green skills and skills for researchers.

Considering its importance, the following chapter will offer a wider and deeper explanation of ESCO *transversal skills* sub-pillar.

ESCO transversal skills sub-pillar

2.2

ESCO uses transversal skills as a synonym for soft skills. For ESCO, transversal knowledge, skills and competences are relevant to a broad range of occupations and economic sectors. They are often referred to as core skills, basic skills or soft skills, the cornerstone for the personal development of a person. Transversal knowledge, skills and competences are the building blocks for the development of the 'hard' skills and competences required to succeed on the labour market.

Within the skills pillar, transversal knowledge, skills and competences are organised in a hierarchical structure with the following five headings:

- **Thinking;**
- **Language;**
- **Application of knowledge;**
- **Social interaction;**
- **Attitudes and values.**

Transversal skills are classified in 6 groups:

- **T1 - core skills and competences** (3 skills): skills and competences representing the foundation for interacting with others and for developing and learning as an individual. They comprise the ability to understand, speak, read and write language(s), to work with numbers and measures and to use digital devices and applications;
- **T2 - thinking skills and competences** (4 skills): skills and competences relating to the ability to apply the mental processes of gathering, conceptualizing, analysing, synthesizing, and/or evaluating information gathered from, or generated by, observation, experience, reflection, reasoning, or communication. They include the ability to eva-

luate and use information of different kinds to plan activities, achieve goals, solve problems, deal with issues and perform complex tasks in routine and novel ways;

- **T3 - self-management skills and competences** (4 skills): skills and competences requiring individuals to understand and control their own capabilities and limitations and use this self-awareness to manage activities in a variety of contexts. They include the ability to act reflectively and responsibly, to accept feedback, adapting to change and to seek opportunities for personal and professional development;

- **T4 - social and communication skills and competences** (5 skills): skills and competences relating to the ability to interact positively and productively with others. This is demonstrated by communicating ideas effectively and empathetically, coordinating one's own objectives and actions with those of others and acting in ways which are structured according to values, ensuring the well-being and progress of others, and offering leadership;

- **T5 - physical and manual skills and competences** (2 skills): skills and competences relating to the ability to perform tasks and activities requiring manual dexterity, agility and/or bodily strength. This is demonstrated by carrying out tasks and activities in demanding or hazardous environments requiring endurance or stamina. These tasks and activities may be carried out by hand, with other direct physical intervention, or by using equipment, tools or technology (such as ICT devices, machinery, craft or musical instruments) which requires guidance, movement or force;

- **T6 - life skills and competences** (6 skills): skills and competences relating to the ability to process and use knowledge and information which has transversal significance and facilitates active citizenship. They comprise the areas of health, environment, civic engagement, culture, finance and the application of general knowledge.

For each transversal skill the database contains the description and a list of possible alternative labels (synonyms) and narrower skills/competences referring to it.

Table 1 below details the 24 soft skills that are currently present in ESCOs, indicating for each of them the description, the list of the related, narrower skills/competencies, and possibile references for their assessment, with particular attention to european or international reference frameworks.

Name of transversal skill/competence	Description
T1 - Core skills and competences	
T1.1 Mastering languages	Communicate through reading, writing, speaking and listening in the mother tongue and/or in a foreign language.
T1.2 Working with numbers and measures	Apply numerical and mathematical content, information, ideas and processes to meet basic demands of learning and work. This includes an understanding of numbers, patterns, shape and space, the mathematicwal language, symbols and procedures, and ways of thinking used to achieve concrete goals.
T1.3 Working with digital devices and applications	Carry out simple digital tasks like operating already configured hardware, finding information via web searches, using standard software for communicating or collaborating with others or for creating and editing simple content and choosing between standard measures for protecting devices, personal data and privacy in digital environments.

Table 1. Transversal skills and competencies included in ESCO 1.1 classification and possible reference frameworks for assessment (source: drawn up using ESCO data).

Narrower skills/ competences	Possible reference framework for assessment
- Different languages	Assessment framework at EU level: Common European Framework of Reference for Languages (CEFR). 6 Levels from A1 Breakthrough to C2 Mastery. 4 dimensions: listening, reading, speaking and writing.
- Calculate probabilities - Carry out calculations - Interpret mathematical information - Process spatial information	Pearson International Edexcel Award in Number and Measure (Level 1 and Level 2)
- Apply basic programming skills - Apply digital security measures - Conduct web searches - Create digital content - Manage digital identity - Operate digital hardware - Use communication and collaboration software	The cluster is restricted to foundational digital skills increasingly becoming more important in learning, work and private life. It is building on the DigComp 2.1 framework, notably proficiency levels 1 and 2. DigComp 2.1 skills of proficiency level 3 and above are not considered transversal. Skills referring to information and data literacy or media literacy are listed under 2.1.1 Critically evaluate information and its sources.

Name of transversal skill/competence	Description
T2 - Thinking skills and competences	
T2.1 Processing information, ideas and concepts	Evaluate, input, record, transcribe and update data using electronic or manual information systems.
T2.2 Planning and organising	Direct activities and tasks, establish schedules and coordinate the activities of groups and individuals to complete objectives on time and within budget.
T2.3 Dealing with problems	Develop and implement solutions to practical, operational or conceptual problems which arise in the execution of work, in a wide range of contexts.
T2.4 Thinking creatively and innovatively	Generate new ideas or combine existing ones to develop innovative, novel solutions.

Narrower skills/ competences	Possible reference framework for assessment
- Memorise information - Think analytically - Think critically - Think holistically - Think quickly	*DigComp*, *GreenComp*
- Organise information, objects and resources plan	MSI Project Management Essentials Certified (PMEC)™ - free; PMI Project Management Ready™ Certification – for a fee; EPM (European Project Management) Fundamentals – for a fee
- Identify problems - Solve problems	*GreenComp*
- Improvise - Think creatively - Think innovatively	*EntreComp*

Name of transversal skill/competence	Description
T3 – Self-management skills and competences	
T3.1 Working efficiently	Achieve objectives independently using optimal amount of time, effort, or cost.
T3.2 Taking a proactive approach	Accept responsibilities for managing activities and adopt a forward-looking approach to anticipate problems but also identify opportunities.
T3.3 Maintaining a positive attitude	Withstand adversity, demonstrate resilience and find ways to resolve or manage the effects of difficult life events.
T3.4 Demonstrating willingness to learn	Show a positive attitude towards new and challenging demands and take steps to learn from difficulties.

Narrower skills/ competences	Possible reference framework for assessment
- Attend to detail - Maintain concentration for long periods - Manage quality - Manage time - Meet commitments - Work efficiently - Work independently	*EntreComp*
- Assume responsibility - Make decisions - Manage personal progression - Show commitment - Show determination - Show initiative	*LifeComp*
- Approach challenges positively - Cope with stress - Cope with uncertainty - Manage frustration - Show confidence	*LifeComp*
- Accept criticism and guidance - Adapt to change - Demonstrate curiosity - Demonstrate willingness to learn - Exercise self-reflection - Keep an open mind	*LifeComp*

Name of transversal skill/competence	Description
T4 – Social and communication skills and competences	
T4.1 Communicating	Express and exchange information, ideas, concepts, thoughts, and feelings, and resolve disagreements in formal and informal contexts, through the use of shared systems of words, signs, and rules.
T4.2 Supporting others	Guide or help less experienced or less knowledgeable people, and provide support to distressed people.
T4.3 Collaborating in teams and networks	Support or develop a group to work towards a common goal in a way which shows understanding and respect of others' roles and competencies. Support or develop a group to work towards a common goal in a way which shows understanding and respect of others' roles and competencies.
T4.4 Leading others	Guide, direct and motivate others.
T4.5 Following ethical code of conduct	Carry out workplace activities according to accepted principles of right and wrong, including fairness, transparency and impartiality in work practices and conduct towards other people.

Narrower skills/ competences	Possible reference framework for assessment
- Address an audience - Moderate a discussion - Negotiate compromises - Promote ideas, products, services - Report facts - Resolve conflicts	*LifeComp*
- Advise others - Ensure customer orientation - Instruct others - Show empathy	*LifeComp – EntreComp*
- Build networks - Demonstrate intercultural competence - Work in teams	*LifeComp – EntreComp - GreeComp*
- Build team spirit - Delegate responsibilities - Lead others - Motivate others	*EntreComp*
- Comply with regulations - Demonstrate loyalty - Demonstrate trustworthiness - Respect confidentiality obligations	*GreenComp*

Name of transversal skill/competence	Description
T5 – Physical and manual skills and competences	
T5.1 Manipulating and controlling objects and equipment	Move or lift objects, or use equipment, tools or technology with precision.
T5.2 Responding to physical circumstances	React and adapt to changing or hazardous physical conditions.
T6 – Life skills and competences	
T6.1 Applying health-related skills and competences	Care for own and others' mental and physical well-being and apply basic health standards, including hygiene. Obtain and use health information, and identify and access services and agencies that offer healthcare and guidance. Manage the negative effects of chronic health conditions.
T6.2 Applying environmental skills and competences	Reflect on the short and long-term impact of individual behaviours on the physical and social environment and adopt a sustainable work and lifestyle. Recognize the individual and collective responsibility for the protection and restoration of the local and global environment and inspire others.

Narrower skills/ competences	Possible reference framework for assessment
- Move objects - Use equipment, tools or technology with precision	
- Adjust to physical demands - React to physical changes or hazards	
- Apply hygiene standards - Demonstrate awareness of health risks - Maintain physical fitness - Maintain psychological well-being - Make an informed use of the health-care system - Manage chronic health conditions - Protect the health of others	*LifeComp*
- Adopt ways to foster biodiversity and animal welfare - Adopt ways to reduce negative impact of consumption - Adopt ways to reduce pollution - Engage others in environment friendly behaviours - Evaluate environmental impact of personal behaviour	*GreenComp*

Name of transversal skill/competence	Description
T6.3 Applying civic skills and competences	Interact with citizens and engage in communities, by evaluating information and its sources, reflecting on own ideas, values and roles and recognizing and respecting the ideas, values and roles of others.
T6.4 Applying cultural skills and competences	Express and interpret ideas, experiences and emotions creatively. Adopt an openness to learning from different cultural and artistic expressions.
T6.5 Applying entrepreneurial and financial skills and competences	Manage own and others finances and resources. Demonstrate perseverance, openness to opportunity and risks, the ability to mobilize resources and willingness to learn from experience.
T6.6 Applying general knowledge	Access and apply basic knowledge related to science, technology and engineering, to social sciences and humanities and to philosophy, ethics and religion.

Narrower skills/ competences	Possible reference framework for assessment
- Critically evaluate information and its sources - Exercise rights and responsibilities - Participate actively in civic life - Promote the principles of democracy and rule of law - Respect the diversity of cultural values and norms	*GreenComp*
- Appreciate diverse cultural and artistic expression - Express yourself creatively	
- Manage financial and material resources - Show entrepreneurial spirit	*EntreComp*
- Applying knowledge of philosophy, ethics and religion - Applying knowledge of science, technology and engineering - Applying knowledge of social sciences and humanities	

Soft skills as an open system: new soft skills

2.3

The framework of soft skills can be considered as an open system, in that over time new transversal and non-job-related competences may emerge to enrich the landscape of existing ones. In this direction, two soft skills will be examined in this chapter on which more and more attention is being focused, those related to future literacy and sustainability, considered strategic (and in many cases synergic with each other) to face the complexity of global challenges related to social, climatic, political and economic phenomena.

Starting in the first decade of the 2000s, the need emerged to bring competences relating to these soft skills into a common reference framework, in order also to make them assessable and certifiable. To date, this process is still in progress and highlights the very close connection between future literacy and sustainable competences.

In fact, already before the publication of Agenda 2030, some authors had questioned the methodologies needed to promote the principles of sustainability in a lifelong learning approach. That study (cited by Giliani, 2019 p. 228) had highlighted the following competencies:

- **systemic thinking**, i.e. knowing how to recognise and understand the relationships between several phenomena and how to analyse complex systems;
- **forecasting skills**, i.e. knowing how to make predictions by assessing the various consequences associated with an action and to know how to manage these assumptions by making decisions;
- **normative capacity**, i.e. knowing how to understand the norms and values underlying actions and knowing how to negotiate values and principles according to the situation or circumstance;

- **strategic thinking**: knowing how to hypothesise, develop and implement innovative actions;
- **collaborative capacity**: knowing how to learn from others, understanding and respecting each other's needs, managing conflicts effectively;
- **critical thinking**: being willing and able to question norms and practices, taking a position by supporting one's point of view with plausible arguments;
- **self-awareness**: knowing how to reflect on one's function in the community, knowing how to evaluate and motivate what underlies one's actions;
- **integrated problem solving**: being able to hypothesise solutions from several problem-situations and being able to integrate one's knowledge and skills to solve them.

This section presents for the new soft skills an initial theoretical framework and the state of the art of existing projects and experiments aimed at contributing to a definition of competences, referring the analysis of aspects relating to their assessment and possible validation/certification to Chapter 4.

With reference to the ESCO 1.1 transversal skills sub-pillar classification, the competence relating to future literacy does not yet have a place: its insertion as a narrower skill within skill T2.4 Thinking creatively and innovatively is therefore proposed on an experimental basis, and may constitute an important enrichment. Competences relating to sustainability, on the other hand, already find an ESCO reference mainly in skills T6.2 *Applying environmental skills and competences* (recently inserted) and T6.3 *Applying civic skills and competences*. The name of T6.2 skill is not fully convincing and could be changed toT6.2 *Applying core skills and competences for the green transition*.

Future literacy: definition and state of the art

2.3.1

Future studies grew out of the need for politicians to deal with post-war uncertainties in the 1950s, developing as an attempt to design policies and plan for the future. In the following decades, future studies and methods entered many scientific, social, and economic fields.

In companies, futures studies are proving to be strategic in understanding the complexities of markets and consumer preferences, later expanding into business contexts in sectors such as ICT, engineering, the aerospace industry, and the medical and healthcare sector. They are being adopted in organisational and managerial, entrepreneurial and, more recently, are being incorporated into orientation and employability pathways.

The essential characteristic of future studies is that they adopt essentially qualitative methods of data collection and analysis, looking at the medium to long term (e.g. 10 years), where the raw material of the narratives elaborated is the interchange of ideas between different types of participants: content experts, decision-makers, but also users, customers, ordinary people. Underlying this approach is future literacy, a soft skill that enables the imagination to be unleashed, emancipates people and opens minds to new individual and community/organisation perspectives. According to UNESCO (2012) and Miller (2018), Futures Literacy is a capability and can be defined as: *"The skill that allows people to better understand the role of the future in what they see and do. Being futures literate empowers the imagination, enhances our ability to prepare, recover and invent as changes occur"* [Unesco, 2012].

The term "Futures Literacy" adopts the idea of a skill that everyone can acquire (as reading or writing), and that everyone could be able to reach. This because the future does not yet exist, it can only be imagined, and everyone is able to imagine and/or is able to learn to imagine the future, becoming a 'futures literate'. Miller (2018) explains that *"A futures literate person has acquired the skills needed to decide why and how to use their ima-*

gination to introduce the non-existent future into the present. These anticipatory activities play an important role in what people see and do. Developing a detailed description of this capability to 'use-the-future' calls for an analytical framework that can clarify the nature of different anticipatory systems and guide both research into FL and its acquisition as a skill."

The same author (Miller, 2015) provides a further definition: *"Futures Literacy is the capacity to design and implement processes that make use of anticipation, generally with the purpose of trying to understand and act in a complex emergent context. The diffusion of Futures Literacy, is one way of improving the capacity of individuals and organisations to: a) detect and give meaning to discontinuity, and b) thereby becoming more capable of initiating learning processes ".*

One of the key elements to consider about the Future Literacy, is that there are different types of future and the images, ideas, visions and concepts of the future that we choose to follow will be used and reflected in the present that we create and experience. About this aspect, Inayatullah (2008) underpins that the problem is that our imagination is often limited by the ways in which we have been taught to perceive ourselves in the present, and thus to be able to imagine our possible futures. The same author has described some conceptions of the future that can limit our ability to imagine, create and act, and as consequence, people often believe that there is only one future. But by looking for alternatives, and using the capabilities connected to future literacy, it is possible to see something new and different. Futures Literacy skills lead to the discovery and recognition of our anticipatory assumptions and enhance our ability to imagine different ways in which we can frame our potential futures, not only the desiderable and probable ones.

If future skilled, persons can learn to use the future in a way which embraces alternative perspectives, accepts uncertainty, builds resilience and welcomes opportunity. By doing so, we can open ourselves to more positive, inclusive and diverse futures. With futures literacy and skills, it is possible to reframe our perceptions, and rethink how we can imagine and create new futures, are a key method to achieve this new conception of the future.

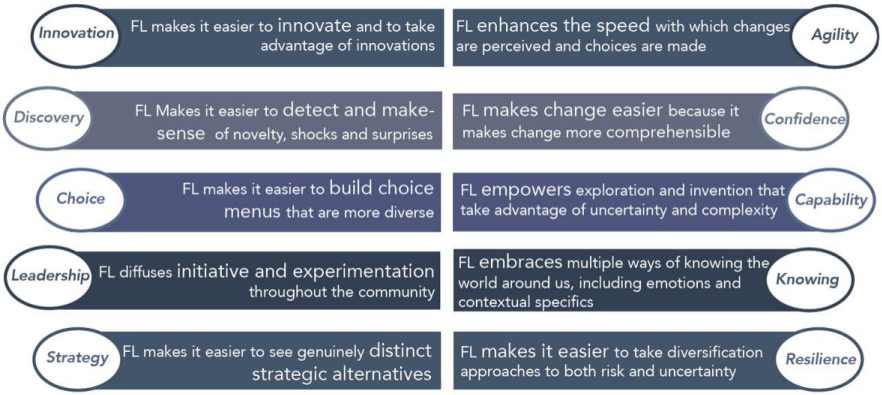


Fig. 1. Ambiti applicativi della future literacy (source: https://en.unesco.org/futuresliteracy/about).

Talking about Futures Literacy, learning tools and methods therefore means 'Working with the Future' (Miller, 2008 et seq., UNESCO, 2012, Poli, 2019), in order to:

- learn how to use the future in the present;
- anticipate the effects of changes in real, individual and collective life;
- make robust, forward-looking and effective choices and decisions;
- identify possible crises or challenges on the horizon;
- realise the goals of the 2030 Agenda for a more sustainable world for all, today and tomorrow;
- reinvigorate people's sense of confidence for a better future.

This implies the acquisition (through training) of certain necessary skills such as, for example, the ability to distinguish between different types of futures, but also the acquisition of useful tools (the 'methods') to be applied in order to make strategic choices in the present, but oriented towards one or more (possible, plausible, probable) futures. The acquisition of tools takes place through the study of futures (Futures Studies), of which futures exercises are a fundamental part

and are articulated on three levels: forecast, foresight and anticipation. There are many types of methods (e.g. quantitative, qualitative, exploratory and normative), but beyond the many classifications that can be found in the literature, the common denominator is to broaden the mental frameworks of those involved and build different strategies to understand the ways in which the environment is changing, to revise and align reference values, to develop new ideas, to manage conflicts and to intercept possible changes that are not yet visible. Skills that can be applied in any working, professional but also life environment. As remarked by Ehlers (2020, p. X in Preface) about Future Skills:

"…all approaches have in common – they all reflect the changed social conditions for work, education and life and analyse important Future Skills. Many of these concepts focus on skills in a digitalized world. In particular those are focusing on digital data-related skills which originated already in the 1990s and 2000s and were discussed there as digital or information literacy. These approaches are now often enriched with important intercultural communication and cooperation skills. In other Future Skills approaches, the topic appears as a continuation of the concept of lifelong learning, in order to ensure a fit between constantly changing requirements on the one hand side and the capabilities of the individual to cope with them on the other hand side. This comes along with a strong focus on an economic impetus of participation of the individual in the labour market, sometimes also coloured differently as Skills for Life." (Ehlers, 2020, p. X)

Precisely because of their transversality, it is hard to find approaches that attempt to establish a more holistic educational reference frame within a widened understanding. Thus, the emerging question is: how the educational and VET system can master the future and as to what the future of higher education looks like? And, even before that, what are the competences related to future literacy, how can they be included in a curriculum, evaluated and validated?

Some attempts in this direction emerge from recent European experiences, including the research work carried out within the BeFore project (Becoming Future-Oriented Entrepreneurs in universities and companies - beFORE), funded by Erasmus Plus (2017-19), which starts from the problem of the lack of recognition of future literacy skills in entrepreneurial pathways, where anticipatory vision should be an integral part of the pathway, as a key competence to face global challenges, changes and complexity.

The final project report analyses globally the existing educational offer is still not homogeneous but fragmented and, where futures studies are included in the curricula, they are usually distinguished by offering separate degrees in Futures Studies, where the focus is on the development of methods and the interdisciplinary approach is left out.

An interesting analysis of the evolution of futures skills and the complexity of making them 'operationalizable' is provided by a recent essay by Ehlers (2020) in which he refers to futures skills as '21st century competences'.

"21st Century or Future Skills are a recently emerging research topic by the World Economic Forum, UNESCO, the European Commission or the OECD, which deals with the question which graduate attributes are particularly relevant in order to act in an increasingly globalised and digitised world in a socially creative, responsible, sustainable way and in accordance with the Millennium and Sustainable Development Goals. Despite many years of discussion and research the embedding and integration of effective skill development is still considered "difficult to operationalize effectively". (Ehlers, 2020)

According to the author, the existing approaches generally consist of lists of more or less important skills but are not based on sound competence theory approaches. Then, he underpins that:

"A research on the currently available Future Skills approaches, models and concepts can only remain incomplete. This field is too dynamic and the understanding of what belongs to Future Skills is too diverse, what maybe is called 21st Century, but actually means Future Skills, or what relates to certain educational sectors – such as schools, teacher training, higher education Institutions, individual university disciplines, such as engineering (i.e. The Engineer 4.0) or economics (i.e. Leadership Skills for Managers) – or content domains, such as MINT/ STEM Skills. Due to this heterogeneity a contentwise analytical comparison of the approaches is not useful". (Ehlers, 2020)

However, the approaches can be presented side by side using uniform criteria of skills in order to get an impression of the scope and coverage of the respective approaches. In order to ascertain these criteria, a metanalysis has been carried out with the help of the keywords "Future Skills", "21st Century Skill", "Future Learning", "Future higher education". The final result of this analysis lead to identify 33 comparison criteria, divided into three categories constructed in the *Triple Helix-Model for Future Skills* – such as skills that refer to subjective individual competences, i.e. the ability to reflect, those that refer to items, objects or content-related areas of expertise, i.e. STEM competences (object-related competences), and those that refer to competences in dealing with the social environment, namely organisational competences.

The Futures Skills, which are most often seen in a compared approach, are the following:

- Creativity;
- Analytical and critical thinking
- Intercultural knowledge and understanding;
- Learning skills;
- Action & Initiative;
- Taking Responsibilty;
- Digital & Data Literacy;
- STEM skills, complex problem solving;
- Communication skills (language, symbols, texts);
- Co-operation skills;
- Teamwork;
- Leadership skills;
- Networking skills;
- Context awareness and adaptibility;
- Ability to interact appropriately and effectively.

Among the competencies identified by the European BeFore project were the following skills related to foresights:

- **insight** – interpreting and responding to the present, assessing state of the art of factors shaping the activity;
- **visioning** – developing a vision for the future (both collective and individual);
- **strategy developement**– a plan of action designed to achieve a long-term goal, capable of being changed in response to shifting market/social dynamics;

- **innovating** – applying new ideas to produce a tangible business result such as a new product, service, or process;

- **leadership** – leading a group of people within organization, establishing a clear vision, sharing it with the employees and stakeholders, coordinating and balancing the conflicting interests of groups and stakeholders.

About it, an added-value from the conducted literature review refers to a recommendation to consider the inclusion of Foresight Styles Assessment (FSA) approach (Dian 2009; Gary 2009; der Laan, Erwee 2012) as a communication tool in BeFore project. FSA describes the variety of behaviors related to human ability to plan and visualize the future and react to external change. It could be used in the project as a tool that will help prospective users of the project online offer to understand the value of futures thinking and acting.

According to the research led by BeFore project, the set comprised such competences as:

- the ability to define, identify and analyze trends within micro- and macro-environment;

- the ability to find and interpret weak signals of change and disruptions (wild cards and abnormal phenomena);

- the ability to work in teams;

- the ability to act proactively (autonomous strategic behavior, enterprising spirit;

- reflexive capacity;

- the ability to manage change and uncertainty (also dynamic capability);

- the ability to build networks both internally and externally;

- the ability to deal with complexity;

- the ability to develop and implement strategies;

- the ability to think out of the box;

- the ability to transform new ideas into business practice;

- the ability to implement scenario approach within organization;
- the ability to create organizational vision (both collective and individual);
- seeing the big picture.

In the next stage of the research process, (after the analysis of the final set of the above mentioned 14 competences and reviewing the data mining work), the consortium of BeFore Project agreed to further explore a list of 39 competences. The further works resulted in the obtaining of a list of atomic competences that as such are comparable to each other. The list comprises different levels of competences, identified as (1) meta and (2) specific (or micro).

For the further analysis, consortium agreed to focus on 12 competences:

- adaptability/Flexibility;
- analysing data or information;
- critical thinking;
- developing objectives and strategies;
- inductive reasoning;
- influencing others;
- interpreting the meaning of information to others;
- making decisions and solving problems;
- problem sensitivity;
- reflexive capacity;
- systems analysis;
- thinking creatively.

Fig. 2. Future skilsl framework (source: BeFore project)

Future Skills are a specific profile of existing concepts of competence and studies and literatures demonstrate that *Future Skills* contain competencies that are important for future action situations: we could say it is a soft skill of soft skills. The impact on an individuals' abilities is depending on the personal emotional value-related constitution, on the respective state of knowledge and the extend of introducing this to one's environment or how the environment can enrich one's actions. To assess these capabilities will be strategic in the next years, since futures literacy is connected to sustainibility, digitalization and long term transformation.

Sustainability-related skills

2.3.2

An increasing number of companies are adopting a sustainable approach in their business strategies, i.e. in line with the UN's Agenda 2030 Goals and declined according to the 3Ps (People, Planet, Profit). This is a profound transformative and evolutionary process that requires companies to move towards production, organisational and management models that are completely different from the past. While initially this transformation seemed to concern mainly only multinationals or large companies, in recent years it has started to spread with increasing rapidity also to small and medium-sized companies in all sectors. This acceleration has occurred as a result of a mix of factors, for example the introduction of mandatory regulations and policies (mostly from EU sources) (e.g. compulsory certification related to environmental impact, obligation to demonstrate respect for workers' rights, etc.), but also as an effect of incentive measures (e.g. social clauses included in public tenders), the transformation of markets, supply chains and customers/consumers increasingly attentive to the 'sustainable' dimension of the company. There is a growing attention to ESG (environmental social governance) criteria in the evaluation of companies in order to achieve the creation of a virtuous ecosystem in which profit is not necessarily at odds with environmental protection and social inclusion. Small and medium-sized enterprises (SMEs) are also approaching this world, approaching ESG reporting with the drafting of sustainability reports and participation in ethical ranking. However, in order to be adopted and made strategic, these tools require that the organisational culture presents a widespread approach to sustainability, and this requires that all the human resources of an organisation possess consistent and adequate soft skills.

But what are the skills for sustainable companies? Sustainability is closely linked to (and contributes to) innovation in products, processes, business models and the supply chain. Sustainability also requires collaboration and cooperation (through stakeholder engagement): since it imposes challenges that increasingly go beyond the possibilities of the individual company, it

also requires new skills or skills that are declined in a different way than in the past, but it also requires knowing how to read the context and its players in a different way, opening up, for example, to subjects from the public administration, the third sector, local communities and going beyond just customers and suppliers. Moreover, completely new skills are required in this system, with elements of both hard skills and soft skills: a cross-skilling process in this case will therefore be decisive for managing sustainability, because, for example, on the one hand it will be necessary to know how to use new technologies, but also to know how to collaborate across disciplines and functions. What clearly emerges is the complexity and the need for a systemic approach and multidimensional competences, i.e. managerial, technical-applicative and social, which enable the company to operate according to the principle of the three 'P's: people, planet, profit.

The approach to sustainability also means being able to adopt anticipatory approaches (thanks to the future skills and foresight methods mentioned in the previous paragraph), which make the organisation capable of adapting to major transformations (megatrends) or to the emergence of signs of change or new needs/challenges coming not only from the reference market, but also from society, from the context. For example: increasing urbanisation, the spread of online shopping, green and shared mobility or digitalisation. Analysts now consider it crucial - for the sustainable competitiveness of companies - to have skills that enable all people in the company to read problems as opportunities and to be active in identifying solutions with creative, flexible and innovative methods to adapt to a work that is defined by some authors as 'protean' (Alessandrini, 2019 p.108).

The EU has placed sustainable development among its priorities and it is a central dimension in the long-life learning strategies planned for education and training in the period 2019 - 2024.

Among others, the European Green Deal (2019), the European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience (2020), and Achieving the European Education Area by 2025 (2020) have underscored *the need to develop a European competence framework on sustainability.*

Considering this goal, the European Commission has developed a reference framework on sustainability competences at EU level (*GreenComp*, 2022). It provides a common ground to learners and guidance to educators, providing an agreed definition of what sustainability as a competence entails. Such a shared understanding can act as a catalyst for learning for environmental sustainability by supporting education and training institutions to develop, review and adapt their vision and practices with regard to teaching and learning for sustainability.

GreenComp (2022) has adopted the following statement to define a **sustainability competence: "A sustainability competence empowers learners to embody sustainability values, and embrace complex systems, in order to take or request action that restores and maintains ecosystem health and enhances justice, generating visions for sustainable futures".**

According to the same framework, this definition focuses on:

- developing sustainability knowledge;
- skills and attitudes for learners so they can think, plan and act with sustainability in mind;
- to live in tune with the planet.

In this approach, all types of learning – formal, non-formal, and informal – are considered as vectors for developing this competence in a long-life learning approach (children/adults) and sustainability is a competence that can be applied to all spheres of life, both on personal and collective levels.

The *GreenComp* Report (2022) makes it possible to derive a common framework of competences with regard to both future literacy and sustainability competences, thus providing an initial frame of reference for the training system.

In this scenario, the importance emerges of adopting an approach based on capabilities (Alessandrini, 2019), in which the training agency can guarantee the development of a critical and conscious approach, expendable both within the work organisation and in life, as well as in transition phases and situations characterised by complexity. As Alessandrini (2019,

p. 167) points out, sustainable learning is expressed in the "transformative (pedagogical) action" that finds informal and peer learning processes preferable from a pedagogical point of view, with a high emotional involvement, through the use of the narrative approach and participative, cooperative and collaborative methods with the use of problem-solving-oriented situations (ibid., p. 167).

Lastly, it is important to recall what the Italian national school system provides for future skills and sustainability competences. In particular, with the Plan for Education for Sustainability, the Italian Ministry of Education since 2017 (Invalsi, 2020) has translated the goals indicated by the UN 2030 Agenda into 20 concrete actions. The Plan stems from the work of the *National Conference on Environmental Education and Sustainable Development* (Rome, 22-23 November 2016), where a document was drawn up containing some of the strategic objectives in the learning area of education for sustainable development. These included:

- Conveying the complexity and interdependence of global challenges in order to act consciously in daily life and promote sustainable transition;
- Teaching how to critically evaluate behaviour, both individual and collective, and how to recognise virtuous experiences and the real contribution of innovation and technology;
- Strengthening children's relationship with the environment, resources and natural and socio-cultural diversity.

AREA	COMPETENCE	DESCRIPTOR
1. *Embodying sustainability values*	1.1 **Valuing sustainability**	To reflect on personal values; identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values.
	1.2 **Supporting fairness**	To support equity and justice for current and future generations and learn from previous generations for sustainability.
	1.3 **Promoting nature**	To acknowledge that humans are part of nature; and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems.
2. *Embracing complexity in sustainability*	2.1 **Systems thinking**	To approach a sustainability problem from all sides; to consider time, space and context in order to understand how elements interact within and between systems.
	2.2 **Critical thinking**	To assess information and arguments, identify assumptions, challenge the status quo, and reflect on how personal, social and cultural backgrounds influence thinking and conclusions.
	2.3 **Problem framing**	To formulate current or potential challenges as a sustainability problem in terms of difficulty, people involved, time and geographical scope, in order to identify suitable approaches to anticipating and preventing problems, and to mitigating and adapting to already existing problems.
3. *Envisioning sustainable futures*	3.1 **Futures literacy**	To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future.
	3.2 **Adaptability**	To manage transitions and challenges in complex sustainability situations and make decisions related to the future in the face of uncertainty, ambiguity and risk.
	3.3 **Exploratory thinking**	To adopt a relational way of thinking by exploring and linking different disciplines, using creativity and experimentation with novel ideas or methods.
4. *Acting for sustainability*	4.1 **Political agency**	To navigate the political system, identify political responsibility and accountability for unsustainable behaviour, and demand effective policies for sustainability.
	4.2 **Collective action**	To act for change in collaboration with others.
	4.3 **Individual initiative**	To identify own potential for sustainability and to actively contribute to improving prospects for the community and the planet.

Table 2. GreenComp areas, competences, and descriptors (source: EC, GreenComp, 2022)

The ministerial document also emphasises that for education for sustainability to be a vector for the development of disciplinary, personal and social skills for children and express its transformative and evolutionary power, it must have certain fundamental characteristics. These include:

- interdisciplinarity: sustainable development is not a discipline in its own right but must fit into the whole curriculum by occupying a cross-curricular area of learning;
- acquisition of values: education for sustainability should aim at conveying an understanding of certain values centred on sustainable development rather than passing on notions;
- development of critical thinking and problem-solving: young people should become more self-aware in relation to sustainable development and equip themselves with the tools to seek concrete answers in their own lives;
- multiplicity of methodologies: innovative teaching methodologies and multimedia materials must be used, open-air and interactive activities must be envisaged;
- shared and participatory decision-making: students must be invited to actively participate in learning planning;
- the importance of the local context: special attention should be paid to local issues so that they are also useful for understanding global issues.

The determination of competence targets and specific learning objectives for civic education has been postponed until the school year 2023/2024. Until then, assessment will refer to the learning objectives/achievements and competences that schools will adopt autonomously.

3.0 Identification of most important soft skills for the EUSALP context

The objective of this chapter is to identify a limited set of soft skills that are particularly significant for learning processes in the VET area, selected on the basis of a series of factors that refer:

- to the geographic-economic theme of the EUSALP cooperation area, i.e. to the economy and labour market of the Alpine arc, with particular reference to the sectors and professional figures that most characterise them;
- the theme of Work-Based Learning and dual education models, which represent one of the priority fields of attention of EUSALP Action Group 3
- the topic of transnational mobility of learners which represents a possible field of cooperation between the actors of the VET systems of the different EUSALP regions/provinces.

This set of soft skills is intended to represent a reference for the design and evaluation of learning pathways in the VET area, able to develop a minimum set of competences that can favour the learning of technical-professional skills and the insertion of young people in the labour market.

Soft skills for Work-Based Learning

3.1

Work-based learning (WBL) methodologies represent one of the consolidated fields of attention of the EUSALP Action Group 3. On this topic, INAPP (2019) has produced a Report "Dual systems in the Regions of the Alpine Space", that is a comparative study on dual education models in Alpine countries and regions, in order to come up with a set of recommendations and guidelines aiming to enhance the governance structures and mechanisms. Even if the report is more focused on the analysis of the dual systems in the countries of the Alpine Space than on the analysis of skills gaps or labour marked needs, the final recommendation n. 8 Ensuring the effectiveness of apprenticeship upon labour market innovations, enhancing the value of social investment in human capital can represent the point of reference in which to frame the contents of this work.

According to INAPP the enhancement of tools and methods for the analysis and the forecast of the required skills can bring an important contribution for the fulfilment of the above-mentioned objective, as well as the development of updating and specialisation initiatives for on-the-job trainers and vocational school teachers on the innovative skills required by the labour market. The report underlines the impact of the technological innovation on production and working procedures that bring also to the necessity of a higher flexibility in the deployment of the personnel, and professional versatility. An effective response to these new needs can be given by reducing the specialisation of qualifications, e.g. by combining a modular approach for apprenticeship training with the identification of a broad and uniform common base of general and cross-sectoral knowledge and skills.

The soft skills represent precisely this common basis on which to then graft the development of technical and vocational skills specific to each qualification.

As far as the definition of work-based learning is concerned, it was decided to use a sufficiently broad concept such as the one

developed by the Interagency Group on Technical and Vocational Education and Training (IAG-TVET - formed by Cedefop, European Commission, European Training Foundation, International Labour Organization, Organisation for Economic Cooperation and Development, UNESCO), according to which (IAG-TVET, 2016, p. 2):

- work-based learning "refers to all forms of learning that takes place in a real work environment";
- work-based learning "usually – but not always – combines elements of learning in the workplace with classroom-based learning";
- the most common types of work-based learning are apprenticeships, internships/traineeships and on the-job training.

While much work confirms the usefulness of WBL in improving beneficiaries' ability to enter the labour market, some studies have also highlighted the risk that, in the medium to long term, the positive effects of WBL on participants' employability may diminish or even disappear.

Indeed, a recent Cedefop study (Cedefop, 2021) points out that the high specificity of the skills initially developed (occupational-, job- and company-specific skills) expose them to the risk of being less adaptable to changes in technologies, organisations, employers, jobs or careers. (Hanushek et al., 2011; Forster et al., 2016; Acemoglu and Pischke, 1998). On a similar line, some authors argue that, although development of cognitive transversal skills can and do occur in programmes with a work-based component, based on empirical evidence, they challenge the idea that this can achieve the same results obtained with other types of education and training (Hughes et al., 1999; Nijhof and Nieuwenhuis, 2008), which devote more specific learning time to this end. A special focus on the development of soft skills can be an effective strategy to mitigate these risks, as these skills are by their nature less prone to obsolescence and indeed encourage continuous updating, self-assessment, and the ability to plan professional career development.

Soft skills and WBL: a literature review

3.1.1

This chapter focuses on the research on what are the most effective soft skills to foster and accompany learning processes in the WBL context: the results of some recent research allow us to gather interesting elements on this issue.

A first work (Tino et al., 2018) allowed to reconstruct, starting from the school-to-work alternance experience of a panel of 162 Italian high school students, a list of the soft skills most used and required in the company as they emerge from the perception of the students themselves (Tab. n. 3).

Type of competence	Frequency %
Interpersonal	54
Teamwork	52
Collaboration	40
Digital	37
Communication	33
Management	24
Sharing	22
Listening	17
Problem solving	17
Accountability	17

Table 3. The top 10 transversal skills most used and required in work-school alternance in Italy according to students' opinions (source: own elabor. on Tino et al., 2018)

With regard to the question of which non-technical skills were most important for the professional future of the young people interviewed, the survey highlighted the following s.s.:

- interpersonal skills;
- the ability and willingness to learn;
- digital skills;
- collaborative skills;
- communication skills;
- spirit of initiative;
- creativity;
- flexibility/adaptation;
- teamwork.

The survey results reinforce and legitimise the highly formative potential of pathways in which - as should be the case for WBL if properly implemented - theoretical construction is developed from reflection on practices, and in which practice is legitimised as a context in which "the learner learns through participation in expert practices and by taking part in a community" (Fabbri, 2007). The survey testifies to the importance of reflective practices on the WBL experience that are able to bring out in a conscious way the enhancement of soft skills that occurred, often implicitly, during the in-company experience. A critical point that emerges from the survey is that of the evaluation of soft skills which, at least in the Italian context, seem to be little considered with respect to other competences, of a scholastic and/or professional nature, more easily observable and assessable. Self-assessment practices, for example, seem to be more frequent and considered in companies than in schools.

"The problem that arises, in fact, with the implementation of an educational space outside the school, ... is not only to outline adequate plans so that it can be realised as a constructive experience, but also to identify new methods and evaluation tools that can be used within heterogeneous contexts, not always close to the school, and capable of measuring also and above all those competences, the soft skills, to which the school has so far paid relative attention although they themselves represent indispensable tools in the near future." (Tino et al., 2018, pag. 143)

While this study considers the development of soft skills from the perspective of the students involved, a second recent contribution (Cedefop/OECD, 2021) on perspectives for apprenticeships reports the results of an Engineering Academy (EA) survey at the University of Strathclyde (Scotland, UK) trying to identify soft skills that graduates should have at point of graduation. The survey, that involved over 100 employers and employees in UK, gave the results shown in Table n. 4.

Skills needed	% stating essential
Communication skills	78
Teamwork including leading/managing small teams	73
Commercial awareness	69
Behavioural skills (including timekeeping, diversity, attitude, resilience, and responsibility for career development)	67
Presentation skills (formal and informal)	65
(Technical) Report writing	64
Project management	64
Problem solving	62
Finance skills	49
Health & Safety training	49

Table 4. Soft skills needs of UK employers (source: Cedefop/OECD, 2021)

A third significant contribution selected comes from the experience of the Erasmus+ project VET-GPS, (VET-GPS, n.d.) which in 2018 carried out a field survey involving 175 experts mainly representing companies from Italy, Austria, Portugal and Spain. On the basis of an initial selection by desk-analysis of 10 soft skills considered important for the training of young VET trainees, the survey aimed to collect the opinion of companies on which are the most relevant soft skills that young workers must have to successfully integrate the labour market; and about the level of the domain of those soft skills of the trainees that are finalising their training path.

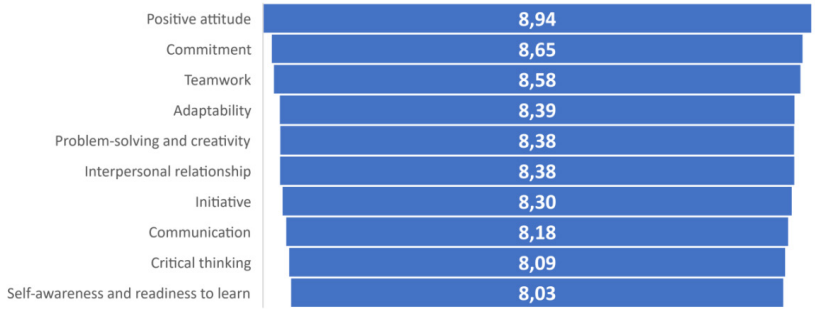


Figure No. 3 summarises the importance ranking that companies assigned to the 10 proposed soft skills.
Fig. 3. Rate of the relevance of 10 significant soft skills in the perspective of 175 organizations involved in an on-field survey within the VET-GPS Project (source: VET-GPS, n.d.)

Interesting evidence emerges also from a cross-country survey on soft skills conducted in an Erasmus Project, **Valorize High Skilled Migrants**, that gives a methodological approach for a common framework of soft skills at work, that can be easily applied both to natives and immigrant (Dall'Amico & Verona, 2015).

Soft skills are so important to keep high level of employability because these are the skills that an individual uses to interact with, interpret or inform social and physical environments. Employers look for employees who are not simply able to do the specific job they apply for, but who do it better than others. In a certain way soft skills represent the working style of a person (the way in which s/he carries out the tasks assigned). It is the personal style which makes any person unique. Moreover soft skills are strategic, not only because they can be applied in many different types of jobs, but also because they can empower persons (if aware of their own competences) to promote unique, themselves in a proper way to find better jobs and positively contribute to the working organizations. So soft skills contribute to work performance in combination with technical or hard skills and knowledge, basic skills (language, literacy and numeracy) and personal values, with the highest transferability level (Fig. n. 2)

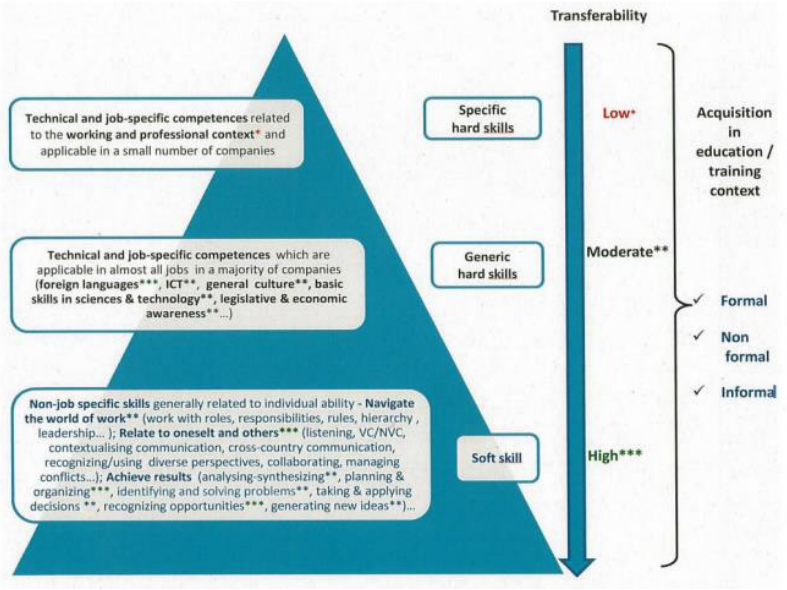


Fig. 4. Level of transferability of different types of skills (source: Dall'Amico & Verona, 2015)

On labour market hard skills are considered as a pre-requisite to get a job interview, but jobseekers need soft skills to get (and then keep) the job. As a matter of fact, employers want to hire workers/employers who will "fit in" to the workplace. So, when the job seeker faces the interview, the employer has generally already verified his/her hard skills (through his/her application, CV or a specific test); most of the time of the interview process is about determining whether he/she will be a good fit for the organization, which means that the focus will be on his/her soft skills.

This applies in every country to both native and immigrants as well, but it is even more critical for newcomers since soft skills tend to be culturally specific. Immigrants tend to emphasize their hard skills, even deciding to go back to school to get local degrees and qualifications, thus keep developing their hard skills, without realizing what a big barrier their lack of soft skills may be in their search of employ.

Within project activities a field survey on employers and recruiters was conducted in six countries (Austria, Bulgaria, France, Germany, Italy and Sweden) to analyse the main recruitment criteria used to select candidates and recruiters' perceptions on the so-called soft skills, for a total of 70 face-to-face interviews.

Results from the survey are quite interesting:

- soft skills are the third criterion, in order of relevance, for recruiting, after hard skills and prior experience and before educational background, IT skills, foreign languages skills, references, etc.;
- most important soft skills which are deemed lacking or must be improved, considering the company current workforce are: TIME MANAGEMENT, CREATIVITY & INNOVATION, TEAM WORKING, ADAPTABILITY & FLEXIBILITY, PROBLEM SOLVING;
- soft skills that, if lacking, may have the greatest negative impact on their company are motivation, decision making and problem solving, time management, team working, conflict management, communication skills, creativity & innovation.

The ranking of soft skills considered most important by the employers is shown in Table 5.

Skills	Level of importance (scale from 1 to 4)
Service skills (understanding of others' needs)	3,43
Team working	3,40
Adaptability and flexibility	3,38
Motivation	3,38
Time management	3,37
Managing responsibilities	3,28
Personale effectiveness and integrity	3,27
Communication	3,27
Learning to learn	3,22
Problem solving	3,18

Table n. 5. Rate of Importance of soft skills from the employers' survey (source: own elaboration from Dall'Amico & Verona, 2015)

Soft skills for WBL: conclusions

3.1.2

Considering that all the four studies considered expressed a list of soft skills considered strategic for the WBL context, ordered from the most important to the least important, we proceeded to identify the soft skills by weighing them in descending order of importance and calculating a synthetic index that takes into account both the frequency of presence of the soft skill in the various studies examined and the order of importance assigned. A problem that emerged from the comparison of the results of the various works is that of the use of different terminologies to indicate the same soft skill and, in certain cases, the difficulty of understanding exactly the contents of a certain soft skill. This is due, as already pointed out in chapter 2.1, to the absence of an unambiguous taxonomy and description of the various soft skills, which often generates problems of understanding by using terms that are not codified. In order to overcome these problems, we experimented with the use of the ESCO taxonomy and its syllabus of definitions to re-code the soft skills highlighted by the different works considered. In some cases, it was not possible to univocally assign the soft skill examined to the ESCO classification, as it was a synthesis of several ESCO soft skills. For example, the ability to manage interpersonal relationships is referred to in ESCO as both skill T4.1 "Communicating" and skill T4.3 "Collaborating in teams and networks". However, this experimentation was successful, making it possible to adequately compare the results of work by different authors. Table no. 6 summarises the results of this operation, which made it possible to identify the five soft skills considered strategic for the counter of work-based learning (the acronyms refer to the ESCO classification):

- in first place we find, by a wide gap (36 points out of a possible 40) what ESCO defines as T4.3 *Collaborating in teams and networks*. This is a soft skill present in all four jobs examined and always in positions of great relevance;

- in second place follows ESCO skill T4.1 *Communicating* which, as we have seen before, also represents a component of the skills indicated as interpersonal by various

works; in essence, the first two skills refer to the ability to work together with one's colleagues, a skill of fundamental importance in the work context;

- in third place we find the skill ESCO T3.1 *Working efficiently*, which refers to personal productivity in terms of, for example, time management, quality of work, concentration, etc;

- in fourth place we find skill ESCO T3.2 *Taking a proactive approach*, also linked to the personal skills sphere, which highlights the importance of commitment and responsibility in one's work;

- Finally, in fifth place comes ESCO T2.3 *Dealing with problems*, which belongs to the group of skills related to thinking.

Overall, the analysis of the research work relating to the relationship between WBL and soft skills revealed a varied set of skills with clear relationships between them: this is an important element for reflection that will be taken up in the final considerations in Chapter 3.4

Order of relevance	Tino et al., 2018	Cedefop/OECD, 2021
1	Interpersonal T4.1/T4.3	Communication T4.1
2	Teamwork T4.3	Teamwork 4.1
3	Collaboration T4.3	Commercial awareness T6.5
4	Digital T1.3	Accountability (Behavioural skills) T3.2
5	Communication T4.1	Communication - Presentation skills and writing - T4.1
6	Management T3.1/T6.5	Project management T2.2
7	Sharing T4.3	Problem solving T2.3
8	Listening T1.1/T4.1	Finance skills T6.5
9	Problem solving T2.3	Health & Safety T6.1
10	Accountability T3.2	

Table n. 6. Comparison among the results of different surveys and overall ranking of most important soft skills for WBL (source: own elab.)

VET-GPS, 2018	Valorize High Skilled Migrants, 2018	Overall ranking (ESCO skills)
Accountability T3.2	Service skills (understanding of others' needs) T4.1/T4.2	T4.3 Collaborating in teams and networks
Teamwork T4.3	Teamwork T4.3	T4.1 Communicating
Problem solving T2.3	Adaptability and flexibility T3.3	T3.1 Working efficiently
Interpersonal T4.1/T4.3	Motivation T3.2	T3.2 Taking a proactive approach
Initiative T3.2	Time management T3.1	T2.3 Dealing with problems
Communication T4.1	Managing responsibilities T3.2	
Critical thinking T2.1	Personale effectiveness and integrity T3.1	
Learning to learn T3.4	Communication T4.1	
	Learning to learn T3.4	
	Problem solving T2.3	

Soft skills for transnational mobility of learners

3.2

According to INAPP (2019), in the context of apprenticeship, transnational mobility constitutes a highly effective training action to prepare young people for the labour world and to extend their cultural horizons. Thus, this chapter is dedicated to better understand the importance of soft skills within transnational mobility activities.

Mobility experiences abroad effectively contribute to promote the development, not only of technical professional competences, but also of those cross-sectoral skills (another name to call soft skills) increasingly required by employers. The placement in a culturally different relational context indeed allows young people to enhance their social skills playing a crucial role in the right interpretation and use of social interaction rules and allowing to be more effective in personal and professional relations. Moreover, mobility experiences abroad may improve the language skills and, therefore, develop communication and relational skills. Finally, the transnational mobility may facilitate the dialogue between the job sector and training institutions, contributing to enhance the mutual trust and the cooperation with the purpose of improving the quality of the training and learning results.

The responses provided to INAPP by the experts from the Alpine Regions allowed to identify also some of the main obstacles to the transnational mobility of apprentices, that can be easily extended to other forms of Work-Based Learning:

- the limited apprentices' knowledge of foreign languages, particularly in the lowest professional and career levels, given also by the fact that the apprenticeship doesn't always provide for foreign languages teaching. This determines a set of difficulties, not only in placing apprentices in the hosting country's schools and companies, but also, for example, in ensuring that apprentices understand and comply with the rules on safety at work, and are able to

benefit from the training required to develop professional skills;

- apprentices' lack of interest in carrying out training periods in another country, due to language difficulties and problems of adaptation to the new context, as well as to the need of free time in summer, when the stay-abroad is usually provided;

- difficulties in recognising and valuing the skills acquired by apprentices during the mobility periods abroad. The differences of programmes and vocational profiles in terms of knowledge, capabilities and skills required to achieve the qualification or the certificate, do not contribute to the recognition of periods abroad for the achievement of the qualification or certification. Also the general short-term length of the stays abroad makes difficult to appreciate and assess the cross-sectoral skills which may be achieved by apprentices during the mobility periods, even because they are not always easily measurable and verifiable. So the lack of common reference standards for the validation/certification of the skills acquired during the mobility periods determines a lack of the usability value of the skills, and reduces the apprentices' motivation in carrying out a training period abroad.

For these reasons, it seems important to initiate a process of identifying common systems at transnational level for the recognition, definition, observation and evaluation of soft skills that can foster the emergence of the added value of a transnational mobility experience in this field as well. The importance of soft skills in international mobility processes for study purposes is widely recognised and has been the subject of some interesting ERASMUS+ projects that have been identified and analysed.

One of them, ERASMUS Skills, coordinated by the Autonomous University of Madrid (de la Torre et al., 2021), focuses on soft KSAs (Knowledge, Skills, Abilities) related to mobility experiences, with special emphasis on intercultural or global issues, that's to say on the characteristics that Deardorff (2006) describes as individual (see Figure 5), understood as the key ingredients that a student would need to gain and deploy specific competences during its interactions during mobility.

With regard to skills, Deardorff emphasises soft skills such as to listen, observe and evaluate, analytical skills, goal-achievement skills and interpretative skills. The author argues that individuals must demonstrate a set of skills necessary for them to function competently in an intercultural environment.

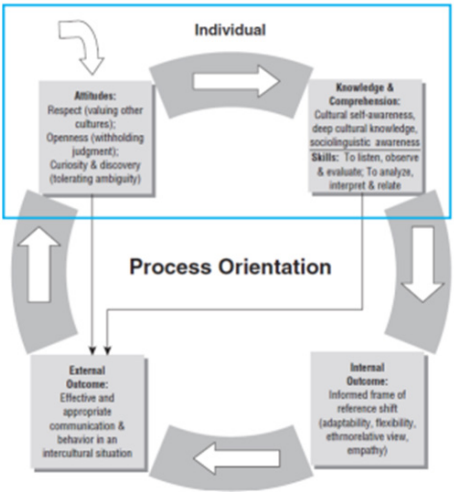


Fig. 5. Process for building intercultural competences and related soft skills (source: de la Torre et al., 2021 from Deardoff, 2006)

Even if targetted on university level international mobility activities, the results from ERASMUS Skills project can be useful also for international mobility at lower learning levels. Quite interesting are the results of a survey on activities or services carried out by universities and other institutions in order to support students developing the above-mentioned KSAs. The survey reported many initiatives in the field of pre mobility language courses, informative meetings prior to mobility, training sessions, workshops or courses addressing mobility-related KSAs.

As for the Skills considered by the collected initiatives (see Fig. n. 6), more than 76% aimed at improving the communication and the adaptability skills of outgoing students, followed by language skills (47.1%) and problem solving (41.2%). These results may entail that, before mobility, the main concern of the respondent institutions is to facilitate students' future adaptation to their host country: they will have to communicate in a different language and context and adapt to a new culture.

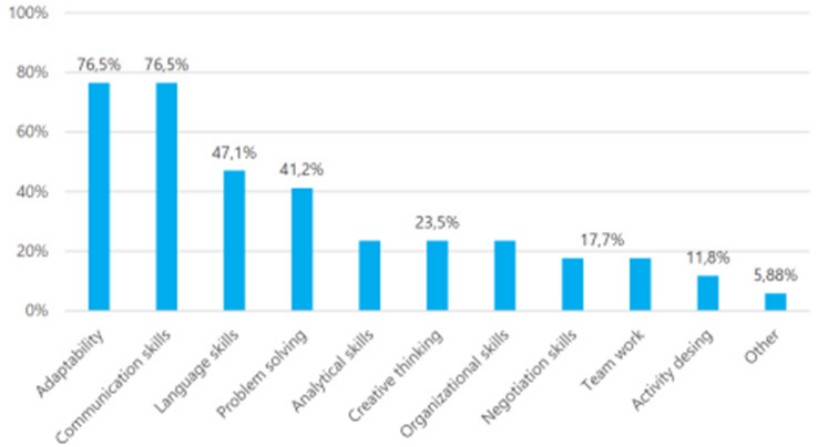
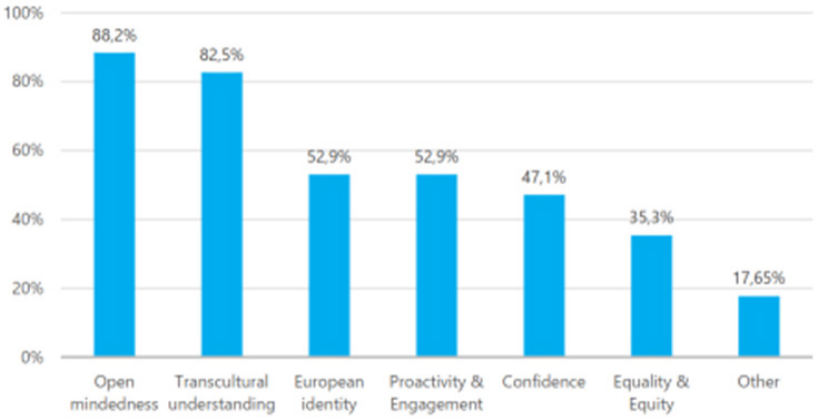


Fig. 6. Skills addressed by the initiatives supporting outgoing students (source: de la Torre, 2021)

According to Fig. 7, the main Attitudes addressed by those initiatives supporting outgoing students are open mindedness (88.2%) and transcultural understanding. These results show again the concern of the respondent institutions about facilitating students' adaptation to the host country: the collected initiatives aim mostly at improving empathic attitudes and mental appraisals that support tolerance and understanding towards foreign cultures.



Skills/Attitudes	Items for self-assessment before/after mobility experience
Analytical skills	- I think logically and draw conclusions; - I am able to gather, analyse and articulate information from different resources in order to solve problems and make decisions; - I am able to synthetize technical information and to provide analysis with a critical point of view.
Problem solving	- I am capable of finding solutions in difficult or challenging contexts; - I am able to use logic and reasoning to identify alternative solutions and approaches to problems; - In my discipline, I am able to handle problems and think in an original or creative way.
Creative thinking	- I am able to think outside of the box to bring new ideas to solve problems or seek solutions to a particular situation; - I know how to develop an idea and put it into practice.
Team work	- I am able to like to work collaboratively in teams; - I can work easily in intercultural groups; - I am able to interact with people who hold different interests, values, or perspectives; - I feel confident in expressing my opinion in a group; - I am able to work together with people from a different scientific discipline.
Organizational skills	- I am able to plan and organize tasks and activities; - I am effective at managing time; - I am capable of setting priorities; - I am capable of keeping deadlines.
Communication skills	- I can express myself creatively; - I feel confident enough to ask for advice from people that I don't know; - I can understand well nonverbal communication and gestures; - I am able to (effectively) communicate my ideas in intercultural social environments; - I feel confident about giving a presentation in a language different from my mother tongue.

Table n.7. Most important soft skills and attitudes engaged in transnational mobility, and possibile items for self-assessment (source: Erasmus skills, n.d.)

Negotiation skills	- When different opinions are arising in a group, I am able to reconcile.
Language skills	- I am able to communicate my ideas and thoughts to people from other cultures; - I can explain clearly to local people of the host country what I need and why I need it; - I do not let my language level hold me back from speaking with people.
Adaptability	- I feel confident in working with intercultural teams; - I feel prepared to enter the labour market.
Open Mindedness	- I try to keep an open mind regarding new challenges; - I am ready to live abroad and learn new things.
Proactivity and Engagement	- I am interested in knowing what happens in the world daily; - I am ready to re-examine the way I think and act.
European identity	- I am interested in European topics (politics, economy, cultural, education etc); - I feel European.
Equality & equity	- I am tolerant towards other persons' values and behavior; - I respect the views and the thoughts of others even if they are significantly different from mine; - I respect and follow the principle of equality in humanity.
Transcultural understanding	- I put effort in meeting new people; - I enjoy meeting and cooperating with people from different cultural background; - I accept that today's globalized societies are characterized by diversity; - I see the value of interacting with different cultures.

The conclusions of the survey offer some interesting general reflections:

- a good practice should combine passive initiatives based on delivering relevant information for the mobility period to students and active initiatives based on training activities and activities for student integration in host university/city/culture;

- the survey couldn't identify any institutional initiative supporting returning students. This gap is aligned with the results of ESN survey (Josek et al., 2016), in which Erasmus students reported the lack of support services after the mobility period, even though several studies show that in many cases coming back to their home country is a difficult time for mobility students. A good practice should provide support to students in this sense, at least in the reinforcement and root of the mobility-related KSAs acquired during the mobility experience based on the results of self-reflection tools (e.g. questionnaires) or activities;

- in this direction *Erasmus skills* project have developed two questionnaires to encourage reflection and awareness of students about their learning process abroad with regards to KSAs, one to be fulfilled before the mobility experience and second one to be fulfilled after mobility, that consider these KSAs: European Identity and Global Citizenship, Cultural knowledge, Social skills, Curiosity/Openness attitudes, Discipline Awareness, Communication in different languages, Adaptability to Change, Teamwork in diverse environment, Planning & Organizing and Creativity.

In summary, Table 7 shows the soft skills and attitudes considered most important for improving the effectiveness of transnational mobility, which were taken as the basis for the development of questionnaires and an app for self-reflection/self-evaluation by students before and after the mobility experience (Erasmus skills, n.d.).

Other useful considerations come from the *Skills* Act 4 VET Erasmus+ project, coordinated by Tribeka Training Lab S.L.U., Malaga (Spain). The project aims to define the five most useful soft skills which are activated during an international work-based experience by students who attend vocational educational training (VET) schools: the project therefore considers both the transnational mobility and work-based learning dimensions, offering interesting insights.

During the first stage of the project a transnational, extensive exploratory research has been made (Skills Act 4 VET, 2020) in order to select and identify five, most important, transversal skills to be considered in the following stages of the project and to describe accurately the content of each transversal skill –

framed within the learning needs of the target students (aged 14-18 enrolled in VET training). The multi-targetted research involved 226 VET teachers, 705 students, 100 SMEs in 11 european countries .

Figure 8 shows the main difficulties encountered by VET students during their transnational mobility experience, as perceived by the students, the VET teachers and the host SMEs. All three groups put the linguistic difficulties first. Another significant hardship, mainly found for students, turns out to be homesickness, included in the cluster of emotional/psychological difficulties.

List of difficulties	students	teachers	companies
Language difficulties	**1**	**1**	**1**
Emotional/psychological difficulties: homesickness	2	7	6
Cultural differences: the way of communicating	**3**	**2**	**2**
Difficulties in traineeship activities: you didn't know how to do something	4	8	3
Cultural differences: different timetable	5	4	5
With other students who shared this experience with them	6	5	10
Cultural differences: the way of working	7	3	4
Cultural differences: personal space	8	9	7
With student's colleagues, supervisor and people who worked with the student at the company	9	5	9
With teachers who accompanied the student	10	15	12
With the company Tutor	11	10	11
Difficulties in moving through the city	12	14	8
With local people	13	11	14
Difficulties in traineeship activities: the tasks were too difficult	14	12	13
Emotional/psychological difficulties: panic attacks	15	13	15

Fig. 8. Difficulties encountered during during the transnational mobility experience in the perception of VET students, teachers and host companies, in order of relevance. In red are highlighted the most important common difficulties (source: Skills Act 4 VET, 2020)

Crossing the survey results on difficulties encountered and the most important and useful soft-skills to have the best learning transnational mobility experience, Skills Act 4 VET team found five dimensions that can be considered the most critical soft skills to prepare for the mobility experience (see Fig. 9).

DIFFICULTIES	SOFT SKILLS	SHORT DESCRIPTION (in the survey)
Language difficulties	CONTEXT READING and ADAPTABILITY	It is the ability to act properly in both new and known contexts, adapting to their specific characteristics and recognising the values, beliefs, resources and limits of the environment and people.
Cultural differences: a way of communicating		It is the ability to recognise yours and other role expectations. In multicultural contexts, this capacity implies the linguistic-communicative adaptation to a specific environment.
Emotional/psychological difficulties: homesickness	SELF CONFIDENCE	Recognising our strengths and weaknesses,
Difficulties in traineeship activities	FOLLOWERSHIP	Supporting your own referent/superior and co-workers at the workplace and to demonstrate collaboration, trust in the group's member and cohesion capabilities
Cultural differences: different timetable	CULTURAL AWARENESS	Respecting and being aware of cultural differences and work effectively with people from a range of social and cultural backgrounds
ALL THE ABOVE	PROACTIVITY	Acting in advance of a future situation, rather than just reacting

Fig. 9. Five most critical soft skills in students mobility experience (Source: Skills Act 4 VET, 2020)

The research team developed also a definition and a list of behavioural indicators for each of the 5 critical soft skills, that can be useful for the development of observation and evaluation methodologies and tools:

1. PROACTIVITY

Definition: Acting in advance of a future situation, rather than just reacting. Ability to seek opportunities, take the lead in improving current circumstances or creating new ones and persevere in bringing significant change. Act of one's own inspiration, perform tasks before they are required, invent new ways of doing things and accomplish different tasks or processes.

Behavioural indicators:

- He/she seeks stimuli, opportunities for improvement;
- He/she often spontaneously proposes ideas, observations, interpretations and solutions, also innovative.;
- He/she acts by involving him/herself and others in extra efforts;
- He/she identifies and utilises social resources;
- He/she uses information, advice, practical assistance and emotional support from others;
- He/she envisions success, anticipating future problems, planning on how to deal with them;
- Initiation, reflection, planning and prevention are all part of their coping strategies .

2. SELF CONFIDENCE

Definition: Individual's trust in his/her own abilities, capacities, and judgments, recognising his/her own strengths and weaknesses, belief that he/she can successfully face day to day challenges and demands

Behavioural indicators:

- He/she reflects on himself and shows awareness of his own emotions;
- He/she possesses a realistic perception of his strengths and weaknesses;
- He/she recognises the impact that behaviours can have on themselves and people;
- He/she is self-directed even in the presence of uncertainties and pressures;
- He/she can cope with different situations and does not give up when difficulties come up;
- Do not generalise defeats and victories, attributing them to the right causes.

3. CULTURAL AWARENESS

Definition: Individual's capability to function and manage effectively in culturally diverse settings.

Behavioural indicators:

- Being motivated to learn about other cultures, knowing Cultural etiquette;
- Interpret someone's unfamiliar and ambiguous gestures the way that person's compatriots would;
- Tease out of a person's or group's behaviour those features that would be true of all people and all groups;
- Don't being afraid of making mistakes (gaffes), overcoming obstacles and setback;
- Ability to mirror the customs and gestures of the people around you;
- Cultural awareness also involves making adjustments and adaptations as necessary in different social and professional situations;
- Do not overkill with sweeping generalisations.

4. FOLLOWERSHIP (including Support the leader, Critical thinking, Autonomy)

Definition: It is the ability to support the boss (or the referent) at the workplace, taking responsibility for the common goal, and actively participating in any task or change needed by the group. It is the ability to demonstrate collaboration, trust in the group's member and cohesion capabilities.

Behavioural indicators:

- Supporting your manager or boss;
- Ability to promote a collaborative and respectful working relationships;
- Being committed to the job;
- Feeling engaged and involved in a team;
- Helping colleagues even if there is no profit for him/her-self;
- Expressing agreement with the group goals;

- Feeling responsible even in challenging situations;
- Supporting colleagues who are going through difficulties;
- Capable of expressing his/her point of view in a positive way avoiding any criticism;
- Like to receive feedbacks and sharing ideas with bosses;
- His/her contributions are considered constructive by the bosses.

5. ADAPTABILITY AND CONTEXT READING

Definition: (Adaptability) It is the ability to act properly in both new and known contexts, adapting to their specific characteristics and recognising the values, beliefs, resources and limits of the environment and people. (Context reading) It is the ability to recognise yours and other role expectations. In multicultural contexts, this capacity implies the linguistic-communicative adaptation to a specific environment

Behavioural indicators:

- Feeling at ease even in new or unknown situations;
- Putting the attention on the relational processes among people;
- Knowing the culture and the communicative styles of the context;
- Capable of understanding formal and informal hierarchical relationships between people in the workplace context;
- Able to recognise the others' expectations;
- Establishing relationships by considering the context features;
- Able to upgrade the skills following the development of the organisation.

Concluding the analysis of the works on the relationship between soft skills and transnational mobility actions, we must first of all point out that in this case the studies analysed do not make it possible to define an order of importance of the soft skills identified that would allow a synthesis expressed in quantitative terms.

However, it appears possible to make a comparison between the strategic soft skills during transnational mobility experiences in order to identify those which are recurrent in the two works (Table 8). Here again, the differences in the definition of soft skills were overcome by resorting to the ESCO classification to which all the soft skills that emerged were referred and which was used to describe the common soft skills identified. Basically, five soft skills emerged from this comparison and should find their place in the preparation of students engaged in transnational mobility experiences, especially those implemented in work-based learning:

- T3.2 Taking a proactive approach;
- T3.3 Maintaining a positive attitude;
- T3.4 Demonstrating willingness to learn;
- T4.3 Collaborating in teams and networks;
- T6.4 Applying cultural skills and competences.

Erasmus skills project	Skills Act 4 VET project	Common soft skills
Analytical skills T2.1	Self Confidence - T3.3	T4.3 Collaborating in teams and networks T6.4 Applying cultural skills and competences (Cultural awareness and transcultural understanding)
Problem solving T2.3	Proactivity – T3.2	T3.2 Taking a proactive approach
Creative thinking T2.4	Cultural awareness - T4.3/T6.4	T3.3 Maintaining a positive attitude
Team work T4.3	Followership – T4.2	T3.4 Demonstrating willingness to learn
Organizational skills T3.1	Adaptability and Context reading – T3.4	
Organizational skills T3.1		
Negotiation skills T4.1		
Language skills T1.1		
Adaptability T3.4		
Open Mindedness T3.4		
Proactivity and Engagement T3.2		
European identity T6.3		
Equality & equity T6.3		
Transcultural under-standing T4.3/T6.4		

Soft skills for the social and economic development of EUSALP macroregion

3.3

Research work concerning the Alpine area cannot refrain from investigating the relationship between the development of certain soft skills and the development of strategic economic sectors for the Alpine area. In this chapter, an attempt will therefore be made to identify which soft skills are most likely to favour the development of the Alpine economy - both in a general sense and in the specific sense of some particularly significant sectors - and in particular to accompany and favour the processes of transformation and innovation that are currently underway or can be expected in the medium term.

An important contribution in this sense is offered by the project Alpjobs - Anticipate Future Jobs on Alpine Remote Areas, financed in the framework of EUSALP. According to it (Scolozzi et al., n.d.), over the next 10- 30 years, the following global megatrends could be considered as relevant for the scenarios affecting EUSALP area and the job opportunities of remote areas:

- **social**: demographic as decreasing population (falling birth rates in western countries but increasing world population), shift from rural to urban areas, shift towards cities, ageing population; increasing differences between generations; migration/immigration; speed in skills mismatching;
- **technological**: hyper-connectivity (i.e. digitisation, access to information), big data, Internet of things (IoT) and Artificial Intelligence, robotics and sharing economy platforms;
- **environmental**: climate change (e.g. possible increase of frequency and occurrence of extreme events); shortage of resources (e.g. water, food, ...);

- **economic**: shifts/reshaping/ of global markets (dependence on emerging markets for economic growth that will outpace and eventually overtake many developed economies); increase of global middle class especially in Asia;

- **political**: multi-polar world (countries will face growing tensions between central and provincial or local authorities).

Translated in local trends for Alpine space (the project considered five local alpine areas from Italy, Slovenia, Austria, Switzerland), the most relevant trends are:

- **social**: population is locally stagnating or slightly declining; in all areas the proportion of young people is clearly declining and the elders are going to reach the proportion 1 out of 3 in the population; cooperation and role of volunteering is sharply declined in some areas; long- and wide life training, education and extension services have the potential to increase the resilience of remote areas through the access to accurate and detailed information allowing citizens and value chain actors to make timely, well informed and effective decisions;

- **technological**: connectivity is lacking in some areas with high agricultural activity; not every community is allowed access to broadband: some hamlets are either cell phone dead zones or with rather slow connection; the more remote areas cannot attract new businesses or reverse slow declining populations if citizens do not have a fast Internet connection; it is difficult to expand tech services, both in-house and to customers;

- **environmental**: most of alpine areas involved in the project have a number of environmental resources such as land used for agriculture and food production, grazing land for animals, forest or woodland, natural areas with native vegetation and animals, freshwater features; all these are working as strengths to enhance tourism activities that are pivotal for local development. Some remote areas have faced unprecedented environmental risks in recent years that are threatening the survival and resilience of the territorial systems; climate change will have a range of impacts on businesses. Even though new business opportunities could arise, most of the impacts are expected to be disrupting for local firms: tourism, property and infrastructure damage leading to increased costs of maintenance and materials and disruption of value chains (i.e., forecasted reductions in snow cover will negatively affect the winter sports value chain in many areas; in case of water resources there will a need of making efforts to ease tensions between different groups of users;

- **economic**: main economic sectors consist of tourism and agriculture or forestry, and associated services; the sector of services is in general the most important in terms of number of employees, the workforce in agriculture and forestry is declining everywhere; tourism based on nature and outdoor activities is commonly dominating the local economy, with structures and tourists on the rise, while the number of overnights is stagnating in some areas and increasing in others; all selected areas have own identity with specific traditional production or natural resources;

- **political**: marginal alpine areas can be considered as the periphery of urban (or more important) areas, with a relevant number of commuters (for study as well as for working); this condition is exacerbated by the centralization and cut (or risk to lose) of public services (e.g. healthcare, childcare, education); EU, national and/or national funds are insufficient in leveraging significant public and private investment to address investment gaps in key sectors of the territorial real economy; as use to land/environmental resources, decision makers are called to manage tensions often made worse by increasing costs of their management.

The sketched scenarios were used as starting points on which outline strategy elements for local development as well as for education and training innovation in the studied areas. The project outlined a set of skill profiles potentially needed in 2030 for the four economic sectors of interest: agri-food and forest, tourism including recreational activities, arts-craft or local manufacturing and services. Particular attention was given to the identification of common skills (Battistel et al. n.d.), generally soft or transversal skills, among different local and sectoral findings, such as:

- ***communication skills***: it means a general recognition of importance of speaking at least two foreign languages. In terms of communication skills, the ideal candidate employee in 2030 should be a proactive communicator, like a "storyteller" of own stories about products and services (possibly using digital communities and social networks for a digital storytelling). These communication skills should include the ability to assist customers or hosts from different cultures (non-European ones increasingly important) and recognize the different needs of people of different ages, in a sort of intercultural and intergenerational competence;

- ***teamworking and organizational/managerial skills***: if nowadays the employee should have a good ability to organize work independently, in the future he/she should be able to organize work activities in groups, perhaps by building remote collaborations, within a strategic and integrated planning.

- ***futures literacy***: the uncertainties and continuous changes require a medium-long term and shared perspective to anticipate risks and create opportunities (futures literacy), in the place of only focusing the current market and trends;

- ***social and environmental sustainability***: integrated planning at the level of a firm or local community would mean looking at social and environmental sustainability and bridging technological innovations to traditional practices as strategic tools, beyond an eco-friendly attitude or "green-washing" of economic processes;

- ***facilitation skills***: the competence for cooperation building between peers and with other sectors, using also digital tools, is considered essential;

- ***exploitation of local cultural, traditional identity***: especially important for remote alpine areas is the ability to renew traditions, for example by combining traditional materials and new technologies and new uses and products. This will require creativity and design skills or ability to collaborate with creative partners;

- ***digital skills***: the considered necessary digital skills for 2030 include two main specific applications: digital marketing and automation of production, functional to service and product personalization.

- ***creativity*** **and** ***intercultural, intergenerational understanding***: creativity will be increasingly important for adaptation to novelties and the unexpected, while intercultural and intergenerational understanding will be increasingly relevant with the aging of the population all over the world;

- ***instructional/mentoring skills***, which mean the ability to instruct persons with lower education in working with automated machines to ensure that their workforce is not lost;

- also, soft skills such as courage, openness, resilience, adaptability and empathy were considered important in a 2030 perspective.

Of course, these general indications must then be adapted to the specific situations of each economic sector, therefore this chapter will consider the relationship between soft skills and certain types of Alpine economic systems, chosen from among the most representative.

A real up-to-date mapping of the socio-economic and environmental systems of the Alpine arc does not exist after the work of Tappeiner et al. (2008) who tried

to define with statistical techniques (cluster analysis) eight regions with different economic and social structures or environmental situations (see Figure 10) that can be summarized as follows:

- 'employment hubs' are municipalities to which many employed persons commute daily. They have a good transport infrastructure and offer a good range of jobs in the secondary and tertiary sectors;
- 'residential municipalities' are typical residential and dormitory municipalities located around major;
- 'employment hubs'. Daily commuting is possible without great loss of time, due to the above-average traffic infrastructure. The residential environment in these municipalities is attractive, and land prices are affordable, which leads to increased urban sprawl;
- 'important tourist centers' have very well-developed accommodation facilities; the employment situation is better than average in the Alps. Most of them are rural municipalities with largely intact agriculture and an attractive landscape;
- 'dynamic rural areas' are characterized by a rural location and a dynamic labor market. The employment of women and older persons in particular has improved significantly here, not least due to the positive development of tourism. Agriculture in these areas is largely intact. Of concern, however, is the above average emigration of employed persons;
- 'standard Alpine regions' reach average values for the Alps in all aspects. Typical of these are low tourism intensity, a negative commuter balance, and a decline in agriculture. Balanced migration and birth rates, however, prevent excessive over-aging in these municipalities;
- 'traditional agricultural regions' are characterized by a severe over-aging of society, poor traffic infrastructure, and a moderate retreat of, mostly extensive, agriculture from the area. The poor employment situation in these regions is likely to contribute to the fact that the number of abandoned farms is limited. Overall, this results in a rich, traditional landscape;
- 'rural retreats' are characterized by good traffic infrastructure, which residents use to commute to work while keeping their center of life in the rural hinterland. Agriculture has largely retreated from the area, creating a slightly fragmented and highly diverse landscape;

- 'forgotten rural areas' are characterized by significant over-aging and a particularly strong abandonment of agriculture. A major reason for this is remoteness and poor traffic infrastructure. The areas show great economic weakness and are threatened by depopulation;

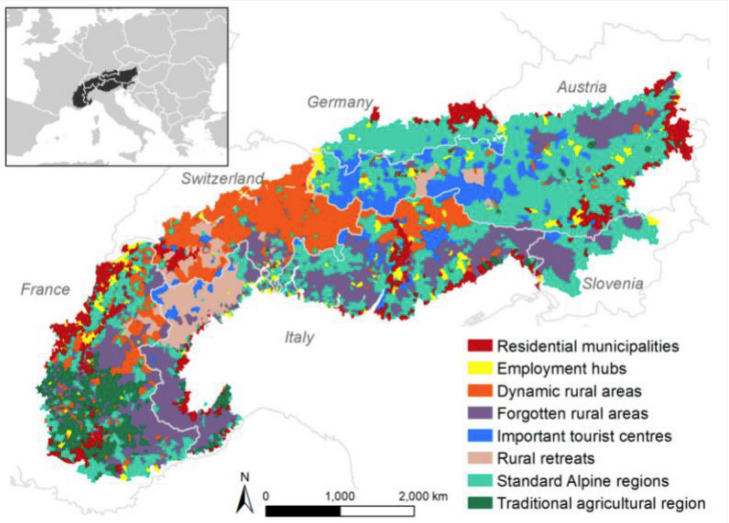


Fig. 10. Location of the European Alps in Europe (small map), and the eight social–ecological regions in the study area (large map), as identified by Tappeiner et al. (2008). (source: Schirpke et al., 2022)

Starting from the 8 regions described above, with reference to the mapping of the most significant soft skills to govern the transformation processes underway, we have identified the following five most interesting socio-economic systems on which to focus our attention, which will be analysed in detail below:

- the economic systems mainly based on tourism activities, both extensive and intensive;
- the economic systems with an integrated traditional economy (integration of agricultural-silvicultural craftmanship activities);
- economic systems mainly based on traditional industrial activities (e.g. engineering) and/or emerging ones (e.g. electronics);

- urban systems based predominantly on service activities;
- economic systems supporting transport-logistics corridors.

Soft skills for the development and innovation of tourism alpine areas

3.3.1

Tourism is an important component of alpine economy, even if specific data are difficult to collect and compare. According to different sources the percentage of jobs in the hotel and restaurant sector of the Alps ranges from 7% to 10-12%, rising at minimum 15% both including jobs directly and indirectly linked to tourism. It isn't evenly spread throughout the Alpine region, but tends to be concentrated in easily accessible valleys and basins: 37% of Alpine municipalities have no tourist beds, while the economy of only 10% of the municipalities, representing 8% of the Alpine population, is based on tourism, and 46% of the beds are concentrated in 5% of the municipalities, according to the WGSTAC (2018).

The success of the Alps as one of the leading destinations in the world tourism market is strongly due to their high diversity. Very different tourism offers cover the demand of several consumer groups with their specific motivations throughout the year. The core reason for this success is the enormous diversity of regional resources and thereby also the cultural heritage of the Alpine region. According to Alpine Convention (2013) there are two different types of tourist systems in the Alps:

- intense or mass tourism systems, which concern the 10% of the municipalities and their territories, that rely heavily on (mostly in winter) tourism, that need to prevent, reduce and/or compensate for the impact generated by tourist infrastructures and make their operation sustainable;
- extensive or soft tourism systems, that concern most of the Alpine areas and their communities and that are, by nature

or by political will, centred around extensive (mostly summer) tourism. In their case, the challenge is to make social and economic development and employment possible at local level.

Although some job profiles are similar between the two types of tourism systems, there are also significant differences, so reflections on tourism will be presented distinctly for the two types.

3.3.1.1 Soft skills for intense tourism systems

According to Vanat (2020) the Alps are by far the largest inbound ski market on the planet, capturing 43% of worldwide attendance. It is also the most intensely equipped region of the industry, totalling more than 10.000 lifts; it is home to 4 of the major players of the ski industry: France, Italy, Switzerland and Austria. The Report explains some important trends and change factors that are influencing snow tourism: already in the early 2010s, the industry became aware that it was still heavily dependent on the baby boomers, expected to retire within 10 next years. Industry made some convenience improvements (e.g. carved ski, lift comfort) and customer loyalty programs were introduced to keep the baby-boomers skiing longer. It was the start of the discounted multi-resorts season passes, which later on turned into the mega-passes (e.g., Dolomiti SuperSki). If customer service was expected to become a driver, much more needs to be done in this direction: apps and e-services are not yet really supported by effective services, and the industry remains in front of the challenge to bring in new customers. The need for a new growth model remains, to renew the baby boomers that are going to retire from the market. Such a model would need to change sociodemographic focus in order to acquiring new skiers from the large population ranges with no skiing tradition. The themes of insufficient growth of the middle class and difficult cultural penetration of the ski are major issues, yet unsettled. The more the new generation get multicultural, the less the penetration of the ski culture. There is a big challenge to change now of paradigm and make the ski urban, for instance promoting the dissemination of revolving carpet simulators, indoor training centres and dry slopes, to contribute bringing ski to the young urban generations.

Consumption patterns are changing, and ski is becoming more considered as a leisure activity than as a sport. Persistence of this trend puts the ski industry at risk, as leisure is much more subject to trends and fashion than sport.

Snow-based tourism, especially alpine ski tourism, was repeatedly identified also as particularly vulnerable to climatic changes. The dependency on climatic

resources is stronger than in any other form of tourism. Snow is an indispensable resource, either natural or technically produced snow: without snow there is no skiing. Climate change, though, isn't the only challenge for the industry, but it will reinforce existing structural problems and thus contribute to the transition of the ski tourism marketplace.

For instance, Steiger & Abegg (2018) have calculated that a warming of 1°C would lead to a reduction of snow reliable ski areas in eastern alpine regions to 91% of the actual number, while a warming of 2°C should reduce the number of snow reliable ski areas to 69 %.

The project ALP.IN.SKI (Alpine Innovation Ski) - Best practices in Alpine ski resorts (ARGE ALP, 2015) testifies to the increasing importance of the sustainability of economic activities taking place in the Alpine arc and in particular those linked to one of its most important economic sectors, i.e., winter tourism. The project has identified a number of priority areas of analysis: energy savings in the use of ski facilities; the use of alternative energy sources for the operation of ski lifts and in the management of snowmaking; cableway transport as an alternative form of mobility; the inclusion of ski lifts in more complex transport systems organised according to sustainable mobility criteria; and the management of fundamental resources such as the landscape and the surrounding environment. In order to preside over these themes and these lines of transformation, a widespread presence among operators, at all levels, of an aptitude for environmental and energy sustainability capable of sustaining diversified technical-professional skills according to professional profile appears fundamental. The prospects for Alpine winter tourism are therefore affected by various change factors and are not easy to determine. The Working group Sustainable tourism of the Alpine Convention (WGSTAC, 2018) identifies two possible scenarios:

- the first perspective, called *development scenario for consolidated destinations*, particularly refers to those tourist destinations, as it is the case with many winter tourist resorts, which are already in their maturity phase – frequently found e.g. in France and Switzerland. In order to offer not only products, but primarily experiences to tourists, this requires not only continuous innovation and technical progress, but it mainly refers to a combination of de-seasonalization, product diversification (e.g., new sports, gastronomy, wellness facilities, shopping, and cultural events), organization and marketing schemes, e.g., through cooperation with less developed destinations nearby. At the same time, these large tourist centres ideally should be restructured from the sociocultural and ecological point of view, through a "re regionalization" process, aiming both at restoring local economies, and avoiding a loss of identity for the site due to the "fake authenticity" that is sometimes offered to visitors. The "quantitative" development phase seems to have

ended: it has to leave room to a "qualitative" one. The current tourist offer should go towards a "premium" dimension - e.g. by increasing and improving the skiing offer through new connections, guaranteeing high quality services and, above all, remembering that ski as a product, by itself is no longer sufficient for sustaining a tourist destination; therefore, a transition from "ski tourism" to "snow tourism" is needed.

- the second perspective, called *development scenario for emerging destinations* –is well suited to those places that are, especially in summer, typically characterized by scarcely mature tourist products, or simply do not have them. This type of scenario should not focus on quantity, but rather on quality – that ideally is an important feature of both scenarios. This choice allows positioning the destinations on the market. in a unique way, being able to attract only one type of guests, who can appreciate, and be willing to safeguard, the context where they spend their holiday. This perspective will be specifically considered in the next chapter.

The analysis of the bibliographic sources did not make it possible to trace any significant works on the subject of human resources employed in Alpine ski resorts and their competences, particularly with regard to the importance of soft skills in their training. It therefore appears necessary to make original considerations starting from the analysis of the transformation processes identified. This makes it possible to highlight the importance of the following soft skills:

- ***digital transversal skills***: the use of digital systems and services in the ski activity has been on the increase in recent years, also as a consequence of the Covid 19 pandemic, which has made it necessary to strengthen all remote services and the application of methods that allow distancing between operators and skiers: management of ski-passes, access systems to ski lifts, booking of ski services (e.g. ski lessons, guided excursions) and non-ski services (equipment hire, catering services, etc.). This requires the widespread presence of digital skills capable of verifying the correct functioning of the various systems, of using them appropriately, of offering support to users in the event of malfunctions (e.g. difficulties in accessing mobile devices to wireless networks), of interacting remotely with experts in the event of malfunctions, going beyond the specific technical-professional digital skills for the development and management of online services, which are not examined in this work;

- ability to ***analyse future scenarios*** of transformation and to foresee change: this is certainly a high-level soft skill, not required for all workers, but certainly strategic in helping local intensive tourism systems to define and implement strategies to adapt to and govern the climatic, demographic,

socio-economic and market changes that will influence the propensity to consume Alpine skiing in the coming decades;

- ability to ***communicate and manage interpersonal relationships***: if skiing is not to be understood as a product but as an experience, the communication and interpersonal skills of all operators become fundamental to guarantee a positive and memorable experience: from the sports instructor to the ski lift and support service operators, to the catering and apres-ski service operators. Consequently, the ability to communicate and tell 'stories' and not just practical and/or technical elements becomes fundamental, as does the ability to interact effectively with the different users of ski services, from the elderly to children, who require different ways of relating;

- aptitude for ***environmental and energy sustainability***: as amply demonstrated by the studies analysed both in this chapter and in the following one, dedicated precisely to sustainable forms of tourism, the issue of environmental and energy sustainability of ski resorts is imposing itself as one of the emerging themes, both to contribute to the general reduction of greenhouse gas emissions, and to contribute to the sustainability policies of Alpine tourist resorts, aimed for example at obtaining various forms of resort or product environmental certification. Again, these are transversal skills that must be possessed by all ski resort workers at different levels, from those involved in ski slope management (e.g. artificial snow production) to those working on the ski lifts. Each worker, within the scope of his or her role and task, must make a contribution to the overall sustainability goals.

3.3.1.2 Soft skills for extensive, sustainable tourism systems

One of the most important transformational trends in the tourism sector is certainly the growth of sustainable tourism. Although there is no single definition, the European Commission defines sustainable tourism as "tourism that is economically and socially viable without detracting from the environment and local culture", which means a balanced approach to the three pillars of sustainability (economic, social and environmental).

As referred by Working group Sustainable tourism of the Alpine Convention (WGSTAC, 2018), today tourist destinations face many challenges, including the shorter stay of guests, late bookings, more demanding visitors showing more individualistic tendencies. All these challenges apply well to Alpine destinations, which have to deal with a greater sensitivity to climate change, as recorded in

recent years. According to Next Tourism Generation Alliance (NTGA, 2019), for the tourism industry the incentive to act in more sustainable ways should perhaps be even stronger than for other industries since so much of tourism is dependent on natural and cultural resources, many of which are being destroyed by unsustainable behaviour of companies and tourists. Tourism today is an important consumer of energy and generator of greenhouse gas emissions. Tourism also contributes to excessive freshwater use (for showers, laundry services, swimming pools, and spas, keeping hotel gardens and golf courses green, production of food for tourists and more), to unsustainable land use and food consumption. On the positive side, tourism can raise awareness of cultural and environmental values, help finance the conservation of landscapes and cultural heritage, rekindle interest in ancient traditions and local cultures and create jobs.

In the perspective of sustainable tourism, also intensive tourist centres like alpine ski resorts ideally should be restructured from the sociocultural and ecological point of view, through a "re-regionalization" process, aiming both at restoring local economies, and avoiding a loss of identity for the site, due to the "fake authenticity" that is sometimes offered to visitors. Locations that have gone through a more intensive path of development can also contribute to sustainability by implementing measures of energy and resource efficiency, dismantling and re-naturalization (WGSTAC, 2018).

But there are many alpine places that are, especially in summer, typically characterized by scarcely mature tourist products. A consistent model of tourist development for this case should promote social- and climate-friendly practices, the so called "soft" or "slow" tourism (e.g. agri-tourism, eco-tourism and low impact tourist mobility): the resulting model of this kind of tourism is niche-focused, based on sustainable mobility, zero-km products, rediscovery of local traditions and culture and it is in contact with uncontaminated nature, where infrastructure is minimal, with no losses in the quality of the offer and services.

Translating these considerations in terms of skill needs is not simple: tourism, as a multi-faceted industry with complex employment patterns and levels, requires a wide range of jobs from senior management and high tech to the provision of basic services. Typically, the employment pyramid in the tourism sector has a broad base with a large number of unskilled and semiskilled employees and many with craft and communication skills but with fewer supervisory and managerial positions. Employees at the lower levels are likely to interact with tourists. Providing them with skills in customer service is vital to the quality of the product offered by tourism businesses. According to NTGA (2019), skills for the future in the tourism and hospitality sector require a higher level of skills development at operational through to senior management and executive level. Importantly, a higher level of qualifications in general will be needed.

Sustainability seems to be an emerging, strategic issue that needs the development of specific skills. For instance, at a managerial/entrepreneurial level, PM4SD (Project Management for Sustainable Development) is a training/certification system developed by APMG International, one of the most important global accreditation and examination institutes, targeted at governments, organizations and individuals operating in the tourism and cultural sectors. The main objectives of the certificate are: understanding the characteristics and context of sustainable tourism development, applying PM4SD methodology principles, roles & components to sustainable development projects; embedding sustainability principles into tourism and development projects and initiatives; securing support and funding for tourism and development projects; adopt a proven and consistent approach to the planning, design and execution of sustainable development & tourism projects. NTGA has identified three important skills sets for future jobs in tourism, and especially in sustainable tourism: digital, green and social-cultural skills:

- ***digital skills***: the ongoing digitization and computerization of the tourism sector will impact many tourisms related jobs in the future. Artificial Intelligence will automate and simplify more and more aspects of the customer journey (booking, ticketing, payments, check-in, information) as well as management processes (via PMS / EPOS and other systems). Low-skilled jobs and repetitive routine tasks are likely to be replaced by AI-powered applications and systems while the complexity of remaining jobs will increase and new jobs will be created, mainly in technical areas. Digital fluency (encompassing all topics DigComp2.0 covers with the addition of more professional digital skills for online marketing, branding and distribution as well for data analytics), will be crucial. Unique, customized and personalized experiences are the future in all tourism sectors: therefore, skills in creating experiences, both in the real world and with the use of augmented and virtual reality, or in mixed reality with special attention to gamification, will be important. But the on-going changes and innovations will make self-learning capacities (permanent education, adaptability, agility, and flexibility) the most important skill for the future in order to cope with digital innovations and disruptive business models;

- ***social and cultural skills***: all along the tourism chain of production it seems to be a future need for pro active, empathic service experts who can gain an in-depth understanding - through online data or otherwise - of their customers to deliver highly personalized services whether they are elderly travellers, passengers with special needs or tourists from non-European countries of origin. These experts need to make sure tourists have a great experience before, during and after their trip and need to be good communicators in several languages. These experts need not only excellent inter-

personal and collaborative skills but also creativity to come up with original, surprising solutions to co-create unique and authentic experiences in collaboration with their customers. Delivering innovative, participatory content requires people with storytelling skills, problem-solving and collaborative competencies as well as those who are not only able to interpret local culture, heritage, history for visitors from different cultures and mentalities but who are able to engage them in emotionally rich experiences. Due to these shifts in trends of visitor expectations and trends, tourism workers in the future need an open attitude and need to respect the diversity of customers (considering ethnicity, age, gender, sexual orientation, religious beliefs and those with special needs). Excellent skills in cross-cultural communication, wide use of different languages, multicultural dexterity will be essential due to increasing numbers of tourists from source markets outside of Europe;

- ***green skills***: the development of sustainable tourism is an urgent issue and sustainability touches upon many different social aspects of tourism. Environmental management skills need to cover the entire range from practical, environmental conservation and natural resource management skills (e.g. minimizing water and energy consumption, reduction and reuse of waste), to skills for developing sustainable tourism policies both in the field of job creation and other benefits for local communities and management of overcrowding and "overtourism". Findings from NTGA report suggest that environmental (green) skills should entail more than just helping to reduce the environmental impacts of tourism, but also create opportunities for better community engagement and manage the impact of tourism on local communities through better destination management. This means that green skills could be divided in:

- ***green skills for reducing the environmental impacts of tourism***: they concern reducing resource consumption, energy efficiency, water, waste management, etc. Reducing environmental impacts places emphasis on daily behaviours of staff and customers (switching off lights, separating waste etc.): while other aspects involve people with technical skills (e.g. for designing and planning low impact buildings, installing solar panels, etc), education for environmental skills in tourism should perhaps be more targeted at knowing what is possible and needed, where to get it and how to use it rather than only the installation of energy saving devices. Technological innovation suggests that green skills and digital skills will merge in the future;

- ***green skills for making other aspects of tourism more sustainable***: developing sustainable forms of tourism in (rural) areas should be considered as an option to diversify local economies, create economic growth and decent jobs for local people. Sustainable practices need to be integrated right from

the start into the economic and socio-cultural environment of local communities through appropriate training and knowledge dissemination. There is emerging evidence on the important role of local tourist guides in providing authentic local experiences, interpreting local heritage, being ambassadors of local products and educating tourists about environmental aspects of tourism. All this involves extensive green skills at different levels, such as: planning for sustainable tourism; dealing with host-guest interactions and communities; cultural awareness; resource management; conservation of nature and culture; fair business practices; achievement of green certification / awards / eco-labels for different tourist operators and/or for touristic localities; consumer awareness and education for sustainability; knowledge of climate change, renewable energy systems, and sustainable materials.

Soft skills for the development and transformation of traditional, integrated alpine economies

3.3.2

For centuries, most Alpine areas were based on a traditional economic model that was integrated between agricultural, livestock farming, silviculture and handicraft activities, which also included integration at the spatial-territorial level (pastoralism in the high mountains; silviculture at medium altitudes; agriculture and handicrafts at the bottom of the valleys) and at the temporal level (e.g. agricultural activities in the summer and silviculture/craft activities in the winter). This model, despite having entered a crisis in the last 50 years for various reasons and having initiated a phase of depopulation that has not yet ended in a large part of the Alps, still remains the basis of many Alpine communities, especially those located in the most peripheral areas. Mountain agriculture, forestry, stone, wood, textile and metal craftsmanship are activities that are still widely present today and subject to transformation processes that are in many ways similar to those underway in the economies of the lowland areas, which will be briefly described in the following chapters.

3.3.2.1 The transformation of Alpine agro-sylvo-pastoral systems

Alpine agro-sylvo-pastoral systems have undergone, starting from the last part of XX century, a strong process of abandonment that mainly affected the Italian and the Slovenian part of the Alps. Despite this decline, agriculture in the Alps remains very dynamic. It continues to play an essential role in the natural and cultural identity of the Alps.

Agriculture maintains close links with other economic activities. According to the Permanent Secretariat of the Alpine Convention (PSAC, 2011) the pluri-activity is very developed in this field: it varies from 55% to 75% of farm households in four analysed sites located in different alpine regions. Agriculture can provide additional income for farmers and provide labour seasonally or permanently to other sectors.

To maintain a dynamic agriculture, alpine farmers have relied on different strategies:

- collective organization for the processing and marketing of products;
- maintenance of local knowledge and production of local products as well as protection by product/regional quality labels; these labels provide better value for farmers and consumers to ensure product quality;
- modernization and expansion of farms to improve working conditions and productivity of the workforce; this is often accompanied by the specialization of farms;
- application of zero food miles strategies, e.g. through the development of direct marketing and agritourism;
- adoption of sustainable, environmentally friendly, certified agricultural practices (e.g. organic farming);
- diversification of services and agricultural productions: clearing and gardening, composting of green wastes, production of renewable energy from wood, etc.;
- birth and growth of a new generation of young farmers (even through the support of specific EU fundings) in rural mountain areas, which are considered as being a fundamental instrument to ensure innovation and the transfer of knowledge in rural mountain areas;

- management of environment or landscape through a contracting with state or local authorities (so called agri-environmental measures);

- participation to the exploitation of local resources and other economic sectors, e.g., instituting partnerships with the tourism sector in order to develop holiday offers involving sports activities, visits to farms, tasting and sale of local products, cultural events.

With regard to alpine Italian agriculture context, Gretter et al. (2019) coined the term new farming to name a new model that encompasses other activities besides the core meaning of agricultural activities, including the transformation of products and the promotion of local natural and cultural resources. New farming can be linked to activities of service such as care, tourism and land maintenance. This broader definition has been created in order to enhance the inclusion of activities with a polyfunctional role occurring in the mountains. The new farmers are capable of bringing into local systems different skills, resources and opportunities that were not present or not properly exploited locally. Some examples are small scale, less intensive activities and address needs coming both from external users (i.e. didactic farms) or from within the community (children and health care) maintaining a bond with agricultural activities. In the concept of new farming, the actions of cooperation and networking are of particular relevance.

These transformations, typical of the Alpine context, are accompanied and integrated with the more general ones that concern agriculture as a whole, which can be summarised as follows: agriculture 4.0: agriculture, which is often regarded as a 'traditionalist' environment with little inclination to change, has in recent years been experimenting with the potential of digital transformation applied to agricultural practices with very positive results. Some of the technologies supporting the transformation of Agriculture 4.0 are:

- Digital agro-meteorology: here we are talking about applications that can be used for integrating information from weather forecasts and the real-time collection and analysis of data from various farm sources (e.g. sensors) into cultivation strategies;

- Big Data applied to agriculture: this is the set of information that can be generated by different tools and that can be useful for making production more efficient. This data can come from heterogeneous sources, such as sensors or computer-based transactions, and be structured or unstructured. The key is always the ability to integrate and analyse them in real time, so as to give reliable results from which value can be extracted or generated;

- Blockchain technologies: these are the technologies of the Distributed Ledger Technology family, i.e., systems that enable full traceability of production, from the field to the table, certifying product requirements in terms of sustainability.

- Precision agriculture (PA): can be considered a branch of agriculture 4.0, and it's focuses on developing and enhancing the tools and processes to most efficiently use resources in crop production and reduce input use (water, fertilizer, seeds, herbicides, and insecticides). PA technologies and equipment such as soil and yield mapping using a GPS, laser land levelers, GPS tractor guidance systems, and variable-rate input application allow farmers to calibrate their operations and achieve new levels of efficiency.

In regard to forestry, PSAC (2011) shows that forests are one of the formative landscape elements in the Alps where almost half of the area (45,5%) is covered by woodland; in the alpine scale, forest areas are greatly increasing. But mountain forests are nowadays under-exploited too, with a general tendency towards ageing which can endanger the planting durability and the soil stability. Barriers and obstacles for better exploitation of the mountain forest include: restricted accessibility, lack of skilled manpower, lack of dynamism at local level, fragmentation of the ownership in private forests, and difficulties concentrating supply in public forests. The need for better cooperation along the supply chain has been recognized in several alpine areas. Forests and the use of wood offer attractive job opportunities for mountain dwellers. The combination with an employment in agriculture or other activities is also possible.

The recent EC Communication EU Forest Strategy for 2030 (EC, 2021) underlines that climate change continues to negatively affect European forests, particularly but not only in areas with mono-specific and even-aged forest stands. Sustainable raw wood and non-wood materials and products are key in the EU's transition to a sustainable climate-neutral economy; respect for circular economy principles is also crucial.

Within the boundaries of sustainable availability and supply of wood, the forest-based sector holds significant economic potential for improving its production of sustainable and legally harvested wood for circular and long-lived materials and products. This requires stimulating the demand in downstream industries and promoting forest management practices, production tools and processes that are better adapted to different future forest resources. Also wood-based bioenergy will also continue to have a role to play in improving the livelihoods of primary producers, namely foresters and farmers, and diversifying forest based economic opportunities in rural areas. According to EC (2011) the increasing mul-

tifunctional role that forests will play in the transition to a sustainable and climate neutral future will require an increased skills

set: among others, experts in enhanced sustainable forest management practices, including adaptive re-and afforestation and restoration, architects, engineers and designers, food experts, data specialists, chemists, ecotourism facilitators.

3.3.2.2 Craft 4.0

The term Craft 4.0 refers to all those craft activities that combine traditional, manual techniques with digital techniques in both production and marketing processes. The effects of this integration can be very different: ranging from the more traditional craftsman who exploits digital marketing to tell his story and his original ways of doing things, to the more innovative ones who renew processes by exploiting new technologies also in the production field, such as 3D printing and additive manufacturing technologies, which are already used in various fields such as watchmaking, eyewear, and giftware.

In this perspective, according to Maffei (2017), product-service development processes are to be considered both analogue and digital and can renew traditional practices and processes thanks to the decrease in the technological scale required for many production tools and/or technologies; the ability to use disintermediated design collaboration processes; the possibility of activating crowdfunding processes for the entrepreneurial launch of products and services; and the opportunity to build an alternative distribution using web platforms and tools to implement one-to-one relationships that enable customised productions of goods with high symbolic-technological-economic value.

If, on the one hand, the figure of the craftsman 4.0 refers to the broader innovative process of Industry 4.0, which will be analysed in the next chapter, on the other hand, we can also identify peculiar characteristics such as: the importance of creative soft-skills and, for certain sectors, also artistic soft-skills; the multi functionality of the craftsman entrepreneur who often, especially in micro-enterprises, concentrates in his person different functions such as those of production manager, sales, etc.

3.3.2.3 Which soft-skills for the transformation of integrated Alpine economic systems

While taking into account that each of the different component sectors of the traditional integrated Alpine production model presents its own ongoing transformation processes, it is possible to identify some common skills needs to which the specific ones of each sector will have to be added. Of great importance are, for example, digital skills, which are necessary not so much and not only to master specific technical-professional digital skills typical of each professional figure, but to be able to govern the digital transformation by assessing one's own personal/company positioning, planning digital development and transition processes (including the related skills), and identifying hardware and software technologies that best meet business needs.

A second common skill that emerges is the ability to work in a team and especially in a network. In fact, it emerges that the success of micro-businesses operating in these sectors (as well as in the extensive tourism described in chapter 3.2) is also linked to the ability to connect in territorial and/or supply chain type networks in order to optimise the value creation chain and to overcome the limitations inherent in very small size.

Another soft skill that emerges strongly is the skill that allows people to better understand the role of the future in what they see and do, or what UNESCO has called Futures literacy. In a social and economic world that is constantly and increasingly rapidly changing, the ability to foresee the future development of a situation becomes an important skill at all professional levels, fundamental at the highest levels of decision making responsibility.

Finally, the ability to operate in an environmentally as well as socially and economically sustainable manner is an important soft skill that must be widely possessed by all those working in the various sectors of a modern integrated local economy.

The transformation processes of industrial activities in the Alpine area

3.3.3

Alpine region has a strong industrial tradition. According to Modica (2019) contemporary industrial geography of the Alps can be outlined (Fig. 11) by comparing the spatial distribution of "traditional" industrial sites with that of light industrial districts and innovation clusters grown up in the last phases of alpine industrialization. Accordingly, four types of industrial regions can be identified:

- old industrial regions, characterized by a high density of industrial sites in traditionally mature and declining sectors (textile industry, former branches of electrometallurgy and electrochemistry, cement industry, etc.) and a substantial lack of more advanced industrial activities in leading sectors;
- industrial-tertiary regions of type 1, characterized by a significant presence of old industrial sites in traditional sectors (in sharp decline) as well as a high density of recently developed light industry clusters related to tertiary (tourism, services, logistics) and quaternary (research and development) -based production cycles;
- industrial-tertiary regions of type 2, characterized by a rather young and dynamic industrial structure mostly developed after the 1960s-1970s (often as side-effect of peri-Alpine metropolisation processes), in which light industrial districts strongly connected to knowledge and innovation hubs largely exceed, by size and regional relevance, the few existing old industrial sites – usually with a good activity ratio;
- rural-industrial regions, characterized by a limited presence of old, heavy industrial sites in predominantly rural contexts.

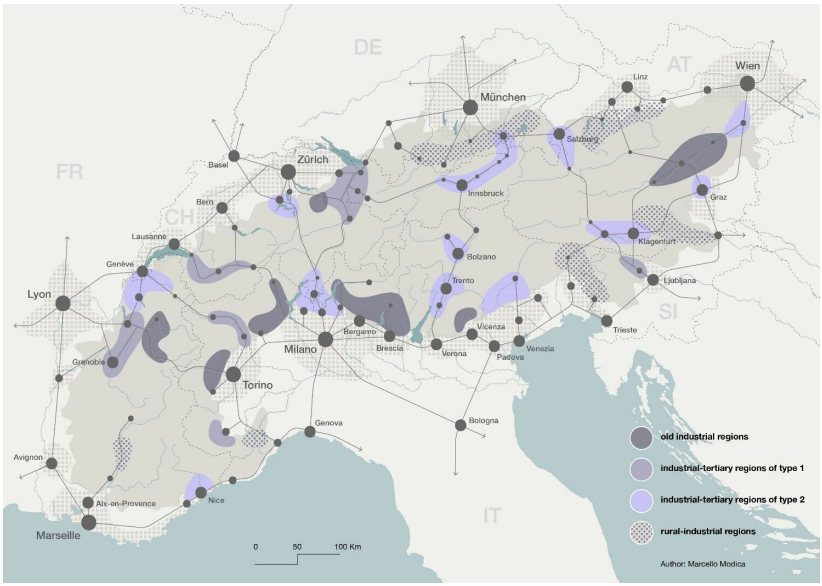


Fig. 11. Typologies of industrial regions in the Alps (source: Modica, 2019)

The Alpine industrial system, regardless of the forms it takes, and the sectors involved, is today facing the challenges posed by the advent of the Industry 4.0 model and its very recent evolution towards the Industry 5.0 concept. The Fourth Industrial Revolution (a.k.a. Industry 4.0, translated from Industrie 4.0 as in German) originated in 2011 from a project in the high-tech strategy of the German government. It advanced the concept of Cyber Physical Systems (CPS) into Cyber Physical Production Systems (CPPS). In the Industry 4.0 era, production systems, in the form of CPPS, can take intelligent decisions through real-time communication and cooperation between "manufacturing things", enabling flexible production of high quality personalized products at mass efficiency, as a result of the application of a set of enabling technologies that, according to a recent literature review (Mubarok, 2020), can be summarized in 12 topics, as shown also in Fig. 12:

- industrial Internet-of-Things;
- the cloud (cloud computing);
- cybersecurity;

- big data and analytics;
- horizontal and vertical system integration;
- advanced robotics,
- additive manufacturing,
- augmented reality,
- artificial intelligence and simulation;
- knowledge graph;
- blockchain;
- digital-twin.

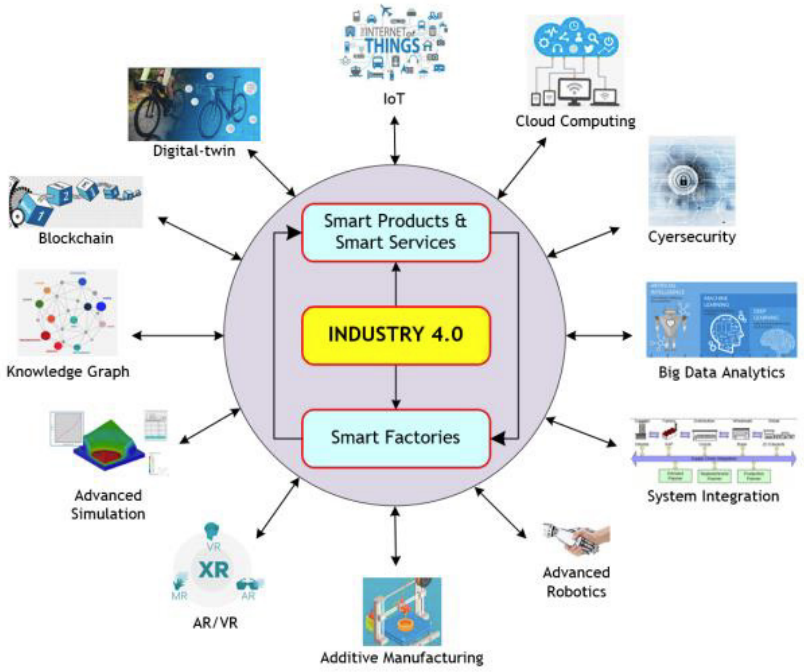


Fig. 12. Advanced technologies driving Industry 4.0 vision (source: Mubarok, 2020)

In 2021, the European Commission (Breque et al., 2021) launched the model of the Fifth Industrial Revolution (Industry 5.0), after discussions amongst participants from research and technology organizations as well as funding agencies across Europe. Industry 5.0 recognizes the power of industry to achieve societal goals beyond jobs and growth, to become a resilient provider of prosperity by making production respect the boundaries of our planet and placing the wellbeing of the industry worker at the center of the production process. Industry 5.0 complements the existing Industry 4.0 paradigm by having research and innovation drive the transition to a sustainable, human-centric and resilient European industry.

According to XU et al. (2021) the human-centric approach, typical of Industry 5.0, puts core human needs and interests at the heart of the production process, shifting from technology-driven progress to a thoroughly human-centric and society-centric approach. As a result, industry workers will develop new roles as a shift of value from considering workers as "cost" to "investment". For the industry to respect planetary boundaries, it needs to be sustainable. It needs to develop circular processes that re-use, repurpose and recycle natural resources, reduce waste and environmental impact, and ultimately lead to a circular economy with better resource efficiency and effectiveness. Resilience refers to the need to develop a higher degree of robustness in industrial production, arming it better against disruptions and ensuring it can provide and support critical infrastructure in times of crisis. (Fig. 13).

Industry 5.0 identified the following six enabling technologies:

- individualized human-machine interaction technologies that interconnect and combine the strengths of humans and machines;
- bio-inspired technologies and smart materials that allow materials with embedded sensors and enhanced features while being recyclable;
- digital twins and simulation to model entire systems;
- Data transmission, storage, and analysis technologies that are able to handle data and system interoperability;
- Artificial Intelligence to detect, for example, causalities in complex, dynamic systems, leading to actionable intelligence;
- Technologies for energy efficiency, renewables, storage and autonomy.

Figure 13. Core values of Industry 5.0 (source: Xu et al. 2021)

If these are the epochal challenges that all industrial systems are and will be called upon to face in the coming years, the role of soft skills in Industry 4.0 and 5.0 has taken on and will take on an increasingly important weight in the professional baggage of workers, at least equal to, if not greater than, that of technical-professional skills. There is a very large bibliography that has investigated the role of soft skills in the new industrial paradigms. A recent master's thesis (Yazgan, 2021) investigated, through a systematic literature review based on 72 papers, mostly edited between 2017 and 2020, which are the future skills driven by Industry 4.0 changes. At the end of the quantitative skills analysis, 35 skills and skills classes were extracted from the sources, ready to go under soft skills and cognitive skills, or hard skills including technological, digital, and IT skills (Fig. 14). As a summary, the rising demand for soft skills is considered inevitable as it is claimed by experts since they are very useful within a wide range of professions in the upcoming digitalization era.

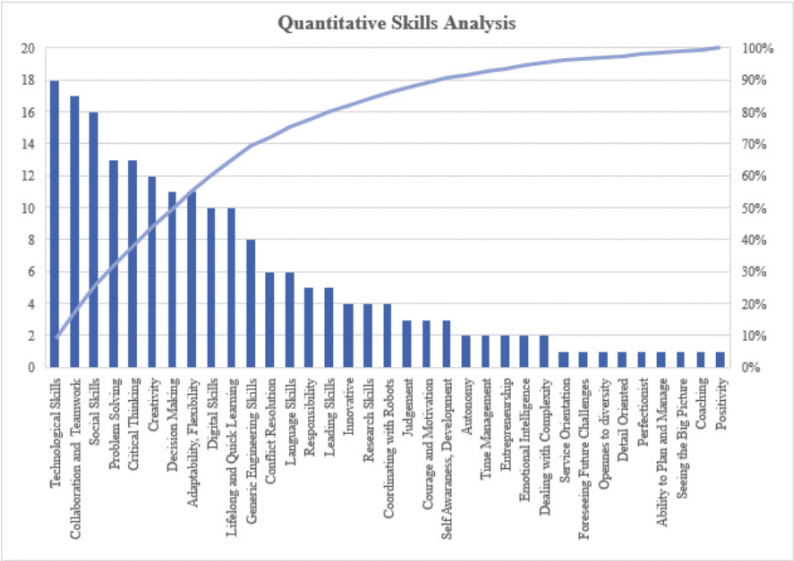


Fig. 14. Soft skills reported in literature review by number of cases (percentage values) (source: Yazgan, 2021)

Hard skills, expressly technological and digital skills, are at the first and the ninth place in the list as hard skills. These skills consist of understanding IT security, programming skills, ICT skills, computer literacy, information technology control, and digital, basic competencies and skills to work with digital and technological devices. Collaboration, teamwork, and the ability to coordinate with others appear as the second important skill group and first important soft skills. Social skills, in third place, may include people skills, relationship skills, listening skills, empathy skills and other skills related to human resources. This emphasis is due to the fact that future workers need to be able to interact with a range of different actors across departments, processes or even supply chains, which includes a variety of stakeholders and even digital actors surrounded by a very diverse, multicultural environment. Therefore, social skills in terms of communication and cooperation are increasingly needed to cope. Cognitive skills, such as problem solving and critical thinking, come after social skills. Future Industry 4.0 workers will need to use their problem-solving skills to deal with problems in the dynamic and uncertain domain surrounded by automation and digitization. In addition to problem-solving ability, another soft and cognitive ability to be mentioned here is creativity. Analyses show that about 70 % of articles mentioning problem-solving ability couple it with creativity.

As dynamism, diversity and uncertainty are the main characteristics of future organizations, cognitive skills such as critical thinking and decision making are becoming the most demanded skills and core competencies that workers at all levels should invest in.

Moreover, flexibility and adaptability can be reconciled with openness to diversity and agility, as they are usually treated together in the articles that address them. Workers in Industry 4.0 are required to make a comprehensive shift from perception to action, from which they can adapt to a new work environment of frequent change and continuous development.

Soft skills for the development of urban systems and services

3.3.4

One particularity of the Alps, as compared with other mountain ranges, is its big population (14.2 million in 2015), which makes it one of the most densely populated mountain ranges in the world. According to Perlik (2019), during the first two decades of the 21st century, the ongoing process of "metropolisation" in the Alpine region has accelerated the polarisation between highly productive, diversified metropolitan areas and specialised mountain regions; today, with Alpine metropolisation, mountain areas are becoming functionally integrated into expanding metropolitan areas as specific parts of metropolitan production systems.

Permanent Secretariat of the Alpine Convention (PSAC, 2018) shows that the Alps are characterised by the proximity of urban and rural areas and the complex relationships between them. The majority of municipalities within the perimeter of the Alpine macro-region are small or very small; indeed, almost 75% have fewer than 2,500 inhabitants, while approximately 11% of Alpine municipalities have more than 5,000 inhabitants. These larger communities are often located in more accessible areas, close to the main transportation axes and in the main valleys (Fig. 15). The most populated municipalities often act as centres of service, commerce and employment, attracting flows of population that commute or move from neighbouring areas.

The transformation of cities, responding to the challenges of urbanization, digitalization and sustainability, can be summarized in one concept: smart cities; but in the Alpine area, due to the prevalence of rural settlements, specularly to smart cities a new concept has been coined: smart villages. These concepts will be analysed in the next chapters in relation to the most relevant soft skills.

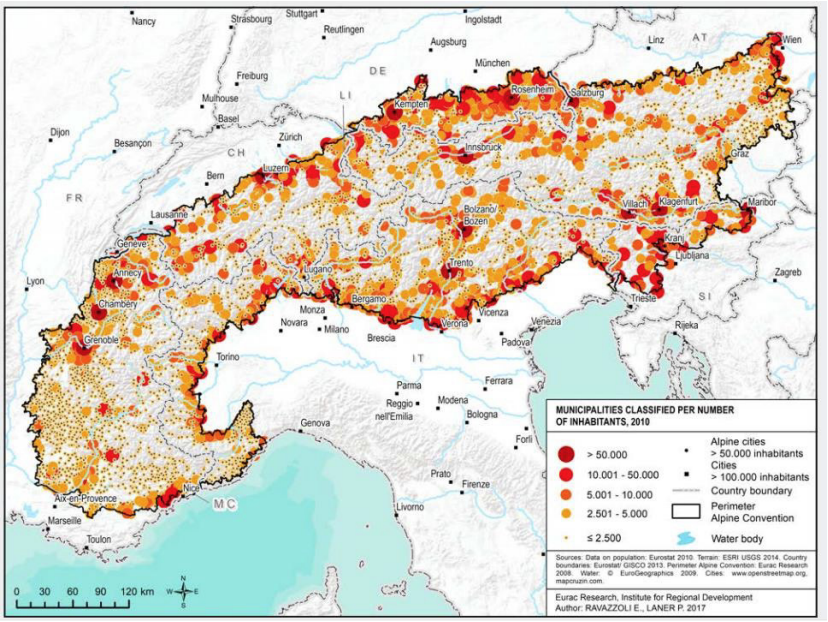


Fig. 15: Alpine municipalities classified by size (source: PSAC, 2018)

3.3.4.1 Soft skills for smart cities

According to Markow et al. (n.d.) smart cities are defined as those that have adopted digital technology into their infrastructure, governance, and workforce, and are home to disruptive innovations and emerging industries. In smart cities, both the public and private sectors leverage data to improve the provision of goods and services. Smart cities strive to enable urban social and economic development and increase economic and governance efficiency through: the intensive use of new technologies in networked infrastructures; a strong entrepreneurial

and business focus; a strong concern for social and environmental sustainability. In systemic terms, smart cities are complex systems that acquire, store and process information aiming to generate economic wealth, as well as well-being for their citizens.

Based on Curseu et al. (2020), ICT literacy is a crucial skill for all who live and work in a smart city. This is because the urban ICT and data infrastructure are not always within reach for all citizens living in smart urban areas (Shelton and Lodato, 2019). Thus, to close the segregation gap created by unequal access to ICT, active support for digital literacy is required from the smart city policy makers.

In order to seize the entrepreneurial opportunities generated by the infusion of technology into the urban space, specialized educational programs could focus on the development of entrepreneurial skills. Moreover, education could play an important role in dealing with some smart city environmental challenges (air pollution, congestion, sustainable living) by raising awareness of these challenges and disseminating effective ways of tackling them at the individual ("green skills") and community level.

Markow et al. (n.d.), through the analysis of online job postings related to a panel of U.S. smart cities, found that despite increased demand for digital skills in smart cities, soft skills are also in stronger demand in these communities. In this field most sought-after soft skills are: communication skills (40% of analysed job postings), collaboration (21%), critical thinking (18%), analytical skills (17%) and creativity (11%). These skills are more commonly demanded in smart cities than in other cities, are growing faster, and are weaving their way into new types of jobs in smart cities.

3.3.4.2 Soft skills for Smart Villages

According to EC "EU Action for Smart Villages" Smart Villages is a relatively new concept within the realm of EU policy making. The emerging concept of Smart Villages refers to rural areas and communities which build on their existing strengths and assets as well as on developing new opportunities. In Smart Villages traditional and new networks and services are enhanced by means of digital, telecommunication technologies, innovations and the better use of knowledge, for the benefit of inhabitants and businesses. Digital technologies and innovations may support quality of life, higher standard of living, public services for citizens, better use of resources, less impact on the environment, and new opportunities for rural value chains in terms of products and improved processes.

Technology is important as are investments in infrastructure, business development, human capital, capacity and community building. Good governance and citizens involvement is also key. A Smart Village would typically pay attention to e-literacy skills, access to e-health and other basic services, innovative solutions for environmental concerns, circular economy application to agricultural waste, promotion of local products supported by technology and ICT, implementing, and taking full benefit of smart specialisation agri food projects, tourism and cultural activities, etc.

Considering the 5-stages model (Fig. 16) for the digital transformation or rural areas proposed by ENRD (n.d.), it is clear the importance not only of digital literacy is but also of team- and networking skills, entrepreneurial skills, communication skills and sustainable development skills.

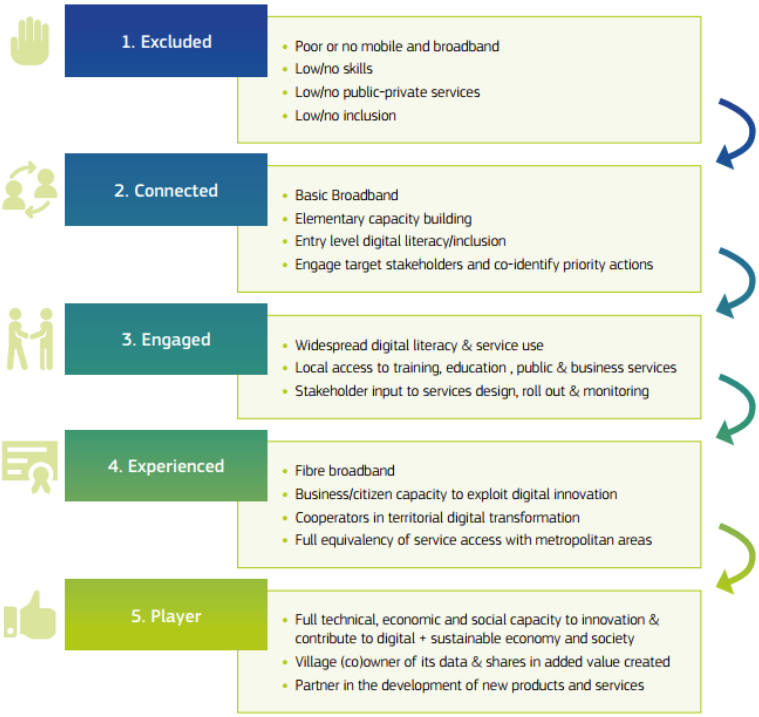


Fig. 16. Key stages in the digital transformation of rural areas (source: ENRD, n.d.).

Soft skills for the development of transport activities

3.3.5

Since the beginnings of human history in the Alps, transport has been a central issue in the histroy and development of this area. For instance, facilitation of transport allowed for a strong development of tourism from the late 19th century and led to a further improvement in the transport infrastructure.

Only a century ago, the introduction of the motor car started to change the situation completely. Especially mass motorisation in the last 70 years and heavy investment in the infrastructure in particular have led to a full integration of the Alpine economies into the European markets, to radical changes in lifestyle, to a decline of Alpine agriculture and to new opportunities for Alpine locations. Directly (construction, transport services) and indirectly (tourism, new industries, trade) transport has led to the creation of new economic activities.

Changes in transport infrastructure and technology have always had a complex impact on local and overall development, creating new opportunities and new imbalances. The strong impact on the environment, e.g., is a rather new problem that acquired a new dimension with widespread motorised transport and the corresponding massive infrastructure.

On a global level DHL (n.d.) reveals that the defining business trend of recent years has been the emergence of a new generation of giant technology platforms which can count their users in the billions. The big players are also continually evolving their operating models, in some cases vertically integrating their logistics operations. And the emergence of a new generation of third-party vendor (3PV) solutions makes it much easier for even small organizations to add sophisticated e-commerce offerings to their existing business models, for example. Away from the interface between companies and their customers, technology is also disrupting the business of logistics. Many start-ups are working to develop new products, services, and business models in the logistics space. Innovation in logistics covers a broad range of technologies and activities, with four areas attracting particular interest and investment: big data

and advanced analytics; artificial intelligence; robotics and automation, Internet of Things.

Sustainability is and will remain high on the agenda for supply chain professionals. Ecological imbalances and growing demand from customers and governments for sustainable solutions have cultivated an urgent need for environment-friendly practices in supply chains, from raw material extraction to managing product end of life. Together with optimized processes, zero-emission mobility, and carbon offset solutions for facilities, this momentum will help the logistics industry go green.

Looking at the most important change drivers for the future in transportation and logistics, disruption is the key-word also according to KPMG (2021). In the future, supply chains won't be driven by products and processes, but by customer needs; they won't depend on capital-intensive fixed assets and linear flows, but on an ecosystem of modular capabilities, delivered through a network of trusted third-parties, that can be scaled and recombined as needed; operators will become managers; new skills will be required and new job roles created. The distinctions between traditional front, middle and back-office functions are blurring as supply chain now reaches into marketing on the one hand and customer service on the other. Tomorrow's supply chains will be more fluid and collaborative, comprising myriad 'as-a-service' partnerships across functions and workforces, decentralized micro supply chains and even parallel supply networks segmented for different customers and markets.

Traditionally, the supply chain literature has been geared towards hard skills including functional and technical skill sets with limited discussion of soft skills. But recent studies support the fact that future supply chain skills will need to include soft skills to supplement hard skills. Bak et al. (2019) found that the changing supply chain scope encourages the requisition and development of different supply chain soft skills, with emphasis placed on behavioural, decision making and management skills as critical. Specifically, behavioural skills such as communication, planning, people management, teamworking, management of complexity and change, time management and negotiation were seen to be more important when compared to others such as decision-making and management skills.

According to BLS (n.d.) most important soft and transversal skills for logisticians are:

- **communication skills**: logisticians need strong communication skills to collaborate with colleagues and do business with suppliers and customers;

- **critical-thinking skills**. Logisticians must develop, adjust, and carry out logistical plans. They often must find ways to reduce costs and improve efficiency;
- **customer service skills**. Logisticians must know the needs of their customers in order to coordinate the movement of materials between suppliers and customers. They gain this knowledge through listening to the customer and applying their knowledge of the products and systems to provide what is required;
- **organizational skills**. Logisticians must be able to keep detailed records and simultaneously manage several projects in a fast-paced environment;
- **problem-solving skills**. Logisticians must handle unforeseen issues, such as delivery problems, and adjust plans as needed to resolve the issues.

Furthermore, the fundamental role of basic digital skills and the ability to manage supply chain processes in a sustainable way should not be forgotten.

Soft skills for the development of alpine economy: final considerations

3.3.6

In chapter 3 we tried to identify the soft skills that are most important for Alpine socio-economic development, with specific reference to some particularly significant sectors such as tourism, crafts, agriculture, industry, urban services and transport. In this final section, an attempt will be made to summarise the considerations that have emerged from the various sectoral analyses, in order to identify a set of soft skills common to most of the sectors, which can be subjected to more careful consideration in the following chapters. Table 9 below offers a summary of the analyses conducted in the previous chapters, identifying, for each sector examined, the transformation processes in progress or foreseen, the risks to which the Alpine area is exposed and the possible development opportunities.

The analysis of the main soft skills that emerged from the bibliography survey made it possible to identify a set of soft skills common to most of the sectors considered:

- basic digital skills are a key component emerging from virtually all the sectors analysed;
- green skills related to sustainability are also a common element in most of the sectors considered;
- skills related to critical thinking and futures literacy emerge particularly in the sectors subject to greater disruptive innovation conditions;
- skills related to teamworking and networking were highlighted as important in many sectors, particularly where there is a need to network with other players;
- the capacity for cultural expression and the valorisation of the cultural heritage of the Alpine area represents a skill that is not homogeneously felt in the various sectors but is very strong in some of them (e.g. tourism, crafts); finally, the development of entrepreneurial skills emerges as an important resource to allow the Alpine area, characterised for the most part by small or very small enterprises, to ride the socio-economic transformation processes, under way in many sectors, without suffering them passively. In order to express and compare the level of importance of the soft skills described above, a panel of 8 experts - belonging to the bodies involved in the realisation of the report (IRES FVG and Fondazione Demarchi) and to the working group that followed the AG 3 EUSALP in carrying out the work - was asked to express an evaluation of the level of importance (expressed on a scale from 0 - not at all important to 3 - fundamental) of each skill identified in the six economic systems analysed.

Table 10 shows the summary of this consultation:

- in first place are green skills related to environmental sustainability, with a score of 2.3/3 and a value above 2 in all economic systems surveyed. The highest values are found for extensive tourism systems (2.6) and urban systems (2.4). The skill is specifically referred to in skill ESCO T6.2 Applying environmental skills and competences;
- in second place we find two competences with equal merit, with a value of 1.9: teamworking, corresponding to the ESCO skill T4.3 Collaborating in teams and networks, which obtains the highest values in relation to tourism

and industrial activities; the competence related to change management (the so-called futures literacy), which also obtains the highest values of importance in relation to tourism and industrial activities; since it is not yet mapped in the ESCO 1 System. 1, this skill is linked to T2.4 Thinking creatively and innovatively, including futures literacy among the narrower skills;

- in third place come interpersonal and communication skills, corresponding to the ESCO skill T4.1 Communicating; in this case the highest value is achieved with reference to extensive tourism activities;

- in fourth place come in a tie (average value of 1.7): digital skills, corresponding to skill ESCO T1.3 Working with digital devices and applications, with particularly high values in relation to industrial and urban systems; entrepreneurial and intrapreneurial skills, corresponding to skill ESCO T6.5 Applying entrepreneurial and financial skills and competences, which are important above all for extensive tourism and traditional integrated economic systems, characterised by the presence of micro-enterprises; finally, in last place is the cultural skill, corresponding to the ESCO skill T6.4 Applying cultural skills and competences, which presents an average value of 1.4, rising to values higher than 2 only for extensive tourist systems and for those with a traditional agro-silvo-craft economy, thus demonstrating a significant but strongly sectoral importance.

Economic systems	Transformation processes
Local systems with intensive, predominantly winter tourism	- climate change; - changes in consumption patterns (skiing from sport to leisure activities); - digitalisation of sports services (apps, e-services).
Local extensive/sustainable tourism systems (sustainable tourism, ecotourism, slow tourism, etc.)	- climate change; - changes in consumption patterns (experiential and sustainable tourism); - digitisation of tourism services; sustainability.
Local systems with an integrated traditional economy (agro-silvo-industrial)	- climate change; - sustainability; - multifunctionality; - digitisation.
Traditional (e.g. metalworking) and emerging (e.g. electronics) industrial systems	- digitalisation - Industry 4.0; - environmental and social sustainability - Industry 5.0.
Urban Systems	- digitisation (e-services); - gridification; - territorialisation of services in low-density areas (proximity services).
Transport-logistics support systems (corridors)	- sustainable mobility; - digitalization: Logistics 4.0 (e-market, platforms, apps).

Table 9. Summary of the main transformation processes in the Alpine economy (source: own elaboration).

Risks	Opportunities
- rising snow depth (rising temperatures); - generational change (baby boomers' retirement); - crisis of the ski-centric model.	- new, less snow-dependent consumption models (e.g. wellness, apres-ski services, actions to attract multicultural and urban 'make the ski urban' generations); - reorganisation according to sustainability criteria:
- fragmentation and isolation; - inability to grasp new patterns of tourism consumption; - lack of entrepreneurial skills.	- developing networks at business and local community level (e.g. UN Global Sustainable Tourism Council certification); - enhancing local intangible heritage; - sustainable, zero-impact tourism systems.
- ageing business models; - lack of entrepreneurial skills; - lack of cross-sectoral integration.	- craftsmanship 4.0; - multifunctional farm; - smart farming.
- ageing business models; - inability to understand and apply new digital technologies.	- dematerialisation of industrial processes; - additive manufacturing; - less importance of economies of scale.
- ageing business models; - inability to network services and settlement systems.	- smart cities; - smart villages; - sustainable cities; - integrated (multifunctional) services.
- bridging effect; - ageing business models.	- advanced services for intermodal corridors; - development opportunities for start-ups providing new digital-intensive services.

Alpine Skills/ Economic Systems	Local systems with intensive, prevalently winter tourism	Local systems with extensive tourism (ecotourism, slow tourism, etc.)	Local systems with an integrated traditional economy (agro-silvo-industrial)
Digital skills T1.3	1,0	1,4	1,6
Change management (futures literacy) T2.4	2,1	2,3	1,5
Interpersonal and communication skills T4.1	1,9	2,5	1,4
Attitudes to environmental sustainability (including energy issues) T6.2	2,0	2,6	2,1
Teamworking/ Networking T4.3	2,3	2,1	1,8
Cultural identity T6.4	1,4	2,4	2,1
Entrepreneurship & Intrapreneurship T6.5	1,9	2,1	2,1

Table 10. Evaluation of the level of importance of a set of soft skills for the different socio-economic systems in the Alpine area (value scale from 0 to 3) (source: own elaboration)

Traditional (e.g. metalworking) and emerging (e.g. electronics) industrial systems	Urban Systems	Transport-logistic support systems (corridors)	Overall average
2,3	2,1	2,0	1,7
2,0	2,0	1,4	1,9
1,5	1,8	1,5	1,8
2,1	2,4	2,3	2,3
2,0	2,0	1,4	1,9
0,8	1,4	0,6	1,4
1,6	1,0	1,4	1,7

Summary of the most important soft skills for work-based learning, transnational mobility and the Alpine economy

3.4

In the previous chapters, the relationships between the development of soft skills and work-based learning experiences, transnational learner mobility, as well as the role soft skills can play in the development of the Alpine economy were all investigated. It emerged strongly that soft skills play an increasingly fundamental role in fostering the learning processes of professional technical competences and the development of professional profiles at all levels, with an increasing emphasis as the levels of responsibility and autonomy grow: with reference to the European Qualification Framework and its 8 levels, it can be stated that soft skills begin to become significant from EQF level 3, becoming more and more important in subsequent levels. In view of the importance of the work-based learning context in the work and priorities of the AG3 EUSALP, it was considered that the most coherent EQF levels for the present study are those ranging from level 3 to level 5, to which the main training experiences and methodologies that refer to work-based learning, such as apprenticeship, internship, long internship, school-to-work alternance, can be referred.

Table 11 below shows the learning outcomes descriptors defining levels 3-4-5 in the EQF (2017 revision).

Descriptors	Knowledge	Skills	Responsibility and authonomy
General meaning	In the context of the EQF, knowledge is described as theoretical and/or factual.	In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments).	In the context of the EQF, responsibility and autonomy is described as the ability of the learner to apply knowledge and skills autonomously and with responsibility.
Level 3	Knowledge of facts, principles, processes and general concepts in a field of work or study.	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information.	Take responsibility for completion of tasks in work or study. Adapt own behaviour to circumstances in solving problems.
Level 4	Factual and theoretical knowledge in broad contexts within a field of work or study.	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study.	Exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change. Supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities.
Level 5	Comprehensive, specialised, factual and theoretical knowledge within a field of work or study, and an awareness of the boundaries of that knowledge.	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems.	Exercise management and supervision in contexts of work or study activities where there is unpredictable change. Review and develop performance of self and others.

Table 11. Description of learning outcomes defining levels 3-4-5 in the EQF (source: European Commission, 2018)

The aim of this chapter is to define a set of soft skills particularly significant for the Alpine context and for work-based learning, on which to focus in the following chapters the analysis of existing systems and tools for the evaluation and possible validation of soft skills and the collection of good practices in the EUSALP area.

The results of this synthesis work were shared with the AG 3 EUSALP working group that followed the development of the survey.

Table 12 below summarises the results obtained from the analysis of the most significant soft skills for the contexts of work-based learning (the first five were considered - see chapter 3.1), transnational mobility of learners (chapter 3.2) and development of the Alpine economy (again the first five were considered - see chapter 3.3), expressed with reference to the ESCO 1.1 classification.

Work-based learning	Transnational mobility	Alpine economy
T4.3 Collaborating in teams and networks	T4.3 Collaborating in teams and networks	T6.2 Applying environmental skills and competences
T4.1 Communicating	T6.4 Applying cultural skills and competences	T4.3 Collaborating in teams and networks
T3.1 Working efficiently	T3.2 Taking a proactive approach	T2.4 Thinking creatively and innovatively (including futures literacy)
T3.2 Taking a proactive approach	T3.3 Maintaining a positive attitude	T4.1 Communicating
T2.3 Dealing with problems		T1.3 Working with digital devices and applications

Table 12. Summary framework of most significant soft skills emerging from literature review (souce: own elaboration)

Some soft skills are recurring in more than one context of analysis and therefore stand as candidates for inclusion among the most significant soft skills:

- T4.3 Collaborating in teams and networks, present in all three fields;
- T4.1 Communicating, present in two out of three areas;

- T3.2 Taking a proactive approach, also present in two out of three areas.

- The other soft skills characterise only one of the contexts of analysis. Taking into account also the presence of European frameworks for the assessment of skills, which can facilitate in-depth work, it was decided to add the following four to the three soft skills indicated above:

- T1.3 Working with digital devices and applications, considering the increasing pervasiveness of IT technologies in every profession, at any level, which requires the development of adequate basic digital skills in all young people entering the labour market;

- T2.4 Thinking creatively and innovatively (including futures literacy), also in this taking into account the continuous and profound processes of change taking place in all economic sectors and professional profiles in the Alpine economy, which increasingly require the ability to foresee future scenarios and to meet the challenges they pose by developing innovative and creative solutions;

- T3.3 Maintaining a positive attitude, taking into account the importance of being able to handle stress, uncertainty and frustration and instead developing a positive attitude towards work;

- T6.2 Applying environmental skills and competences, consider the growing importance of the sustainable development model in all sectors of the Alpine economy, which requires the existence of a basic green culture extended to all workers. As previously noted, the current name of T6.2 skill is not fully convincing and should be changed to a more comprehensive T6.2 Applying core skills and competences for the green transition.

Altogether, these are seven soft skills that will be given priority in the activities of analysing evaluation systems and collecting and studying good practices. This obviously does not mean that they should be the only soft skills targeted by the learning pathways: they are simply a set of skills considered particularly important for fostering the learning processes of technical-professional competences, to which other soft skills can be added that may be of significant value for specific economic sectors or professional profiles. The extended description of the seven selected soft skills, with reference to the ESCO 1.1 classification and European reference frameworks for their assessment, is given in Table 13 below.

Name of transversal skill/ competence	Description
T1.3 Working with digital devices and applications	Carry out simple digital tasks like operating already configured hardware, finding information via web searches, using standard software for communicating or collaborating with others or for creating and editing simple content and choosing between standard measures for protecting devices, personal data and privacy in digital environments.
T2.4 Thinking creatively and innovatively (including futures literacy, not considered in ESCO 1.1)	Generate new ideas or combine existing ones to develop innovative, novel solutions.
T3.2 Taking a proactive approach	Accept responsibilities for managing activities and adopt a forward-looking approach to anticipate problems but also identify opportunities.
T3.3 Maintaining a positive attitude	Withstand adversity, demonstrate resilience and find ways to resolve or manage the effects of difficult life events.

Table 13. Description of selected soft skills (source: own elaboration from ESCO 1.1)

Narrower skills/competences	European reference framework for assessment
- Apply basic programming skills - Apply digital security measures - Conduct web searches - Create digital content - Manage digital identity - Operate digital hardware - Use communication and collaboration software	- DigComp
- Improvise - Think creatively - Think innovatively - Futures literacy	- EntreComp - GreenComp
- Assume responsibility - Make decisions - Manage personal progression - Show commitment - Show determination - Show initiative	- LifeComp - EntreComp
- Approach challenges positively - Cope with stress - Cope with uncertainty - Manage frustration - Show confidence	- LifeComp - EntreComp

Name of transversal skill/ competence	Description
T4.1 Communicating	Express and exchange information, ideas, concepts, thoughts, and feelings, and resolve disagreements in formal and informal contexts, through the use of shared systems of words, signs, and rules.
T4.3 Collaborating in teams and networks (including intercultural competence)	Support or develop a group to work towards a common goal in a way which shows understanding and respect of others' roles and competencies.
T6.2 Applying environmental skills and competences (new proposed name: T6.2 Applying core skills and competences for the green transition)	Reflect on the short and long-term impact of individual behaviours on the physical and social environment and adopt a sustainable work and lifestyle. Recognize the individual and collective responsibility for the protection and restoration of the local and global environment and inspire others.

Narrower skills/competences	European reference framework for assessment
- Address an audience - Moderate a discussion - Negotiate compromises - Promote ideas, products, services - Report facts - Resolve conflicts	- LifeComp
- Build networks - Demonstrate intercultural competence - Work in teams	- EntreComp - INCA Skill
- Adopt ways to foster biodiversity and animal welfare - Adopt ways to reduce negative impact of consumption - Adopt ways to reduce pollution - Engage others in environment friendly behaviours - Evaluate environmental impact of personal behaviour	- GreenComp

4.0 European assessment reference frameworks for selected soft skills

Soft skills assessment: an overview of different methodologies

4.1

Teaching and assessment of soft skills is fundamentally different from traditional teaching and assessment in technical, professional subjects, and, as a result, VET and education systems may face certain obstacles in assessment that are unique to specific soft skills. According to literature, it is important to think in terms of a new soft skills paradigm (Duart, 2020):

- soft skills can be considered integrated with hard skills and can be taught together with them;
- the context plays an important role for soft skills and can't be separated from it;
- soft skills involve several actors: teachers, classmates, employers.... a true dialogue between them is needed;
- a precise measurement for soft skills is often impossible;
- to effective soft skills teaching we need to update didactics and teaching and learning methodologies.

The assessment of soft skills, that are employability skills, requires a wide range of procedures to measure and regards two different contexts: the learning and the working environment. We must also consider that assessment strategies and tools can differ on varying of different soft skills or of different intended learning outcomes of teaching activities (Manasia & Dima, n.d.).

For instance, learning outcomes linked to oral communication, teamwork or leadership can only be assessed in activities where these skills are put into action (oral presentations, teamwork, etc.), while learning outcomes linked to complex cognitive competences, such as problem solving, can be assessed by problem examinations (problem sets), although this could also be done with a thesis, a project or a laboratory work).

There is a multitude of assessment strategies: some of them have been in practice for a long time, others are more recent (see Fig. 16). Their suitability will depend on the coherence between what is to be evaluated and how it is evaluated.

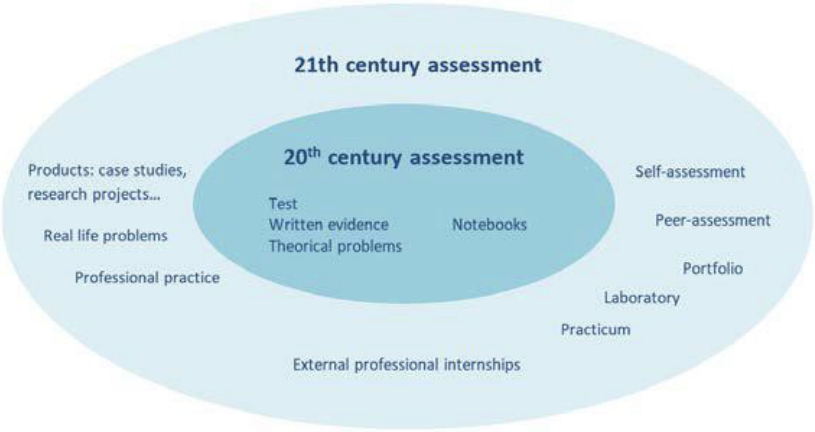


Figure 16: Traditional assessment and performance assessment (source: Manasia & Dima, n.d.)

Despite the acknowledged importance of soft skills, they are still rarely explicitly encouraged in school and university curricula and even more rarely formally assessed. At a time when the detection and the assessment of soft skills takes on a certification function, it is necessary to have instruments for third party detection, assessment and certification of soft skills.

Fig. 17 shows an overall framework of different methodologies that can be adopted for the assessment of soft skills, distinguishing direct and indirect assessment strategies and the more traditional methodologies from the more innovative ones.

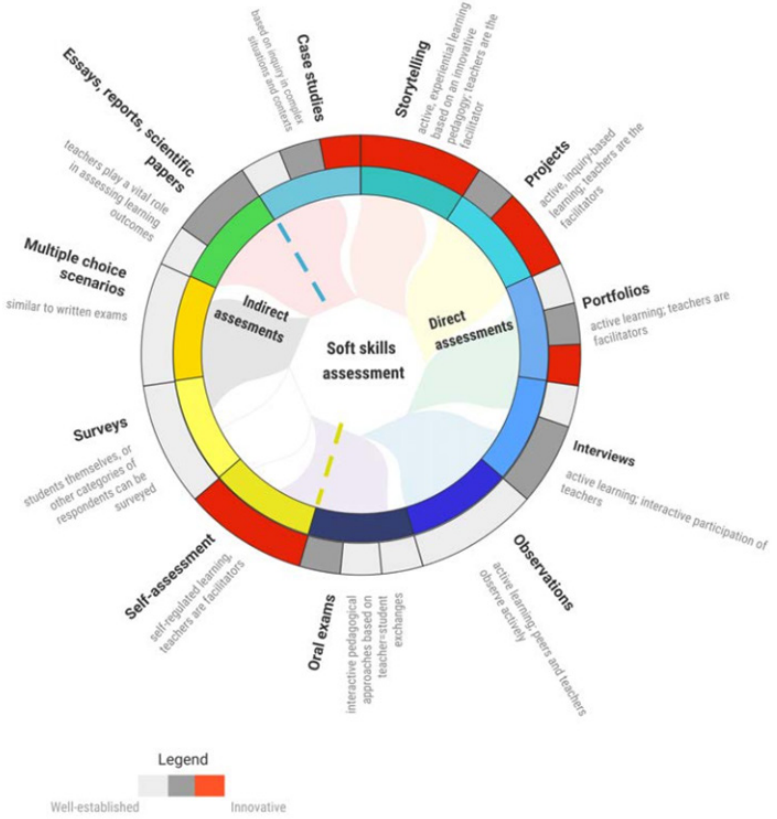


Fig. 17. Clusters of soft skills assessment methodologies (source: Manasia & Dima, n.d.)

The following Table 14 presents the most significant ways in which different methodologies can be used in the soft skills assessment, with a brief presentation of each method, the actors involved, advantages and disadvantages of each methodology. It is based on own elaboration mainly from Manasia & Dima (n.d.). and ATS2020 (2015), to which we refer for further details.

Description of methods of evaluation	Actors involved
Self-Assessment	
It's a key instrument to scaffold self-regulated learning. The term has been used to describe a diverse range of activities (i.e. brainstorming, matrix ranking, card sorting, elevator pitches, small group discussion, case analysis). Taken together, these activities include self-assessment of one's abilities, processes and products for both summative and formative purposes.	- Learners/students - Teachers (can facilitate self-assessment through a variety of techniques and tools) - Potential Employer / HR Manager / Company tutor
Portfolio	
It's an assessment methodology that can be very useful to evaluate different soft skills. Four portfolio types can be used to assess soft skills: - the dossier portfolio: is a record of achievement or a mandated collection of work for selection or promotional purposes required for entry to a profession or programme; - the personal development portfolio is a personal evaluation and reflective account of professional growth during a long-term process; - the training portfolio is a required or mandated exhibit of efforts collected during learning or in a curriculum programme; - the reflective portfolio is a purposeful and personally collected array of work providing evidence of growth and accomplishments for promotion and admission.	-Learners/students - Teacher/s - Potential Employer / HR Manager / Company tutor

Advantages	Disadvantages
- The method generates feedback that fosters learning and genuinely boosts performance. Generates added value where is room for adjustments and improvements - Encourages students to critically reflect their own learning progress and performance - Encourages students to be more responsible for their own learning - Helps students develop their judgmental skills - There is no peer pressure when students evaluate themselves - Helps students become autonomous learners - Helps students be more aware of their weakness and strength	- Self assessment can be subjective because students may not be sincere and may even over-evaluate their own performance - Time consuming for students - Students may not be familiar with the assessment criteria - Teachers and Employers may not be familiar with the assessment criteria
- Portfolio assessment (P.A.) allows the student to continuously self-evaluate, periodically reflecting on his/her past work and thinking critically as to meet future goals - P.A. provides genuine and varied samples of a student's work. The performance is measured through work across a period, rather than on a given day, providing flexibility in how different students accomplish their learning goals - P.A. involves the student as well as his/her teacher and peers. This may include peer evaluation, tutoring, cooperative learning groups and peer conferencing. These coop. measures often help students establish healthy confidence in themselves and their communities - P.A. combines structure and flexibility. The flexibility allows students with different learning styles to be measured fairly thanks to the inclusion of multiple materials. Teachers and students share the responsibility for collecting and responding to the data, teaching students, valuable skills, such as evaluation and organization	- Portfolio assessment is subjective, especially in the absence of some sort of rubric - Portfolios require time to plan and develop. Teachers and employers set guidelines for what they want to see and how students or employees should present the portfolio - Each portfolio is unique, and that uniqueness is both an advantage and a disadvantage. A portfolio is not a standardized test and should not be treated as such

Description of methods of evaluation	Actors involved
Multiple Choice Scenarios	
It's an assessment methodology that presents a question and ask students to choose from a list of possible options/ answers. Most multiple-choice questions feature one correct answer, and two to four "distractor" choices that are incorrect. Questions can take the form of incomplete sentences, statements, or complex scenarios. This methodology has a formative role, in addition to providing evaluative information about a student.	- Learners/students - Teachers
Interviews, Storytelling, Presentations	
Provide creative and flexible approaches where students/ employers co-create authentic learning experiences. The use of interactive teaching and learning techniques, especially through rich digital media, such as interviews, storytelling, and presentations, enable students to actively participate in their education and connect with information in a way that traditional methods of learning simply cannot. They are specially suited for project- and problem-based learning	- Learners/students - Teachers - Potential Employer / HR Manager / Company tutor

Advantages	Disadvantages
- The Multiple Choice questions are the more versatile of the closed-ended question types - This versatility stems from the fact that the questions can contain more elaborate scenarios that require careful consideration on the part of the student - The items can be charts, graphs, text, examples or case studies - They are easy to review and you can provide student with a quick feedback - It reinforces selective thinking - It allows a wide range of content to be assessed - It allows a high reliability and validity	- When compared to true/false and matching, multiple-choice items can be more challenging to write - They also require the creation of plausible "distractors" or incorrect answer options - As with other closed-ended questions, multiple-choice assesses recognition over recall. - Usually involves testing low level of knowledge
- These methods create a space of encounter and sharing where not only the content is important but also the human interaction - Foster authentic learning and deep learning strategies - These methods are mutually beneficial both for learners and teachers (and employers/ company tutors), enabling narrative learning and contributing to technical and soft skills development alike	- Certain skills may be needed to be probed and verified - It could be difficult to collect all the necessary data, and analysis of such data will take time since they are less specific and cover more areas and aspects of the subject - These methods could be highly time consuming

Description of methods of evaluation	Actors involved
Observation	
It's commonly used as a method to support understanding and development. It is one of common way of getting information which can help make sense of educational situations, gauge the effectiveness of educational and human resources management practices, and plan attempts for improvements. The importance of observation for the assessment of the soft skills of employees is crucial during the interview aimed at hiring someone or during a conversation.	- Learners/students - Teacher/s - Potential Employer / HR Manager / Company tutor
Peer Assessment	
It's commonly used as a method to support understanding and development. It requires students to provide either feedback or grades (or both) to their peers on a product or a performance. It is an important complement to self-assessment and really valuable, as the students are more likely to accept feedback from their peers rather than from their teachers, while the language used is expected to be better understood.	- Learners/students - Teachers
Questionnaire	
It's an assessment methodology that could be defined as a specific set of written questions that aims to extract specific information from the chosen respondents. The questions and answers are designed in order to gather information about attitudes, preferences, and factual information of respondents.	- Learners/students - Teachers

Advantages	Disadvantages
- Observation is an easy method since it usually does not require technical skills - Provide high accuracy since the observer directly interacts with the observed - It is a universal and standard method that is used all over the world. It describes the phenomenon exactly as it occurs - In the observation method the very minimum cooperation of the respondent is required	- In the observation method not everything is observed. Feelings, emotions and opinions remain unobserved. - Observation is a costly method since it requires a lot of things. - Observation is a very time-consuming process, and there are chances that the observer and the observed will lose interest in it after a certain point in time.
- Peer assessment pushes students to take responsibility and get them involved in the learning process - It enhances the groups' members work and skills, if used in group work - It focuses on developing judging skills of students. - It provides new type of feedback where is it considered fair by many students due to their trust of other colleagues. - It pushes the evaluated student to take his work seriously as it is going to be evaluated by his peers.	- Peer pressure and friendship may affect the reliability of grades given by students - Students may have a tendency to award everyone the same grade - Students are not experienced in assessing each other and additional time in explaining the criteria may increase the workload of teaching staff.
- It is possible to provide questionnaires to large numbers of people simultaneously - Each respondent receives the identical set of questions (uniformity) - It offers an overall measure of the attitudes and opinions of the respondent - It addresses a large number of issues and questions together, with the possibility of a high response rate	- If not properly designed, it can be misleading - It is hard to follow up on answers, to have interactions with respondents. - It can guarantee lower quality of data, compared to interviews.

Description of methods of evaluation	Actors involved
Assignment – project	
Assignment is a piece of academic or operational work or task. It provides an opportunity for students to learn, practice and demonstrate they have achieved the learning goals. It provides evidence for the teacher that the students have achieved the goals. The output can be judged using sensory perception (observing, reading, tasting, etc.); it can focus on a product as output (e.g. research report, design, prototype, etc.) and/or process (e.g. research process, group process) and/or the performance of individual skills or competences (e.g. professional skills, communications skills). A group (team) project is a study method when project development is based on group (team) work. Group members have clear tasks, are divided into activities and roles, consult with each other, and consult with the teacher/tutor if necessary.	- Learners/students - Teacher/s - Potential Employer / HR Manager / Company tutor
Case study	
It's a real problem presented in a form of a story (narrative), which (depending on the level of complexity of the case) students must identify, analyse on the basis of quantitative and qualitative data, provide alternative solutions and finally reasonably choose the most appropriate solution. Cases are possible in several types: finite fact-based cases, unfinished open-ended cases, fictitious, teacher-created cases, original documentary cases (article, Tv report, etc.). Case analysis can be combined with other methods: discussion, group (team) project, individual project, group work, blog writing, etc.	- Learners/students - Teacher/s - Potential Employer / HR Manager / Company tutor

Advantages	Disadvantages
- Learners/students - Teacher/s - Potential Employer / HR Manager / Company tutor	- It is time consuming and burden process - Careful analysis and correction is necessary otherwise entire works go waste - Teacher has to collect the information from various sources before assigning the work to the students.
- This method can be used in various ways in an educational environment - Case study interviews are widely used in labour market for assessing important soft skills (i.e. problem solving, communication, creativity, team working, …)	- It can be very time consuming - Case study method may have errors of memory or judgment

Reference frameworks for the assessment of selected soft skills

4.2

This chapter will present some reference frameworks, with a European dimension, available to VET system operators for the definition of objectives and learning outcomes, as well as for the evaluation of results, of learning pathways related to the seven soft skills identified in chapter 3 above. The identification of the presented resources took place through a desk analysis of the existing literature, giving priority to the verification of the presence of reference frameworks at a European level for their added value and for their ability to act as an institutional reference above national regulatory and cultural frameworks that could make transnational cooperation more difficult. The attempt to link ESCOs to European reference frameworks represents an innovative aspect of this work and a contribution to the concrete use of such tools.

4.2.1 Description of the European reference frameworks used

In order to overcome the terminological and methodological inhomogeneity of the different sources considered for each soft skill, reference was firstly made to the ESCO 1.1 Transversal skills subpillar system for the definition of soft skills and for the identification of the internal components of these soft skills (the so called narrower skills or sub-skills), which allow us to go into greater training detail.

Subsequently, the different European reference frameworks available (DigComp, EntreComp, LifeComp, GreenComp) were examined in order to verify the possibility of cross-referencing the ESCO soft skills (and the related narrower skills if possible/significant) with the competences present in the frameworks, thus providing further useful elements to define a common framework for the evaluation of these soft skills.

Since the way in which soft skills are presented within the different European reference frameworks varies significantly, a preliminary presentation of the reference model for each framework seems appropriate before moving on to the exposition of the resources available for each ESCO soft skill examined, in chapter 4.3.

4.2.1.1 DigComp

The Digital Competence Framework for Citizens, also known as DigComp, provides a common language to identify and describe the key areas of digital competence. It is an EU-wide tool to improve citizens' digital competence, help policy-makers formulate policies that support digital competence building, and plan education and training initiatives to improve the digital competence of specific target groups. This report referred to version 2.2 of the Digital Competence Framework for Citizens, recently published (Vourikari et al., 2022), which consists of an update of the examples of knowledge, skills and attitudes.

The Digital Competence Framework for Citizens is structured in five dimensions:

- dimension 1 refers to the competence areas: in DigComp 2.2, 5 competence areas outline what the digital competence entails. They are the following: Information and data literacy; Communication and collaboration; Digital content creation; Safety; and Problem solving;

- dimension 2 refers to the competence descriptors and titles that are pertinent to each area: altogether there are 21 competences. Dimension 1 and 2 make up the DigComp conceptual reference model (see Fig. 18);

- dimension 3 of the framework reflects proficiency levels of each competence illustrating the progression in the acquisition of the competence. Currently there are 8 proficiency levels (see fig. 19); the progression of competence acquisition is outlined in three different areas: the complexity of the tasks, the autonomy and guidance need for accomplishing it, and the cognitive domain indicated by the use of action verbs following the Bloom's taxonomy. The eight proficiency levels are inspired by the structure and vocabulary of the European Qualification Framework (EQF), however with no link to the qualifications or education and training systems. For the purposes of this work, it is considered that the most relevant levels are the ones from 3 to 5;

- dimension 4 of the framework refers to examples of the knowledge, skills and attitudes applicable to each competence. It's based on the KSA model, applied also in the EQF system. Especially skills and attitudes can be useful for assessment purpose;

- dimension 5 offers examples of use on the applicability of competence for different purposes.

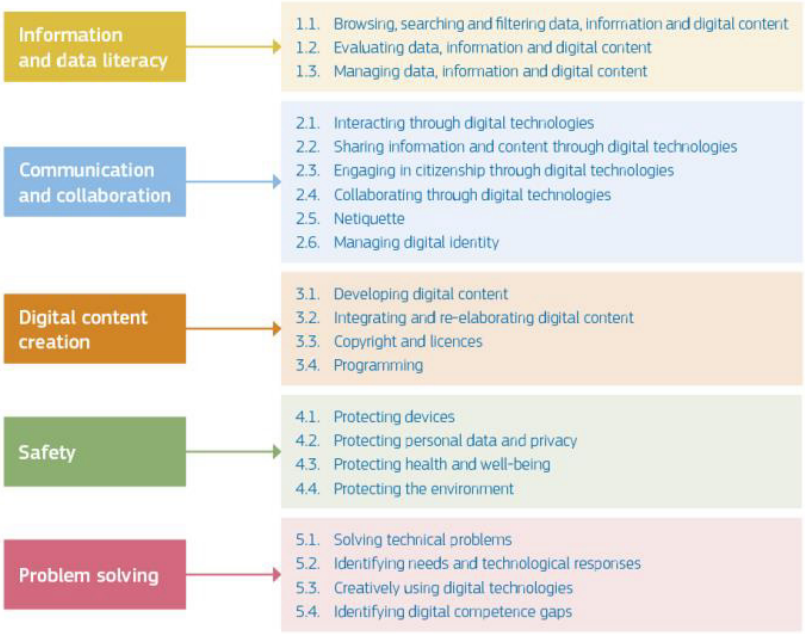


Fig. 18. The DigComp conceptual reference model – dimensions 1 and 2 (source: Vourikari et al., 2022)

4 OVERALL LEVELS	Foundation		Intermediate		Advanced		Highly specialised	
8 GRANULAR LEVELS	1	2	3	4	5	6	7	8
COMPLEXITY OF TASKS	Simple task	Simple task	Well-defined and routine tasks, and straightforward problems	Tasks, and well-defined and non-routine problems	Different tasks and problems	Most appropriate tasks	Resolve complex problems with limited solutions	Resolve complex problems with many interacting factors
AUTONOMY	With guidance	Autonomy and with guidance when needed	On my own	Independent and according to my needs	Guiding others	Able to adapt to others in a complex context	Integrate to contribute to the professional practice and to guide others	Propose new ideas and processes to the field
COGNITIVE DOMAIN	Remembering	Remembering	Understanding	Understanding	Applying	Evaluating	Creating	Creating

Fig. 19. Main keywords that feature the proficiency levels– dimension 3 of DigComp (source: Vourikari et al., 2022)

DigComp obviously does not consider e-skills at a specialised technical-professional level; for these it is necessary to refer to another European reference framework, namely the e-Competence Framework (e-CF), the common European Framework for ICT Professionals in all industry sectors. DigComp, on the other hand, describes the basic competences that should be possessed, at varying levels of autonomy and complexity, by all citizens of the European Union, in particular by all those entering the world of work.

The framework can be used by a range of individuals and organisations to assess digital competences. EU citizens with poor digital skills can use it to identify the knowledge they need to become more active in society. Someone who is unemployed and looking for work can use DigComp to identify the digital skills they already have and add that information to their CV and job applications. In addition, the framework can help them to identify the skills they lack, making it easier to search for the right development and learning opportunities.

Employers searching for new members of staff can use DigComp to define precisely the competences and qualifications that are required to draw up a job description or fill a vacancy. Employment services can use the framework to exchange relevant labour market information — such as CVs and vacancies — and to offer informed career guidance to jobseekers for all jobs that require digital skills but which are not ICT professions.

DigComp is also a guide to learning requirements, which means it is also a valuable resource for the education and training sector. For example, teachers can use it to develop courses and to assess the progress of students as they work to improve their digital competences. Teachers and trainers also need to be digitally competent: they should refer to Digital Competence Framework for Educators (DigCompEdu). DigCompEdu is a scientifically sound framework describing what it means for educators to be digitally competent. It provides a general reference frame to support the development of educator-specific digital competences in

Europe. DigCompEdu is directed towards educators at all levels of education, from early childhood to higher and adult education, including general and vocational education and training, special needs education, and non-formal , learning contexts.

Organizations and bodies working in the education and training sector should refer to the European Framework for Digitally Competent Educational Organisations – DigCompOrg, which can be used by educational organisations (i.e., primary, secondary and VET schools, as well as higher education institutions) to guide a process of self-reflection on their progress towards comprehensive integration and effective deployment of digital learning technologies.

ESCO takes into consideration only a part of the competences defined in DigComp 2.2, those considered fundamental for a basic digital culture: in the next chapter 4.3 these skills will be taken into consideration, cross-referencing them with those in DigComp 2.2 and referring to proficiency levels 3, 4 and 5. The indications concerning knowledge, skills and attitudes (KSA), using which it is possible to construct observation grids or evaluation tests, will be reported, and some indications will be given concerning the way in which these competences can be evaluated.

4.2.1.2 EntreComp

EntreComp: the European Entrepreneurship Competence Framework is a reference framework, launched in 2016, to explain what is meant by an entrepreneurial mindset. It offers a comprehensive description of the knowledge, skills and attitudes (KSA model) that people need to be entrepreneurial and create financial, cultural or social value for others.

Even if entrepreneurial competences in a general sense were not included in the set of soft skills considered most significant for the EUSALP and WBL context, some of the specific competences described in EntreComp are strongly correlated to the soft skills considered in this work (e.g. Creativity, Vision, Motivation and perseverance, etc.); the use of the skills described in EntreComp can therefore constitute an added value as it also results, transversally, in the development of an entrepreneurial orientation and mentality aimed at the concept of value creation.

The conceptual reference model of EntreComp has many similarities with DigComp. EntreComp identifies three Areas of Competence; each of them contains 5 competences, and together these make up the 15 competences that create an entrepreneurial mindset (the EntreComp Wheel - see Fig. 20).

Each competence is explained through a hint and a brief description, and then developed further into thematic threads and learning outcomes. Threads describe what the particular competence really means in practical terms; these threads are the building blocks of each competence. Each thread has associated learning outcomes across 8 progression levels (comparable with the proficiency levels of DigComp), from foundation to intermediate, advanced and expert levels (see page 20). This sense of progression is important when considering the development of a learner over time, the different starting points of learners or exploring to create a coherent entrepreneurship education pathway. The progression model illustrates the connection between the learning outcomes and the increasing level of autonomy of the learner.

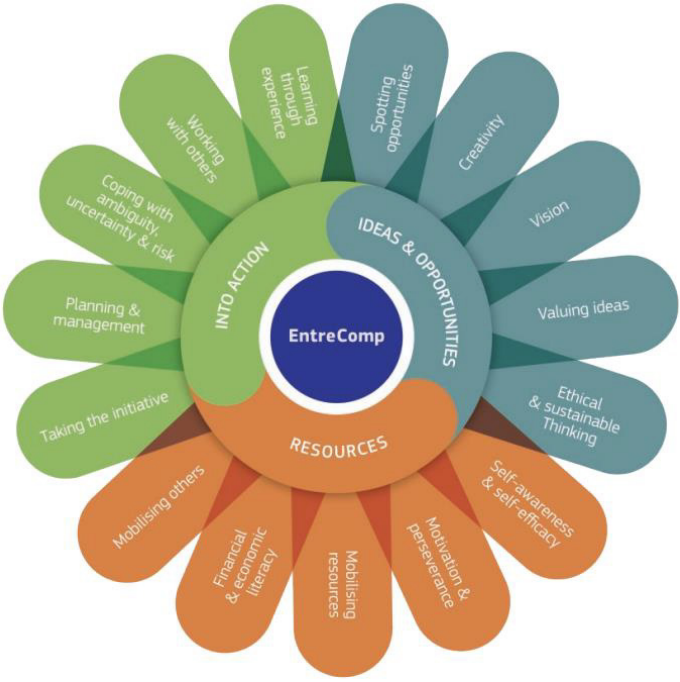


Fig. 20. The EntreComp wheel: 3 competence areas and 15 competences (source: McCallum et al., 2018)

4.2.1.3 GreeComp

GreenComp (Bianchi et al., 2022) is the European reference framework for sustainability competences. It provides a common ground to learners and guidance to educators, advancing a consensual definition of what sustainability as a competence entails.

It responds to the growing need for people to improve and develop the knowledge, skills and attitudes to live, work and act in a sustainable manner. It is designed to support education and training programmes for lifelong learning. It is written for all learners, irrespective of their age and their education level and in any learning setting – formal, non-formal and informal.

Sustainability competences can help learners become systemic and critical thinkers, as well as develop agency, and form a knowledge basis for everyone who cares about our planet's present and future state. The aim of GreenComp is to foster a sustainability mindset by helping users develop the knowledge, skills and attitudes to think, plan and act with empathy, responsibility, and care for our planet.

It provides a general reference model that everyone involved in lifelong learning can use to design learning opportunities aimed at developing sustainability competences and to assess progress in supporting education and training for sustainability.

GreenComp consists of 12 competences organised into four areas (see Table 2). Each competence is described using the KSA model (knowledge, skill and attitude statements), but there isn't any proficiency or progression levels description.

4.2.1.4 LifeComp

LifeComp framework (Sala et al., 2020) regards "Personal, Social and Learning to Learn" skills as a set of competences applying to all spheres of life that can be acquired through formal informal and non-formal education, and can help citizens to thrive in the 21st Century.

LifeComp is made up of three intertwined competence areas: 'Personal', 'Social', and 'Learning to Learn'. Each area includes three competences: Self-regulation, Flexibility, Wellbeing (Personal Area), Empathy, Communication, Collaboration

(Social Area), Growth mindset, Critical thinking, and Managing learning (Learning to learn Area). Each competence has, in turn, three descriptors which generally correspond to the 'awareness, understanding, action' model. These are not to be understood as a hierarchy of different levels of relevance, whereby some are pre-requisites for others. Rather, all of them are to be considered complementary and necessary. There isn't KSA or proficiency levels description.

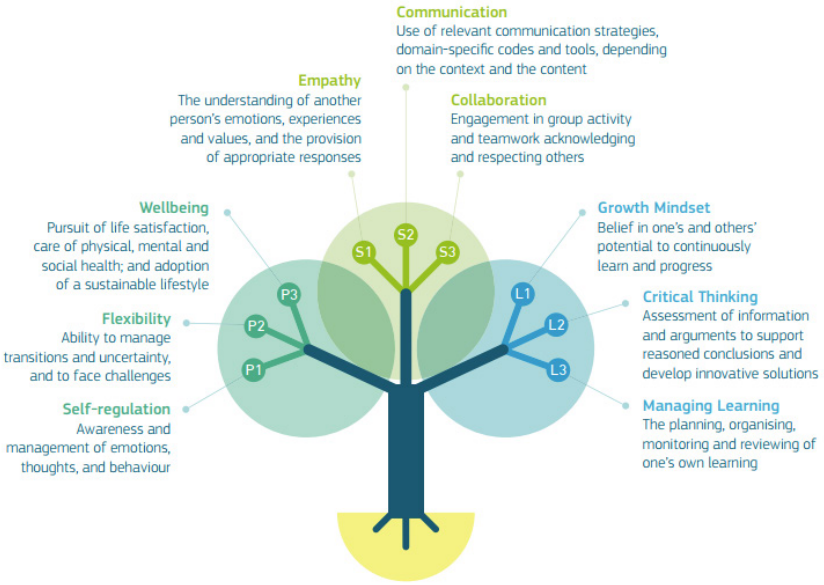


Fig. 21. LifeComp at a glance (source: Sala et al., 2020)

Resources available for the assessment of selected soft skills set

4.3

This chapter will present, in the form of tables, the resources available in the European frameworks described above - with the sole exception of the subskill *Demonstrate intercultural competence* for which, in view of its importance and the lack of a specific reference in the four European frameworks analysed, reference has been made to the Leonardo da Vinci INCA project (2004), which proposed a rubric for the evaluation of this competence - also indicated by the European Commission (https://ec.europa.eu/migrant-integration/library-document/inca-project-intercultural-competence-assessment_en) - for the recognition, description and evaluation of the seven skills selected.

The tables are organised according to a common scheme, albeit adapted to the information available in each framework. The common scheme is as follows:

- name and description of the ESCO soft skill considered;
- identification of the narrower skills and corresponding competence in the identified European framework;
- description of proficiency/progression levels, if any (levels 3 to 5 were considered - for intercultural competence, basic and intermediate levels were considered);
- description of threads *(EntreComp)*, descriptors *(LifeComp)*, knowledge, skills and attitudes *(DigComp* and *GreenComp)* depending on the framework used;
- description of the recommended evaluation methodologies (with reference to the methodologies described in chapter 4.1);
- description of any additional resources available for assessment and/or recognition of the competence considered.

Examples of existing rubrics and syllabuses have been reported; in the field of certifications, those that require the attendance of ad hoc courses to be paid for or, in any case, high costs to obtain certification have not been considered.

ESCO T1.3 WORKING WITH DIGITAL DEVICES AND APPLICATIONS

Carry out simple digital tasks like operating already configured hardware, finding information via web searches, using standard software for communicating or collaborating with others or for creating and editing simple content and choosing between standard measures for protectinwg devices, personal data and privacy in digital environment

ESCO SUB-SKILL: **Apply basic programming skills**			**DIGCOMP 2.2 Skill: 3.4 PROGRAMMING** To plan and develop a sequence of understandable instructions for a computing system to solve a given problem or to perform a specific task
Proficiency levels	**Proficiency level 3**	**Proficiency level 4**	**Proficiency level 5**
	On my own and solving straightforward problems, I can list well-defined and routine instructions for a computing system to solve routine problems or perform routine tasks.	Independently, according to my own needs, and solving well-defined and non-routine problems, I can list instructions for a computing system to solve a given problem or perform a specific task.	As well as guiding others, I can operate with instructions for a computing system to solve a different problem or perform different tasks.

Table 15. Resources from European reference frameworks for the assessment of digital soft skills (source: own elab. from Vuorikari et al., 2022)

Knowledge

151. Knows that computer programs are made of instructions, written according to strict rules in a programming language.

152. Knows that programming languages provide structures that allow program instructions to be executed in sequence, repeatedly, or only under certain conditions, and to group them to define new instructions.

153. Knows that programs are executed by computing devices/systems, that are able to automatically interpret and execute instructions.

154. Knows that programs produce output data depending on input data, and that different inputs usually yield different outputs (e.g. a calculator will provide output 8 to the 3+5 input and output 15 to the 7+8 input).

155. Knows that, to produce its output, a program stores and manipulates data in the computer system that executes it, and that it sometimes behaves unexpectedly (e.g. faulty behaviour, malfunction, data leakage).

156. Knows that a program's blueprint is based on an algorithm, i.e. a step-wise method to produce an output from an input.

157. Knows that algorithms, and consequently programs, are designed to help solve real life problems; input data models the known information about the problem, while output data provides information relevant to the problem's solution. There are different algorithms, and consequently programs, solving the same problem.

158. Knows that any program requires time and space (hardware resources) to compute its output, depending on the input's size and/or problem's complexity.

159. Knows that there are problems that cannot be solved exactly by any known algorithm in reasonable time, thus, in practice they are frequently dealt with by approximate solutions (e.g. DNA sequencing, data clustering, weather forecasting).

Skills

160. Knows how to combine a set of program blocks (e.g. as in the visual programming tool Scratch), in order to solve a problem.

161. Knows how to detect issues in a sequence of instructions, and make changes to resolve them (e.g. to find an error in the program and correct it; to detect the reason why the execution time or output of the program is not as expected).

162. Able to identify input and output data in some simple programs.

163. Given a program, being able to recognise the execution order of instructions, and how information is processed.

Attitudes	164. Willing to accept that algorithms, and hence programs, may not be perfect in solving the problem that they aim to address. 165. Considers ethics (including but not limited to human agency and oversight, transparency, non-discrimination, accessibility, and biases and fairness) as one of the core pillars when developing or deploying AI systems. (AI)
Recommended assessment methodologies (see Table 14)	- Multiple Choice Scenario - Questionnaire - Assignment/project
Additional resources for assessment and/or certification of the skill	ICDL Professional CODING PRINCIPLES is a module available throughout Europe for certification of the main concepts and skills needed to use code and computational thinking. It helps develop the skills used to create simple computer programmes. Syllabus available at https://icdleurope.org/professional/computing/ can be a useful resource for placement/assessment tests.

ESCO SUB-SKILL: Apply digital security measures			DIGCOMP 2.2 Skill: 4.1 PROTECTING DEVICES To protect devices and digital content, and to understand risks and threats in digital environments. To know about safety and security measures and to have a due regard to reliability and privacy.
Proficiency levels	**Proficiency level 3**	**Proficiency level 4**	**Proficiency level 5**
	On my own and solving straightforward problems, I can: explain my information needs; perform well-defined and routine searches to find data, information and content in digital environments; explain how to access them and navigate between them; explain well-defined and routine personal search strategies.	Independently, according to my own needs, and solving well-defined and non-routine problems, I can: illustrate information needs; organise the searches of data, information and content in digital environments; describe how to access these data, information and content, and navigate between them; organise personal search strategies.	As well as guiding others, I can: respond to information needs; apply searches to obtain data, information and content in digital environments; show how to access these data, information and content and navigate between them; propose personal search strategies.

Knowledge

1. Knows that some online content in search result may not be open access or freely available and may require a fee or signing up for a service in order to access it.

2. Aware that online content that is available to users at no monetary cost is often paid for by advertising or by selling the user's data.

3. Aware that search results, social media activity streams and content recommendations on the internet are influenced by a range of factors. These factors include the search terms used, the context (e.g. geographical location), the device (e.g. laptop or mobile phone), local regulations (which sometimes dictate what can or cannot be shown), the behaviour of other users (e.g. trending searches or

recommendations) and the user's past online behaviour across the internet.

4. Aware that search engines, social media and content platforms often use AI algorithms to generate responses that are adapted to the individual user (e.g. users continue to see similar results or content). This is often referred to as "personalisation". (AI)

5. Aware that AI algorithms work in ways that are usually not visible or easily understood by users. This is often referred to as "black box" decision-making as it may be impossible to trace back how and why an algorithm makes specific suggestions or predictions. (AI)

Skills

6. Can choose the search engine that most likely meets one's information needs as different search engines can provide different results even for the same query.

7. Knows how to improve search results by using a search engine's advanced features (e.g. specifying exact phrase, language, region, date last updated).

8. Knows how to formulate search queries to achieve the desired output when interacting with conversational agents or smart speakers (e.g. Siri, Alexa, Cortana, Google Assistant), e.g. recognising that, for the system to be able to respond as required, the query must be unambiguous and spoken clearly so that the system can respond (AI).

9. Can make use of information presented as hyperlinks, in non-textual form (e.g. flowcharts, knowledge maps) and in dynamic representations (e.g. data).

10. Develops effective search methods for personal purposes (e.g. to browse a list of most popular films) and professional purposes (e.g. to find appropriate job advertisements).

11. Knows how to handle information overload and "infodemic" (i.e. increase of false or misleading information during a disease outbreak) by adapting personal search methods and strategies

Attitudes

12. Intentionally avoids distractions and aims to avoid information overload when accessing and navigating information, data and content.

13. Values tools designed to protect search privacy and other rights of users (e.g. browsers such as DuckDuckGo).

14. Weighs the benefits and disadvantages of using AI-driven search engines (e.g. while they might help users find the desired information, they may compromise privacy and personal data, or subject the user to commercial interests). (AI)

15. Concerned that much online information and content may not be accessible to people with a disability, for example to users who rely on screen reader technologies to read aloud the content of a web page (DA)

Recommended assessment methodologies (see Table 14)	- Self-Assessment - Multiple Choice Scenario - Questionnaire - Assignment/project
Additional resources for assessment and/or certification of the skill	ICDL Workforce IT SECURITY is a module available throughout Europe for certification of main skills and knowledge needed for the secure use of ICT in everyday settings, at home and at work. It develops the skills needed to protect data and information on computers, devices, and networks. Syllabus available at https://icdl.sharefile.com/share/view/sb3549956f774afd8 can be a useful resource for placement/assessment tests.

ESCO SUB-SKILL: Conduct web searches	**DIGCOMP 2.2 Skill: 1.1: BROWSING, SEARCHING AND FILTERING DATA, INFORMATION AND DIGITAL CONTENT** To articulate information needs, to search for data, information and content in digital environments, to access them and to navigate between them. To create and update personal search strategies.		
Proficiency levels	**Proficiency level 3**	**Proficiency level 4**	**Proficiency level 5**
	On my own and solving straightforward problems, I can: explain my information needs; perform well-defined and routine searches to find data, information and content in digital environments; explain how to access them and navigate between them; explain well-defined and routine personal search strategies.	Independently, according to my own needs, and solving well-defined and non-routine problems, I can: illustrate information needs; organise the searches of data, information and content in digital environments; describe how to access these data, information and content, and navigate between them; organise personal search strategies.	As well as guiding others, I can: respond to information needs; apply searches to obtain data, information and content in digital environments; show how to access these data, information and content and navigate between them; propose personal search strategies.

Knowledge

1. Knows that some online content in search result may not be open access or freely available and may require a fee or signing up for a service in order to access it.

2. Aware that online content that is available to users at no monetary cost is often paid for by advertising or by selling the user's data.

3. Aware that search results, social media activity streams and content recommendations on the internet are influenced by a range of factors. These factors include the search terms used, the context (e.g. geographical location), the device (e.g. laptop or mobile phone), local regulations (which sometimes dictate what can or cannot be shown), the behaviour of other users (e.g. trending searches or recommendations) and the user's past online behaviour across the internet.

4. Aware that search engines, social media and content platforms often use AI algorithms to generate responses that are adapted to the individual user (e.g. users continue to see similar results or content). This is often referred to as "personalisation". (AI)

5. Aware that AI algorithms work in ways that are usually not visible or easily understood by users. This is often referred to as "black box" decision-making as it may be impossible to trace back how and why an algorithm makes specific suggestions or predictions. (AI)

Skills

6. Can choose the search engine that most likely meets one's information needs as different search engines can provide different results even for the same query.

7. Knows how to improve search results by using a search engine's advanced features (e.g. specifying exact phrase, language, region, date last updated).

8. Knows how to formulate search queries to achieve the desired output when interacting with conversational agents or smart speakers (e.g. Siri, Alexa, Cortana, Google Assistant), e.g. recognising that, for the system to be able to respond as required, the query must be unambiguous and spoken clearly so that the system can respond (AI).

9. Can make use of information presented as hyperlinks, in non-textual form (e.g. flowcharts, knowledge maps) and in dynamic representations (e.g. data).

10. Develops effective search methods for personal purposes (e.g. to browse a list of most popular films) and professional purposes (e.g. to find appropriate job advertisements).

11. Knows how to handle information overload and "infodemic" (i.e. increase of false or misleading information during a disease outbreak) by adapting personal search methods and strategies

Attitudes	12. Intentionally avoids distractions and aims to avoid information overload when accessing and navigating information, data and content. 13. Values tools designed to protect search privacy and other rights of users (e.g. browsers such as DuckDuckGo). 14. Weighs the benefits and disadvantages of using AI-driven search engines (e.g. while they might help users find the desired information, they may compromise privacy and personal data, or subject the user to commercial interests). (AI) 15. Concerned that much online information and content may not be accessible to people with a disability, for example to users who rely on screen reader technologies to read aloud the content of a web page (DA)
Recommended assessment methodologies (see Table 14)	- Self-Assessment - Multiple Choice Scenario - Questionnaire - Assignment/project
Additional resources for assessment and/or certification of the skill	- Also DigComp skill 1.2: EVALUATING DATA, INFORMATION AND DIGITAL CONTENT (To analyse, compare and critically evaluate the credibility and reliability of sources of data, information and digital content. To analyse, interpret and critically evaluate the data, information and digital content) could be considered to enhance effective weab searching strategies and competence. - ICDL Workforce ONLINE ESSENTIALS is a module available throughout Europe for certification of essential concepts and skills relating to web browsing, effective information search, online communication and e-mail. Even if it covers more issues than the DigComp skill, Syllabus available at https://icdl.sharefile.com/share/view/s41f69edef5e47df8 can be a useful resource for placement/assessment tests.

ESCO SUB-SKILL: Create digital content			DIGCOMP 2.2 Skill: 3.1 DEVELOPING DIGITAL CONTENT To create and edit digital content in different formats, to express oneself through digital means.
Proficiency levels	**Proficiency level 3**	**Proficiency level 4**	**Proficiency level 5**
	On my own and solving straightforward problems, I can: indicate ways to create and edit well-defined and routine content in well-defined and routine formats, express myself through the creation of well-defined and routine digital means.	Independently, according to my own needs, and solving well-defined and non-routine problems, I can: indicate ways to create and edit content in different formats, express myself through the creation of digital means.	As well as guiding others, I can: apply ways to create and edit content in different formats; show ways to express myself through the creation of digital means

Knowledge

118. Knows that digital content exists in a digital form and that there are many different types of digital content (e.g. audio, image, text, video, applications) that are stored in various digital file formats.

119. Knows that AI systems can be used to automatically create digital content (e.g. texts, news, essays, tweets, music, images) using existing digital content as its source. Such content may be difficult to distinguish from human creations. (AI)

120. Aware that "digital accessibility" means ensuring that everyone, including people with disabilities, can use and navigate the internet. Digital accessibility includes accessible websites, digital files and documents, and other web-based applications (e.g. for online banking, accessing public services, and messaging and video-calling services). (DA)

121. Aware that virtual reality (VR) and augmented reality (AR) allow new ways to explore simulated environments and interactions within the digital and physical worlds.

Skills	122. Can use tools and techniques to create accessible digital content (e.g. add ALT text to images, tables and graphs; create a proper and well-labelled document structure; use accessible fonts, colours, links) following official standards and guidelines (e.g. WCAG 2.1 and EN 301 549). (DA) 123. Knows how to select the appropriate format for digital content according to its purpose (e.g. saving a document in an editable format vs one that cannot be modified but is easily printed). 124. Knows how to create digital content to support one's own ideas and opinions (e.g. to produce data representations such as interactive visualisations using basic datasets such as open government data). 125. Knows how to create digital content on open platforms (e.g. create and modify text in a wiki environment). 126. Knows how to use Internet of Things (IoT) and mobile devices to create digital content (e.g. use embedded cameras and microphones to produce photos or videos).
Attitudes	127. Inclined to combine various types of digital content and data to better express facts or opinions for personal and professional use. 128. Open to explore alternative pathways to find solutions to produce digital content. 129. Inclined to follow official standards and guidelines (e.g. WCAG 2.1 and EN 301 549) to test the accessibility of a website, digital files, documents, e-mails or other web-based applications that one has created. (DA)
Recommended assessment methodologies (see Table 14)	- Self-Assessment - Multiple Choice Scenario - Interview, Storytelling, Presentation - Questionnaire - Assignment/project

ESCO SUB-SKILL: Manage digital identity		DIGCOMP 2.2 Skill: 2.6 MANAGING DIGITAL IDENTITY: To create, and manage one or multiple digital identities, to be able to protect one's own reputation, to deal with the data that one produces through several digital tools, environments and services.	
Proficiency levels	**Proficiency level 3**	**Proficiency level 4**	**Proficiency level 5**
	On my own and solving straightforward problems, I can: discriminate a range of well-defined and routine digital identities, explain well-defined and routine ways to protect my reputation online, describe well-defined data I routinely produce through digital tools, environments or services.	Independently, according to my own needs, and solving well-defined and non-routine problems, I can: display a variety of specific digital identities, discuss specific ways to protect my reputation online, manipulate data I produce through digital tools, environments or services.	As well as guiding others, I can: use a variety of digital identities, apply different ways to protect my reputation online, use data I produce through several digital tools environment and services.

Knowledge

104. Aware that digital identity refers to (1) the method of authenticating a user on a website or an online service, and also to (2) a set of data identifying a user by means of tracing their digital activities, actions and contributions on the internet or digital devices (e.g. pages viewed, purchase history), personal data (e.g. name, username, profile data such as age, gender, hobbies) and context data (e.g. geographical location).

105. Aware that AI systems collect and process multiple types of user data (e.g. personal data, behavioural data and contextual data) to create user profiles which are then used, for example, to predict what the user might want to see or do next (e.g. offer advertisements, recommendations, services). (AI)

106. Knows that in the EU, one has the right to ask a website's or search engine's administrators to access personal data held about you (right of access), to update or correct them (right of rectification), or remove them (right of erasure, also known as the Right To Be Forgotten).

107. Aware that there are ways to limit and manage the tracking of one's activities on the internet, such as software features (e.g. private browsing, deletion of cookies) and privacy-enhancing tools and product/service features (e.g. custom consent for cookies, opting out of personalised ads).

Skills

108. Knows how to create and manage profiles in digital environments for personal purposes (e.g. civic participation, e-commerce, social media use) and professional purposes (e.g. create a profile on an online employment platform).

109. Knows how to adopt information and communication practices in order to build a positive online identity (e.g. by adopting healthy, safe and ethical behaviours, such as avoiding stereotypes and consumerism).

110. Able to conduct an individual or family name search in order to inspect one's own digital footprint in online environments (e.g. to detect any potentially troubling posts or images, to exercise one's legal rights).

111. Able to verify and modify what type of metadata (e.g. location, time) is included in pictures being shared in order to protect privacy.

112. Knows what strategies to use in order to control, manage or delete data that is collected/curated by online systems (e.g. keeping track of services used, listing online accounts, deleting accounts that are not in use).

113. Knows how to modify user configurations (e.g. in apps, software, digital platforms) to enable, prevent or moderate the AI system tracking, collecting or analysing data (e.g. not allowing the mobile phone to track the user's location). (AI)

Attitudes

114. Considers the benefits (e.g. fast authentication process, user preferences) and risks (e.g. having identities stolen, personal data exploited by third parties) when managing one or multiple digital identities across digital systems, apps and services.

115. Inclined to check and select website cookies to be installed (e.g. accepting only technical cookies) when the website provides users with this option.

116. Careful about t keeping one's own and others' personal information private (e.g. vacations or birthday photos; religious or political comments).

117. Identifies both the positive and negative implications of the use of all data (collection, encoding and processing), but especially personal data, by AI-driven digital technologies such as apps and online services. (AI)

Recommended assessment methodologies (see Table 14)	- Self Assessment - Multiple Choice Scenario - Questionnaire - Assignment/project
Additional resources for assessment and/or certification of the skill	- Also DigComp 4.2 PROTECTING PERSONAL DATA AND PRIVACY (To protect personal data and privacy in digital environments to understand how to use and share personally identifiable information while being able to protect oneself and others from damages. To understand that digital services use a "Privacy policy" to inform how personal data is used) could be considered to enhance effective digital identity management strategies and competence. - ICDL Workforce DATA PROTECTION is a module available throughout Europe for certification of data protection concepts and principles, data subject rights, data protection policies and measures, and regulatory compliance. It develops the skills needed to manage and process personal data in the context of GDPR. Syllabus available at https://icdl.sharefile.com/share/view/s9d7942f33464a2eb can be a useful resource for placement/assessment tests.

ESCO SUB-SKILL: Operate digital hardware		DIGCOMP 2.2 SKILL: 5.1 Solving Technical Problems To identify technical problems when operating devices and using digital environments, and to solve them (from trouble-shooting to solving more complex problems).	
Proficiency levels	**Proficiency level 3**	**Proficiency level 4**	**Proficiency level 5**
	On my own and solving straightforward problems, I can: indicate well-defined and routine technical problems when operating devices and using digital environments; select well-defined and routine solutions to them.	Independently, according to my own needs, and solving well-defined and non-routine problems, I can: differentiate technical problems when operating devices and using digital environments; select solutions to them.	As well as guiding others, I can: assess technical problems when using digital environments and operating digital devices; apply different solutions to them.

Knowledge

217. Knows the main functions of the most common digital devices (e.g. computer, tablet, smartphone).

218. Knows some reasons why a digital device may fail to connect online (e.g. wrong Wi-fi password, airplane mode on).

219. Knows that computing power or storage capacity can be improved to overcome fast obsolescence of hardware (e.g. by contracting power or storage as a service).

220. Aware that the most frequent sources of problems in Internet of Thing (IoT) and mobile devices, and in their applications, are related to connectivity/network availability, battery/power, limited processing power.

221. Aware that AI is a product of human intelligence and decision-making (i.e. humans choose, clean and encode the data, they design the algorithms, train the models, and curate and apply human values to the outputs) and therefore does not exist independently of humans. (AI)

Skills	222. Knows how to identify and solve a camera and/or a microphone issue when in an online meeting. 223. Knows how to verify and troubleshoot problems related to interconnected IoT devices and their services. 224. Takes a step-by-step approach to identify the root of a technical problem (e.g. hardware vs software) and explores various solutions when facing a technical malfunction. 225. Knows how to find solutions on the internet when facing a technical problem
Attitudes	226. Takes an active and curiosity driven approach to explore how digital technologies operate.
Recommended assessment methodologies (see Table 14)	- Self-Assessment - Multiple Choice Scenario - Questionnaire - Case study
Additional resources for assessment and/or certification of the skill	ICDL Workforce COMPUTER ESSENTIALS is a module available throughout Europe for certification of the main concepts and skills needed for using devices, computers, ICT, and software effectively. It develops the key skills needed to start using computers or other devices effectively. Syllabus available at https://icdl.sharefile.com/share/view/s170aaa349d84652a can be a useful resource for placement/assessment tests.

ESCO SUB-SKILL: Use communication and collaboration software			DIGCOMP 2.2 Skill: 2.4 COLLABORATING THROUGH DIGITAL TECHNOLOGIES: To use digital tools and technologies for collaborative processes, and for co-construction and co-creation of data, resources and knowledge.
Proficiency levels	**Proficiency level 3**	**Proficiency level 4**	**Proficiency level 5**
	On my own and solving straightforward problems, I can: select well-defined and routine digital tools and technologies for collaborative processes.	Independently, according to my own needs, and solving well-defined and non-routine problems, I can: select digital tools and technologies for collaborative processes.	As well as guiding others, I can: propose different digital tools and technologies for collaborative processes.

Knowledge

82. Aware of the advantages of using digital tools and technologies for remote collaborative processes (e.g. reduced commuting time, join specialised skills together regardless of location).

83. Understands that in order to co-create digital content with other people, good social skills (e.g. clear communication, ability to clarify misunderstandings) are important to compensate for the limitations of online communication.

Skills

84. Knows how to use digital tools in a collaborative context to plan and share tasks and responsibilities within a group of friends, a family or a sport or work team (e.g. digital calendar, planners for trips and leisure activities).

85. Knows how to use digital tools to facilitate and improve collaborative processes, for example through shared visual boards and digital canvases (e.g. Mural, Miro, Padlet).

86. Knows how to engage collaboratively in a wiki (e.g. negotiate opening a new entry on a subject that is missing from Wikipedia to increase public knowledge).

87. Knows how to use digital tools and technologies in a remote working context for idea generation and co-creation of digital content (e.g. shared mind maps and whiteboards, polling tools). (RW)

88. Knows how to evaluate the advantages and disadvantages of

	digital applications for making collaboration effective (e.g. the use of online spaces for co-creation, shared project management tools).
Attitudes	89. Encourages everyone to express their own opinions constructively when collaborating in digital environments. 90. Acts in trustworthy ways to achieve group goals when engaging in co-construction of resources or knowledge. 91. Inclined to use appropriate digital tools for fostering collaboration between the members of a team while, at the same time, ensuring digital accessibility. (DA)
Recommended assessment methodologies (see Table 14)	- Self-Assessment - Multiple Choice Scenario - Assignment/project
Additional resources for assessment and/or certification of the skill	- Also DigComp 2.1: INTERACTING THROUGH DIGITAL TECHNOLOGIES (To interact through a variety of digital technologies and to understand appropriate digital communication means for a given context) could be considered to enhance effective digital communication and collaboration strategies and competences. - ICDL Workforce ONLINE COLLABORATION is a module available throughout Europe for certification of the main concepts and skills needed to collaborate online using web-based tools and services. It develops the skills needed to collaborate with others using online collaboration tools. Syllabus available at https://icdl.sharefile.com/share/view/sf33750cf8a7423db can be a useful resource for placement/assessment tests.

T2.4 THINKING CREATIVELY AND INNOVATIVELY (INCLUDING FUTURES LITERACY)	Generate new ideas or combine existing ones to develop innovative, novel solutions.

ESCO SUB-SKILLS:	ENTRECOMP Skill: 1.2 CREATIVITY
• Improvise • Think creatively • Think innovatively	Develop several ideas and opportunities to create value, including better solutions to existing and new challenges. Explore and experiment with innovative approaches. Combine knowledge and resources to achieve valuable effects.

Progression level	Progression level 3 - EXPERIMENT	Progression level 4 - DARE	Progression level 5 - IMPROVE
Thread: BE CURIOUS AND OPEN	I can experiment with my skills and competences in situations that are new to me.	I can actively search for new solutions that meet my needs.	I can actively search for new solutions that improve the value-creating process.
Thread: DEVELOP IDEAS	I can experiment with different techniques to generate alternative solutions to problems, using available resources in an effective way.	I can test the value of my solutions with end users.	I can describe different techniques to test innovative ideas with end users.
Thread: DEFINE PROBLEMS	I can take part in group dynamics aimed at defining open-ended problems.	I can reshape open-ended problems to fit my skills.	I can describe and explain different approaches to shaping open-ended problems and different problem-solving strategies.

Table 16. Resources from European reference frameworks for the assessment of "Thinking creatively and innovatively" soft skill (source: own elab. from McCallum et al., 2018 and Bianchi et al. 2022))

Recommended assessment methodologies (see Table 14)

- Self Assessment
- Peer Assessment
- Interview, Storytelling, Presentation
- Assignment/project
- Case study

Additional resources for assessment and/or certification of the skill

- PISA 2022 (PISA is the OECD's Programme for International Student Assessment) will introduce Creative Thinking assessment in its framework. Results will be available in 2024 but assessment model and examples can be found in OECD (2019).

- Also the Australian Council for Educational Research has developed a framework for Creative Thinking development and assessment. A kind of rubric built on three levels of mastery can be found in Ramalingam et al. (2020), page 11.

- Some interesting Creative Thinking self-assessment tools can be found on the web: for instance Sklillsyouneed Creative Thinking self-assessment test at https://www.skillsyouneed.com/quiz/979666

ESCO SUB-SKILLS:	GREENCOMP Skill: 3.1 FUTURES LITERACY
• **Futures literacy**	To envision alternative sustainable futures by imagining and developing alternative scenarios and identifying the steps needed to achieve a preferred sustainable future.

Knowledge

1 Knows the difference between expected, preferred and alternative futures for sustainability scenarios.

2 Knows the difference between short, medium and long term approaches and their implications for sustainability scenarios.

3 Knows that scenario development can factor in past events and current signals of change.

4 Knows that scenarios can inform decision making for a desired sustainable future.

5 Knows that effects caused by humans play a major role when mapping alternative and preferred future scenarios.

Skills	1 Can envisage alternative futures for sustainability that are grounded in science, creativity and values for sustainability. 2 Can analyse and evaluate futures and their opportunities, limitations and risks. 3 Can identify action and initiatives that lead to a preferred future. 4 Can anticipate future implications by looking at past trends and present conditions.
Attitudes	1 Has a long-term perspective when planning, assessing and evaluating sustainability actions. 2 Is concerned about the impact of one's own action on the future. 3 Is aware that the projected consequences on self and community may influence preferences for certain scenarios above others. 4 Seeks to combine rigorous methods for thinking about the future with creative and participatory approaches.
Recommended assessment methodologies (see Table 14)	- Self-Assessment - Interview, Storytelling, Presentation - Assignment/project - Case study
Additional resources for assessment and/or certification of the skill	- beFORE project Consortium has developed an on-line training course for students, available at: http://futureoriented.eu/foresight-course/ - Also the Institute for the Future (IFTF) provides a free on-line learning opportunity about futures thinking. See at https://www.iftf.org/futuresthinkingspecialization/

T3.2 TAKING A PROACTIVE APPROACH	**Accept responsibilities for managing activities and adopt a forward-looking approach to anticipate problems but also identify opportunities.**
ESCO SUB-SKILLS: • **Assume responsibility** • **Make decisions**	**GREENCOMP Skill: 3.2 ADAPTABILITY** To manage transitions and challenges in complex sustainability situations and make decisions related to the future in the face of uncertainty, ambiguity and risk.

Knowledge	1 Knows that human actions may have unpredictable, uncertain and complex consequences on the environment. 2 Knows that there is no single solution to complex socioecological problems, but rather different alternatives depending on time and context. 3 Knows about risks associated with transformations of the natural environment by humans. 4 Knows which aspects of personal lifestyle have higher impacts on sustainability and require adapting (e.g. air travel, car usage, meat consumption, fast fashion). 5 Knows the importance of the link between local impacts and global sustainability.
Skills	1 Can adapt to different approaches when working on sustainability. 2 Can identify and adapt to different lifestyles and consumption patterns to use fewer natural resources. 3 Can take into account local circumstances when dealing with sustainability issues and opportunities. 4 Can navigate the ambiguity and uncertainty around sustainability issues while thinking about alternatives.
Attitudes	1 Acknowledges the emotional impact of climate change, loss of biodiversity and impoverishment. 2 Is willing to discontinue unsustainable practices and try alternative solutions.

Table 17. Resources from European reference frameworks for the assessment of "Taking a proactive approach" soft skill (source: own elab. from McCallum et al., 2018 and Bianchi et al. 2022, Sala et al., 2020))

	3 Is comfortable considering sustainable options, even if competing with personal interests. 4 Is flexible, resourceful and adaptable in coping with unexpected environmental changes. 5 Copes with trade-offs in decisions on sustainability within and across domains (environmental, social, economic, cultural, political) and across time and space.
Recommended assessment methodologies (see Table 14)	- Self Assessment - Interview, Storytelling, Presentation - Assignment/project - Case study
Additional resources for assessment and/or certification of the skill	An online test for Decision making self-assessment can be found at https://www.mindtools.com/pages/article/newTED_79.htm

ESCO SUB-SKILLS:	**LIFECOMP: L1 GROWTH MINDSET**
• **Manage personal progression**	Belief in one's and others' potential to continuously learn and progress.

Awareness descriptor	P1.1 Awareness of and confidence in one's own and others' abilities to learn, improve and achieve with work and dedication
Understanding descriptor	P1.2 Understanding that learning is a lifelong process that requires openness, curiosity and determination
Action descriptor	P1.3 Reflecting on other people's feedback as well as on successful and unsuccessful experiences to continue developing one's potential
Recommended assessment methodologies (see Table 14)	- Self-Assessment - Peer assessment

ESCO SUB-SKILLS:	ENTRECOMP: 3.1 TAKING THE INITIATIVE
• **Show commitment** • **Show determination** • **Show initiative**	Initiate processes that create value. Take up challenges. Act and work independently to achieve goals, stick to intentions and carry out planned tasks.

Progression level	Progression level 3 - EXPERIMENT	Progression level 4 - DARE	Progression level 5 - IMPROVE
Thread: TAKE RESPONSI-BILITY	I can take individual and group responsibility to carry out simple tasks in valuecreating activities.	I can take individual and group responsibility in value-creating activities.	I can delegate responsibility appropriately.
Thread: WORK INDEPEN-DENTLY	I can initiate simple value-creating activities.	I am driven by the possibility of being able to initiate value-creating activities independently.	I can initiate value-creating activities alone and with others.
Thread: TAKE ACTION	I actively face challenges, solve problems and seize opportunities to create value.		I take action on new ideas and opportunities, which will add value to a new or existing value-creating venture.

Recommended assessment methodologies (see Table 14)

- Self-Assessment
- Peer assessment
- Interview, storytelling, presentation
- Observation
- Assignment/project

T3.3 MAINTAINING A POSITIVE ATTITUDE

Withstand adversity, demonstrate resilience and find ways to resolve or manage the effects of difficult life events.

ESCO SUB-SKILLS:

- **Approach challenges positively**
- **Show confidence**

ENTRECOMP: 2.1 SELF-AWARENESS & SELF-EFFICACY

Reflect on your needs, aspirations and wants in the short, medium and long term. Identify and assess your individual and group strengths and weaknesses. Believe in your ability to influence the course of events, despite uncertainty, setbacks and temporary failures.

Progression level	Progression level 3 - EXPERIMENT	Progression level 4 - DARE	Progression level 5 - IMPROVE
Thread: FOLLOW YOUR ASPIRATIONS	I can commit to fulfilling my needs, wants, interests and goals.	I can reflect on my individual and group needs, wants, interests and aspirations in relation to opportunities and future prospects.	I can translate my needs, wants, interests and aspirations into goals that help me reach them.
Thread: IDENTIFY YOUR STRENGTHS AND WEAKNESSES	I can judge my strengths and weaknesses and those of others in relation to opportunities for creating value.	I am driven by the desire to use my strengths and abilities to make the most of opportunities to create value.	I can team up with others to compensate for our weaknesses and add to our strengths.
Thread: BELIEVE IN YOUR ABILITY	I can judge the control I have over my achievements (compared with any control from outside influences).	I believe I can influence people and situations for the better.	I believe in my ability to carry out what I have imagined and planned, despite obstacles, limited resources and resistance from others.

Recommended assessment methodologies (see Table 14)	- Self Assessment - Peer assessment - Observation - Assignment/project
Additional resources for assessment and/or certification of the skill	A useful resource for Taking the initiative development and self-assessment can be found at https://EntreCompcertificate.eu/wp-content/uploads/2021/03/Taking-the-initiative_Learning-Resources.pdf

ESCO SUB-SKILLS:

- **Cope with stress**
- **Cope with uncertainty**
- **Manage frustration**

ENTRECOMP: 3.3 COPING WITH UNCERTAINTY, AMBIGUITY & RISK

Make decisions when the result of that decision is uncertain, when the information available is partial or ambiguous, or when there is a risk of unintended outcomes. Within the valuecreating process, include structured ways of testing ideas and prototypes from the early stages, to reduce risks of failing. Handle fast-moving situations promptly and flexibly.

Progression level	Progression level 3 - EXPERIMENT	Progression level 4 - DARE	Progression level 5 - IMPROVE
Thread: COPE WITH UNCERTAINTY AND AMBIGUITY	I can discuss the role that information plays in reducing uncertainty, ambiguity and risk.	I can actively look for, compare and contrast different sources of information that help me reduce ambiguity, uncertainty, and risks in making decisions.	I can find ways of making decisions when the information is incomplete. I can apply the concept of affordable losses to make decisions when creating value.

Thread: CALCULATE RISK	I can tell the difference between acceptable and unacceptable risks.	I can weigh up the risks and benefits of self-employment with alternative career options, and make choices that reflect my preferences.	I can apply the concept of affordable losses to make decisions when creating value.
Thread: MANAGE RISK	I can critically evaluate the risks associated with an idea that creates value, taking into account a variety of factors.	I can critically evaluate the risks related to the formal set-up of a value-creating venture in the area in which I work.	I can demonstrate that I can make decisions by weighing up both the risks and the expected benefits of a value-creating activity.

Recommended assessment methodologies (see Table 14)	- Self-Assessment - Peer assessment - Observation - Assignment/project
Additional resources for assessment and/or certification of the skill	A useful resource for *Coping with uncertainty, ambiguity & risk* development and self-assessment can be found at https://EntreCompcertificate.eu/wp-content/uploads/2021/03/Coping-with-ambiguity-uncertainty-and-risk.pdf

Table 18. Resources from European reference frameworks for the assessment of "TMantaining a positive attitude" soft skill (source: own elab. from McCallum et al., 2018 and Bianchi et al. 2022, Sala et al., 2020)

T4.1 COMMUNICATING	**Express and exchange information, ideas, concepts, thoughts and feelings and resolve disagreements in formal and informal contexts, through the use of shared systems of words, signs and rules.**

ESCO SUB-SKILLS:	LIFECOMP skill: S2. Communication
• **Address an audience** • **Moderate a discussion** • **Negotiate compromises** • **Promote ideas, products, services** • **Report facts Resolve conflicts**	Use of relevant communication strategies, domain-specific codes and tools, depending on the context and the content.

Awareness descriptor	Awareness of the need for a variety of communication strategies, language registers, and tools that are adapted to context and content.
Understanding descriptor	Understanding and managing interactions and conversations in different socio-cultural contexts and domain-specific situations.
Action descriptor	Listening to others and engaging in conversations with confidence, assertiveness, clarity and reciprocity, both in personal and social contexts.
Recommended assessment methodologies (see Table 14)	- Self-Assessment - Peer assessment - Observation - Interview, storytelling, presentation - Assignment/project

Table 19. Resources from European reference frameworks for the assessment of "Communicating" soft skill (source: own elab. from Sala et al., 2020)

Additional resources for assessment and/ or certification of the skill	- An online test for Communicating skills self-assessment can be found at https://www.mindtools.com/pages/article/newCS_99.htm - An example of rubric for oral communication assessment can be found at https://www.ubalt.edu/merrick/uploads/rubrics/Oral_Communication_Skills.doc - An example of rubric for written communication assessment can be found at https://www.uhd.edu/provost/ie/Documents/Written_Communication_Draft_Rubric_10_10_14.pdf - An example of rubric for negotiation assessment can be found at https://wlresources.dpi.wi.gov/courseware/lesson/303/overview

T4.3 COLLABORATING IN TEAMS AND NETWORKS	**Support or develop a group to work towards a common goal in a way which shows understanding and respect of others' roles and competencies.**
ESCO SUB-SKILLS: • **Build networks** • **Work in teams**	**ENTRECOMP skill: 3.4 WORKING WITH OTHERS** Work together and co-operate with others to develop ideas and turn them into action. Network. Solve conflicts and face up to competition positively when necessary.

Progression level	**Progression level 3 - EXPERIMENT**	**Progression level 4 - DARE**	**Progression level 5 - IMPROVE**
Thread: ACCEPT DIVERSITY (PEOPLE'S DIFFE-RENCES)	I can combine different contributions to create value.	I can value diversity as a possible source of ideas and opportunities.	
Thread: DEVELOP EMOTIONAL INTELLI-GENCE	I can express my (or my team's) value-creating ideas assertively.	I can face and solve conflicts.	I can compromise where necessary.

Table 20. Resources from European reference frameworks for the assessment of "Communicating" soft skill (source: own elab. from McCallum et al., 2018, and INCA, 2004)

Thread: LISTEN ACTIVELY	I can listen to other people's ideas for creating value without showing prejudice.	I can listen to my end users.	I can compromise where necessary.

Recommended assessment methodologies (see Table 14)	- Self-Assessment - Peer assessment - Observation - Interview, storytelling, presentation - Assignment/project
Additional resources for assessment and/or certification of the skill	- An example of rubric for team working assessment can be found at https://www.rit.edu/affiliate/weimpact/documents/FinalWEIMPACT_Teamwork%20%20Rubric%202%201%20(2).pdf - An example of rubric for networking activity assessment can be found at https://static1.squarespace.com/static/51a0d375e4b022d3644173ec/t/5ac655d6f950b7cc111b6407/1522947547690/Networking+Activity+Rubric_32318.pdf

ESCO SUB-SKILLS:	**INCA Skill: INTERCULTURAL COMPETENCE**
• **Demonstrate intercultural competence**	To interact both effectively and in a way that is acceptable to others when you are working in a group whose members have different cultural backgrounds.

Proficiency level	**Basic**	**Intermediate**
Tolerance of ambiguity	Deals with ambiguity on a one-off basis, responding to items as they arise. May be overwhelmed by ambiguous situations which imply high involvement.	Has begun to acquire a repertoire of approaches to cope with ambiguities in low involvement situations. Begins to accept ambiguity as a challenge.

Behavioural flexibility	Adopts a reactive/defensive approach to situations. Learns from isolated experiences in a rather unsystematic way.	Previous experience of required behaviour begins to influence behaviour in everyday parallel situations. Sometimes takes the initiative in adopting/conforming to other cultures' behaviour patterns.
Communicative awareness	Attempts to relate problems of intercultural interaction to different communicative conventions, but lacks the necessary knowledge for identifying differences. Tends to hold on to his own conventions and expects adaptation from others. Is aware of difficulties in interaction with non-native-speakers, but has not yet evolved principles to guide the choice of strategies (metacommunication, clarification or simplification).	Begins to relate problems of intercultural interaction to conflicting communicative conventions and attempts to clarify his own or to adapt to the conventions of others. Uses a limited repertoire of strategies (metacommunication, clarification, simplification) to solve and prevent problems when interacting with a non-native-speaker.
Knowledge discovery	Draws on random general knowledge and minimal factual research about other cultures. Learns by discovery and is willing to modify perceptions but not yet systematic.	Has recourse to some information sources in anticipation of everyday encounters with the other cultures, and modifies and builds on information so acquired, in the light of actual experience. Is motivated by curiosity to develop his knowledge of his own culture as perceived by others.
Respect for otherness	Is not always aware of difference and, when it is recognised, may not be able to defer evaluative judgement as good or bad. Where it is fully appreciated, adopts a tolerant stance and tries to adapt to low-involving demands of the foreign culture.	Accepts the other´s values, norms and behaviours in everyday situations as neither good nor bad, provided that basic assumptions of his own culture have not been violated. Is motivated to put others at ease and avoid giving offence.

Empathy	Tends to see the cultural foreigner's differences as curious, and remains confused about the seemingly strange behaviours and their antecedents. Nonetheless tries to 'make allowances'.	Has the beginnings of a mental checklist of how others may perceive, feel and respond differently to, a range of routine circumstances. Tends increasingly to see things intuitively from the other's point of view.

Recommended assessment methodologies (see Table 14)

- Self-Assessment
- Peer assessment
- Observation
- Case study
- Interview, storytelling, presentation
- Assignment/project

Additional resources for assessment and/or certification of the skill

INCA project's outcomes, available at https://ec.europa.eu/migrant-integration/library-document/inca-project-intercultural-competence-assessment_en offer a wide selection of resources for intercultural competency assessment

T4.3 APPLYING ENVIRONMENTAL SKILLS AND COMPETENCES (proposed new name: APPLYING CORE SKILLS AND COMPETENCIES FOR THE GREEN TRANSITION)	Reflect on the short and long-term impact of individual behaviours on the physical and social environment and adopt a sustainable work and lifestyle. Recognize the individual and collective responsibility for the protection and restoration of the local and global environment and inspire others.
ESCO SUB-SKILLS: • **Adopt ways to foster biodiversity and animal welfare**	**GREENCOMP: 3.2 PROMOTE NATURE** To acknowledge that humans are part of nature; and to respect the needs and rights of other species and of nature itself in order to restore and regenerate healthy and resilient ecosystems.
Knowledge	1. Knows about the main parts of the natural environment (geosphere, biosphere, hydrosphere, cryosphere and atmosphere) and that living organisms and non-living components are closely linked and depend on each other. 2. Knows that our wellbeing, health and security depend on the wellbeing of nature. 3. Knows that people are part of nature and that the divide between human and ecological systems is arbitrary. 4. Knows that humans shape ecosystems and that human activities can rapidly and irreversibly damage ecosystems. 5. Knows that damaging and exhausting natural resources can lead to disasters and conflicts (e.g. loss of biodiversity, draughts, mass migration and war). 6. Knows about the need to decouple production from natural resources and wellbeing from consumption.
Skills	1. Can assess own impact on nature and consider the protection of nature an essential task for every individual. 2. Can see and imagine humans living together and respecting other life forms. 3. Can acknowledge cultural diversity within planetary limits.

Table 21. Resources from European reference frameworks for the assessment of "Applying environmental skills and competences" soft skill (source: own elab. from Bianchi et al., 2022)

	4. Can find opportunities to spend time in nature and helps to restore it. 5. Can identify processes or action that avoid or reduce the use of natural resources
Attitudes	1. Cares about a harmonious relationship existing between nature and humans. 2. Is critical towards the notion that humans are more important than other life forms. 3. Shows empathy with all life forms. 4. Is appreciative of nature's role in our wellbeing, health and security. 5. Continuously strives to restore nature.
Recommended assessment methodologies (see Table 14)	- Self-Assessment - Interview, Storytelling, Presentation - Assignment/project - Case study
Additional resources for assessment and/or certification of the skill	The ongoing Horizon 2020 GreenSCENT projects aims at developing a competence framework embracing all the Green Deal focus areas through an iterative, participated, experience and learning-by-doing based design approach. Expected outcomes of the project are: training kits codesigned for implementing the framework; GreenSCENTbox, the set of digital, physical and hybrid demonstrators developed by the project; and ECCEL, a European "driving license" for Climate and Environmental competences and skills, that will be tested during the project. The development of the project can be followed at https://www.green-scent.eu/

ESCO SUB-SKILLS:	GREENCOMP: 1.1 VALUING SUSTAINABILITY
• **Evaluate environmental impact of personal behaviour**	To reflect on personal values; identify and explain how values vary among people and over time, while critically evaluating how they align with sustainability values.

Knowledge

1 Knows the main views on sustainability: anthropocentrism (human-centric), technocentrism (technological solutions to ecological problems) and ecocentrism (nature-centred), and how they influence assumptions and arguments.

2 Knows the main values and principles underpinning socio-economic models and their relation to sustainability.

3 Knows that values and principles influence action that can damage, does not harm, restores or regenerates the environment.

4 Knows that various cultures and generations may attach more or less importance to sustainability depending on their value systems.

5 Knows that when human demand for resources is driven by greed, indifference and unfettered individualism, this has negative consequences for the environment.

6 Knows how one's position in society influences personal values.

Skills

1 Can critically assess and compare underlying sustainability values and principles in arguments, action, policies and political claims.

2 Can evaluate issues and action based on sustainability values and principles.

3 Can bring personal choices and action in line with sustainability values and principles.

4 Can articulate and negotiate sustainability values, principles and objectives while recognising different viewpoints.

5 Can identify and include values of communities, including minorities, in problem framing and decision making on sustainability.

Attitudes

1 Is prone to acting in line with values and principles for sustainability.

2 Is willing to share and clarify views on sustainability values.

3 Is open-minded to others and their world-views.

4 Is ready to critique and value various cultural contexts depending on their impact on sustainability.

Recommended assessment methodologies (see Table 14)	- Self Assessment - Peer assessment - Interview, Storytelling, Presentation - Assignment/project
Additional resources for assessment and/ or certification of the skill	See above

ESCO SUB-SKILLS:	**GREENCOMP: 4.2 COLLECTIVE ACTION**
• **Engage others in environment friendly behaviours**	To act for change in collaboration with others.

Knowledge	1 Knows the main sustainability stakeholders in one's own community and how to contact them. 2 Knows that working with others to promote nature and support fairness requires respect for democracy. 3 Knows how to work with diverse participants to create inclusive visions for a more sustainable future. 4 Knows the importance of empowering individuals and organisations to work collaboratively.
Skills	1 Can build diverse coalitions to address wicked problems related to sustainability. 2 Can create transparent, inclusive and community-driven processes. 3 Can create opportunities for joint action across communities, sectors and regions. 4 Can work collectively in sustainability change processes. 5 Can identify stakeholders' strengths. 6 Can act in line with shared narratives on sustainable futures.

Attitudes	1 Is willing to engage with others to challenge the status quo. 2 Is motivated to collaborate in order to shape inclusive sustainable futures. 3 Prioritises sustainability values and interests when taking collective action. 4 Wants to give back to the community and nature. 5 Is committed to change for a more inclusive and fair future
Recommended assessment methodologies (see Table 14)	- Self-Assessment - Peer assessment - Interview, Storytelling, Presentation - Assignment/project - Case study
Additional resources for assessment and/or certification of the skill	See above

ESCO SUB-SKILLS:

- **Adopt ways to reduce negative impact of consumption**
- **Adopt ways to reduce pollution**

GREENCOMP: 4.3 INDIVIDUAL INITIATIVE

To identify own potential for sustainability and to actively contribute to improving prospects for the community and the planet.

Knowledge	1 Knows one's own potential to bring about positive environmental change. 2 Knows that preventive action should be taken when certain action or inaction may damage human health and all life forms (precautionary principle). 3 Knows that individuals have a commitment towards society and the environment. 4 Knows that maintaining the status quo and inaction are also choices. 5 Knows that every action has an impact even if not immediate.

Skills	1 Can apply the following principles: using fewer resources, doing better with fewer resources, and reusing the same resources. 2 Can take personal initiative and persist in achieving sustainability objectives even in contexts of uncertainty. 3 Can act promptly, even in the face of uncertainty and unforeseen events, keeping in mind the precautionary principle. 4 Can mobilise others to adopt more sustainable choices. 5 Can overcome one's own resistance to change. 6 Can identify a network of relevant stakeholders.
Attitudes	1 Cares proactively for the planet. 2 Is willing to take action to try to solve complex sustainability problems. 3 Advocates for individual and collective care for those in need and for the planet. 4 Is confident about anticipating and influencing sustainable changes. 5 Recognises that everyday action matters.
Recommended assessment methodologies (see Table 14)	- Self Assessment - Interview, Storytelling, Presentation - Assignment/project - Case study
Additional resources for assessment and/ or certification of the skill	See above

4.3.1 Some indications for possible use of assessment resources

The reference frameworks for the selected soft skills can be used by different actors in the VET system in various ways. Some indications on their operational use are given below:

- public bodies responsible for VET policies can use the frameworks to define, in notices for the implementation of training activities or in methodological documents, which soft skills are to be preferentially or compulsorily included in the design of training pathways, both individual (e.g. in work-based learning) and group-based, and their exact and shared definition;

- organisations providing training activities can use the reference frameworks for the design of training activities, making the target soft skills explicit and identifying, where present, knowledge, skills and attitudes that need to be developed in order to improve the learners' mastery of them (learning outcomes). Where present, it is possible to use the different proficiency/progression levels to more precisely calibrate the objective learning levels on the basis of the learner's entry level and the general objectives of the training activity;

- it is possible to use the learning outcomes (KSA) and/or the rubrics indicated in the additional resources to define assessment tools for competence mastery, selecting the assessment methodologies among those suggested; for example, questionnaires for self-assessment or grids for observation, peer assessment, etc. can be constructed;

- in some cases, where syllabuses exist, it is possible to construct placement tests, useful for the assessment of the initial levels of mastery of a soft skill;

- where certifications relating to the soft skills considered have been identified, especially in the digital skills sphere, it appears possible to define in the training design phase whether to include the certification of the competences as a result among the training objectives, whether to use the relative syllabuses for the definition of the contents and objectives of the training activities and for the possible preparation of placement tests, or whether more simply to offer learners information regarding the presence of certification opportunities that can be pursued individually and autonomously;

- for company tutors in work-based learning pathways, the tables and rubrics identified offer the possibility of constructing observation grids of the appli-

cation of soft skills in the work context, allowing the explication and greater visibility of training objectives and skills that are often not perceived as clearly and immediately as the technical-professional ones;

- in transnational mobility projects reference frameworks are useful for agreeing between the different partners on the different target competences and ways of assessing learning. It has to be taken into account that ESCOs and some reference frameworks are available in several European languages and are thus helpful in overcoming language barriers.

5.0 Analysis of good practices collected in the EUSALP context

In order to complete the framework outlined in the past chapters through the analysis of scientific literature, a reconnaissance of good practices in the field of soft skills development and evaluation was carried out, taking the EUSALP cooperation area as a priority but not exclusive reference. The purpose was to identify some examples of actions that could be considered good practices to be taken as a reference to develop further interventions on the topics examined by this work: not simply training activities relating to soft skills, but rather complex interventions, articulated on several actions, in a systemic logic, capable of considering the topic of training and evaluation of soft skills under various aspects.

The method for the identification and analysis of good practices refers to a well-established one developed by ISFOL already in the mid-2000s (see e.g. ISFOL, 2004) and subsequently used in various fieldwork. According to this methodology, good training practice is that which, in the light of formalised and widely shared criteria, stands out as an experience of quality, understood both in terms of the experience itself and in terms of effectiveness and satisfaction of the problems of the stakeholders and systems in which it is placed. For ISFOL, a good practice to be transferred must in fact meet four requirements:

- effectiveness (achievement of planned results);
- effectiveness (achievement of planned results);
- reproducibility (ability to solve problems in similar situations, adapting to regulatory, financial, organisational and contextual constraints and conditions);

- transferability (ability to solve problems of a similar nature, but in different situations and conditions);

- mainstreaming (ability to produce visible changes in users, organisations, territory and reference systems).

Since a qualitative analysis based on direct interviews of the good practices was not possible, due to the objective time and resource constraints of this research work, we opted for the preparation of a self-compiled questionnaire for surveying and describing the good practice, available online via CAWI (Computer Assisted Web Interviewing) methodology.

The questionnaire was developed with reference to the findings from the analysis of the scientific literature, which made it possible to identify an 'ideal' profile that a soft skills intervention should possibly have. The questionnaire is divided into the following thematic sections:

- personal details section: identifying the name of the good practice, the reference body, the contact person and the website to consult, if any;

- general description of the good practice: geographical coverage, source of funding, involvement and role of "institutional" bodies such as National, Regional or Provincial Administrations, if any; a good practice with a wide geographical coverage, involving at least one institutional body, in particular with functions of validation and mainstreaming of results, is considered ideal;

- description of the activities implemented within the good practice: types of soft skills considered; spectrum of activities implemented: classification and definition of soft skills; analysis of soft skills needs by the labour market; definition of soft skills learning paths (teaching methodologies to be used, curricula, etc.); development of teaching materials (lessons, modules, case studies, etc.) for learning soft skills; development of methodologies and tools for the observation/assessment of soft skills; development of reference systems (e.g. definition of competency levels, assessment rubrics) for the validation of one or more soft skills; elaboration of training paths and teaching materials for training of trainers (e.g. designers, teachers, tutors, etc.) on soft skills; elaboration of guidelines/recommendations to promote the development/use of soft skills in VET policies and activities; other. The ideal good practice covers as many soft skills (with particular attention to the seven prioritised soft skills identified in Chapter 3) and activities as possible;

- methodologies and technologies used: training methodologies; training technologies used; type of deliverables produced; assessment methodologies and

tools. The ideal good practice uses a mix of online and face-to-face courses (blended methodologies), has developed deliverables in interactive digital format, available online or via apps/software, and has developed a mix of evaluation methodologies;

- reproducibility and transferability, with specific reference to the contexts of work-based learning, transnational mobility of learners, the specific characteristics of the Alpine economy, the presence of possible critical aspects to be further investigated/developed: the ideal good practice must have specifically considered one or more of these contexts or be easily adaptable to them;

- presence of further qualifying aspects, such as the taking into account of gender aspects, special educational needs, the presence of documented evidence of efficacy, the presence of on-line repository or other tools to supporting professional community of practice, the presence of actions and tools to favour the re-elaboration of the learning experience after its conclusion.

The request to identify and describe good practices was disseminated by the Autonomous Province of Trento to all the 48 regions and autonomous provinces present in EUSALP and to the members of EUSALP Action Group 3, as well as to a selected group of other potentially interested parties, individuated in the network of relations of IRES FVG and Fondazione Demarchi, also outside the EUSALP area. These actors were also asked to further disseminate the call for good practices to other entities within each EUSALP region. The good practice survey was conducted in May 2022 via an online questionnaire. At the end of the survey period, the descriptive forms of 7 good practices were acquired, although there were more than 200 accesses to the questionnaire webpage; Table 22 below provides an overview of the surveyed good practices.

The theoretical "ideal" good practice model, defined on the basis of desk analysis, describes a complex and articulated intervention, made up of various integrated actions that include the entire cycle of analysis, design, realisation and evaluation of training activities relative to the development and evaluation of a set of several soft skills, possibly carried out with the contribution of institutional actors that can enhance the experience realised, on a transnational scale, with ample recourse to digital technologies and interactive methodologies, capable of being easily adaptable to the contexts of work-based learning or mountain economy: a profile that is certainly not easy to find in the field given also the specificity of the issues addressed. The assessment of the conformity of the good practices surveyed to this ideal model was carried out by assigning graduated relevance scores to the various possible answers. The maximum score assignable for an ideal good practice was 119 points.

The good practices surveyed generally present a simpler profile than the theoretical ideal model, and thus scored lower, ranging from 40 to 52 per cent of the total possible in the best cases: for example, they were experiences that focused only on certain phases of the work cycle, or considered only one or a few of the identified strategic soft skills, or used a limited set of training methodologies and technologies.

Name of g.p.	Body holder of g.p.	Country	Region/ Province/ District	Compiling body (if different from holder)	Overall ranking of g.p.
Learning Design, Teaching, Training and Career Guidance Working Groups	ASLAM Cooperativa Sociale	Italy	Lombardy		Very good
Foresight workshops	Autonomous Provinces of Trento and Bolzano/Bozen	Italy	Trento - Bozen	-skopìa s.r.l. Anticipation Services	Good
Networked teaching: methods and technologies	Fondazione ITS INCOM		Lombardy		Good
Skillati! - Sviluppa il tuo potenziale con le soft skills (Develop your potential with soft skills)	Associazione LED - Laboratorio di Educazione al Dialogo	Italy	Trento		Very good
VET_GPS - Guiding tools for Professional Skills development in VET	Mentortec - Serviços de Apoio a Projectos Tecnológicos, S.A	Portugal	Porto		Good
PS 75/2017 - Servizi per lo sviluppo della rete della formazione e dell'orientamento permanente nell'ambito dell'apprendimento permanente (Services for the development of the lifelong learning training and guidance network)	Autonomous Region of Friuli Venezia Giulia	Italy	Friuli Venezia Giulia		Good
youngCaritas Sozialzertifikat	Caritas Austria	Italy	Tyrol		Very good

Table 22. Key information on good practices (g.p.) surveyed (source: own elaboration)

The issue with respect to which the good practices obtained the highest relevance score (expressed as a percentage value of the raw score with respect to the theoretical maximum possible) is that of the types of activities and number of soft skills considered, with 51.6%. Tables 23 and 24 below identify, for each good practice, the number and type of soft skills and activities implemented.

The good practices of Associazione LED and Caritas Austria present the highest values of soft skills considered, with 7 and 6 respectively. The soft skill most considered in the good practices surveyed is definitely *T4.3 Collaborating in teams and networks (including intercultural competence)*, present in all seven good practices, followed by *T2.4 Thinking creatively and innovatively (including futures literacy)* and *T3.2 Taking a proactive approach*, with 5 presences. At the other opposite end of the spectrum is soft skill *T6.2 Applying environmental skills and competences* (better: Applying core skills and competences for the green transition), the least considered with only two appearances, reflecting the fact that it is emerging and still not well established and taken into account, and *T4.1 Communicating with three appearances*.

Looking at the different activities carried out within the different good practices, the most widespread are those related to the Definition and classification of soft skills, the Development of teaching materials and the Elaboration of training paths and materials for the training of trainers on soft skills issues, which are present in four good practices. At the other end of the spectrum, the least considered activities are: the Development of reference systems for the validation of soft skills, not included in any good practice, as it clearly requires a systemic approach and an availability of resources for field experimentation which is not within the reach of the projects surveyed; the Elaboration of guidelines/recommendations to promote the development/use of soft skills in VET policies and activities, with only two entries. The best practices characterised by the widest range of implemented activities are those of the ITS INCOM foundation and Mentortec, with 7 activities each, and that of Caritas Austria with 6 activities.

Name of g.p.	Body holder of g.p.	T1.3 Working with digital devices and applications	T2.4 Thinking creatively and innovatively (including futures literacy)	T3.2 Taking a proactive approach	T3.3 Maintaining a positive attitude	T4.1 Communicating	T4.3 Collaborating in teams and networks (including intercultural competence)	T6.2 Applying environmental skills and competences	Total number of s.s. consideref
Learning Design, Teaching, Training and Career Guidance	ASLAM Cooperativa Sociale	●	●	●			●		4
Training and Career Guidance		●	●	●			●		
Foresight workshops	Provinces of Trento and Bolzano/Bozen	●	●	●			●		4
Networked teaching	Fondazione ITS INCOM (ICT sector)	●			●		●		3
Skillati!	Associazione LED	●	●	●	●	●	●		7
VET_GPS	Mentortec		●		●	●	●		4
PS 75/2017	Friuli Venezia Giulia Region			●	●	●	●		4
youngCaritas Sozialzertifikat	Caritas Austria		●	●	●	●	●		6
Number of g.p. considering the s.s.		4	5	5	5	4	7	2	

Table 23. Soft skills (s.s.) considered by the surveyed good practices (g.p.) (source: own elaboration)

Name of g.p.	Body holder of g.p.	1. Classification and definition of s.s.	2. Analysis of s.s. needs by the labour market
Learning Design, Teaching, Training and Career Guidance	ASLAM Cooperativa Sociale		
Foresight workshops	Provinces of Trento and Bolzano/Bozen		
Networked teaching	Fondazione ITS INCOM (ICT sector)	●	●
Skillati!	Associazione LED	●	
VET_GPS	Mentortec	●	●
PS 75/2017	Friuli Venezia Giulia Region		
youngCaritas Sozialzertifikat	Caritas Austria	●	●
Number of g.p. containing the activity		4	3

Table 24. Activities carried out in the surveyed good practices (g.p.) (source: own elaboration)

3. Success cases/good practices analysis	4. Definition of s.s. learning paths	5. Development of teaching materials	6. Development of methods for the assessment of s.s.	7. Development of reference systems for the validation of s.s.	8. Elaboration of training paths and materials for the training of trainers	9. Elaboration of guidelines/ recommendations	10. Other
●							
							●
	●	●	●		●	●	
			●		●		
	●	●	●		●	●	
●		●					
●	●	●			●		
3	3	4	3	0	4	2	1

The items related to the use of methodologies and technologies for the delivery of training activities, for the assessment of soft skills and for the training of trainers receive overall a lower score than in the previous section, with a value of 34.5% compared to the theoretical maximum score. Table 25 illustrates one of the reasons for this limited performance: in fact, relatively few good practices use advanced digital technologies - which are also the most effective, such as tools available online or specifically dedicated software/apps to be used on computers or mobile devices - for the development of tools and outputs, be they for the training of learners, for the training of trainers or for the assessment/validation of soft skills. The only positive exception concerns the presence of online tools for the evaluation of learning, present in 4 good practices, an element that should certainly be enhanced. The most commonly used training tool, both for learners and trainers, is the non-interactive digital document, e.g., a pdf document, which is certainly less effective than others, given the same content.

With regard to the training methodologies for learners that have been foreseen/applied, the most used are the Synchronous, online interactive courses/modules/lessons, present in 4 good practices, followed by the Blended courses/modules (classroom and online training) and Only classroom, face-to-face training methodologies, present in 3 good practices each.

Considering the assessment methodologies/tools that have been foreseen/applied, by far the most used one refers to self-assessment (questionnaire, check-list, etc.), present in 5 out of 7 good practices, confirming the importance of this methodology already emerged from the analysis carried out in Chapter 4.1. Much more distant come, with 2 presences each, the methodologies based on testing tools administered by trainers and those based on observation forms/lists applied by company tutors or by trainers. Even less widespread are some methodologies that are potentially very interesting but also more complex and demanding to develop and use, such as the one based on specific assessment rubrics/standards for soft skills assessment/validation (1 good practice: ASLAM), the one based on portfolio building-up and evaluation (1 good practice: Caritas Austria), the one based on case study /problem based tools (no experience found), on which further resources should be invested in possible future projects.

Technologies and product types	Training materials for learners	Training materials for trainers/ tutors	Assessment/ validation tools
Online lessons, modules, courses, tools	2	3	4
Software, apps for pc or mobile devices	2	2	2
Interactive/multimedial digital document (e.g. podcast, e-book)	2	2	3
Non-interactive digital document (pdf document)	5	3	1
Paper document	2	2	0

Table 25. Occurrence of technologies and product types in the surveyed good practices (source: own elaboration)

Lower scores, compared to the maximum potential, are registered in the other two sections of the descriptive questionnaire of the good practices: the one concerning transferability and qualifying aspects (relative score of 32.1%) and the one concerning geographical coverage and presence of institutional bodies (22.7%).

Concerning transferability, only one good practice (Caritas Austria) specifically considered the context of work-based learning, even if, in other 5 cases, the materials/tools realised can easily be used/adapted in a WBL context. On the other hand, no good practice specifically considered the context of the Alpine economy, but again 4 good practices indicate an easy adaptation of materials and tools to this specific topic.

With reference to the qualifying aspects, the one most considered by the surveyed good practices is certainly providing evidence of efficacy of the outcomes (e.g. through external evaluation, questionnaires, etc.), reported in 5 cases; gender differences were instead specifically considered only by one good practice (Caritas Austria), and again Caritas Austria is the only one to have specifically considered special educational needs; ASLAM was instead the only good practice to foresee actions and tools to favour the re-elaboration of the learning experience after its conclusion (e.g. after the return from a transnational mobility period or the conclusion of a work-based learning period); finally, none of the good practices considered the need to develop on-line repository or other tools supporting professional community of practice. On the whole, these qualifying aspects highlight the need to take more account of them in the future, as they are able to give a significant added value to new projects/interventions in this field, opening up working

perspectives that are still scarcely considered, such as the one concerning the relationship between soft skills and gender differences, which might require an articulation of the training objectives and strategies.

Lastly, with regard to geographical coverage and the presence of institutional partners, only two good practices (Autonomous Provinces of Trento and Bolzano/Bozen and Mentortec) have a transnational dimension (within EUSALP and the Erasmus+ Programme, respectively), while the others have a regional dimension.

Four good practices involved institutional, public stakeholders: in two cases with an external stakeholder role, in two others with an internal, active member of the project/partnership with operational role. They mainly played a financing role (3 cases), an information/dissemination of output/outcome of the project (2 cases) and an operational role (development of specific tasks) in one case (Autonomous Region of Friuli Venezia Giulia).

Overall, the identification of good practices revealed a picture that is still fragmented, due to the limited number of good practices detected, which can be at least partially traced back to the specificity and low visibility of the theme of soft skills, and which argues in favour of the need to continue the in-depth work begun with this survey.

6.0 Final recommendations

In this final chapter, eleven recommendations are presented, stemming from the findings of this research work, which can help to achieve the result of an increased presence and awareness of the role of soft skills in the learning processes in the VET and WBL area, and their translation into an operational key. In order to achieve this aim, the collaboration of all the actors of the VET systems is necessary. In particular, three types of actors have been identified to whom these recommendations are differentially addressed: public bodies responsible for VET policies; private or public bodies responsible for delivery of training activities in the VET area (VET providers), companies and employers' associations involved in particular in work-based learning activities. According to European Training Foundation (2019) governance in vocational education and training (VET) includes the policy areas of financing (who pays for services, and how), partnerships (who is doing what, and how, for win–win approaches) and assuring quality (making sure the service is good).

1 Explain and make transparent the importance of soft skills in learning processes.

The bibliographic analysis has confirmed that soft skills are often considered less important than technical-professional competences in learning processes, whereas in the labour market they have become increasingly important with the tumultuous advent of the new transformation and innovation processes connected to Industry 4.0 and Industry 5.0; the relevance of soft skills grows proportionally with the level of competence of the different professional profiles (e.g. the EQF level of reference). It therefore seems necessary to realign training policies with the professional needs of companies, especially the most dynamic and innovative ones. In some cases it is simply a matter of making explicit training objectives

and actions that are already considered but left 'implicit', without being raised to a level of awareness on the part of both trainers and learners. In other cases, it is a question of inserting soft skills from scratch among the training objectives of the WBL and non-WBL learning paths, integrating them with the development of technical-professional competences. This lack of account appears to be at least partially justified by a number of actual difficulties: soft skills are a poorly consolidated theme in the training field; they have not been unambiguously classified and defined in a widely recognised manner; the outcome of soft skills is in most cases intangible, changeable, and depends on many factors; therefore, they are not easy to assess, etc. Thus, the first recommendation concerns the need to bring to the surface and make evident and transparent the contribution that soft skills can make to learning processes. This involves working through all phases of the VET cycle: from the regulatory aspects, to training design, content development and delivery, and evaluation. This requires the collaboration of all actors in the VET system, particularly in the field of work-based learning.

- *Public bodies responsible for VET policies*: the contribution of the public bodies responsible for VET policies at different levels (national, regional, provincial, local according to the different national models of assignment of competences in the field of VET) appears certainly fundamental for a greater visibility and consideration of soft skills in the learning pathways. In fact, these organisations have the possibility to direct - through methodological setting documents, technical regulations, calls and tenders related to the realisation of training activities in the VET and WBL fields - the design, realisation and evaluation activities of training activities in the VET area towards a greater consideration and valorisation of the role of soft skills in the VET field. Examples of possible operational actions:

- Prepare a methodological approach document, using the results of this report, to define a framework and promote the valorisation of soft skills in the VET area;

- include, in notices and tenders relating to training activities in the VET and WBL area, specific indications concerning the specification of training objectives relating to soft skills as well as technical and professional competences;

- include the detection of the soft skills most required by the labour market in observatories and surveys on the professional needs of a territory.

- *VET providers*: VET providers are competent for the design and implementation of training activities, both in the WBL and non-WBL area. They are therefore responsible for the operational enhancement of soft skills in learning

processes. Examples of possible operational actions:

- include the identification of the soft skills most relevant to a sector or job profile in the operational procedures for designing VET and WBL training activities;

- promote projects (e.g. Erasmus Plus) and innovative training courses aimed at testing the effectiveness of soft skills in learning processes;

- also take soft skills into account in transnational training mobility projects.

- *Companies/employers' associations*: In the WBL, the training role of companies is brought to the forefront. It is therefore necessary for workers (e.g. company tutors, mentors, supervisors, etc.) and representatives of employers' associations who are in contact with VET systems and providers to be able to highlight the role of soft skills in the professional background of the various profiles, to identify the training needs that are most in demand and not yet adequately met by the VET systems, and to organise learning pathways in the WBL context taking into account the development of soft skills. Examples of possible operational actions:

  - carry out a survey of professional and training needs in the company, also taking into account soft skills and not only technical and professional skills;

  - sensitise company mentors and employers' associations' representatives on the importance of soft skills in the professional background of workers and the necessity to develop these skills together with technical-professional ones.

2 Use a common framework for defining and classifying soft skills.

One of the main problems encountered during the study is the lack of a common reference framework for defining and classifying soft skills, which often makes it difficult to compare the results of projects and analyses from different sources. In particular, in a perspective of learner mobility and transnational and transregional recognition of acquired competences, calling soft skills by the same name and giving them the same meanings is the first step towards making soft skills transparent. In this sense, an analysis of the literature has made it possible to verify the presence of various proposals for classifying soft skills, but none has yet become widely established. Among the frameworks analysed, the use of the ESCO classification - European Skills, Competences, Qualifications and Occupations, area T - Transversal skills and competences (henceforth ESCO-T) is proposed, for the following reasons: it is an expression of the European Union and therefore gua-

rantees a transnational approach and validity; it is available in 27 languages and therefore allows language barriers to be overcome, being certain of referring to the same competence; it is a constantly updated classification system and in this sense already includes soft skills of recent attention, such as those linked to sustainability. Certainly, much still remains to be done: the publication, in recent years, of four European frameworks related to the field of soft skills (DigComp, LifeComp, EntreComp, GreenComp), makes it necessary to make an effort of homogenisation and alignment between ESCO-T and the four frameworks (as partially attempted in this work), in order to enhance the effectiveness and usability of these tools.

- *Public bodies responsible for VET policies*: At the European Commission level, the time appears ripe for an overall revision of the classifications and the four frameworks developed in recent years, in order to homogenise descriptive models, nomenclatures, designations and definitions. For example, as far as ESCO-T is concerned, it is proposed to change the denomination and description of the current skill T6.2 Applying environmental skills and competences, which is rather reductive, using the broader and more comprehensive denomination Applying core skills and competencies for the green transition, that can be placed in the broader concept of a sustainability literacy. As far as national and regional public bodies responsible for VET policies are concerned, they should use the ESCO-T classification of soft skills in the definition of training policies, so as to stimulate all VET actors to use this classification. Examples of possible operational actions:

- (at European level) to revise the ESCO-T classification in order to constantly update it to the evolving European conceptual and methodological framework on soft skills;

- (at European level) reviewing the four European soft skills frameworks, homogenising the skills description systems used and integrating them with the ESCO-T classification;

- use ESCO-T to define target soft skills in calls and tenders related to VET activities;

- use ESCO-T as a reference check-list in labour market training and professional needs analyses;

- develop repertoires of soft skills, to be flanked by those related to technical-professional competences, referring to the ESCO-T classification, in order to facilitate recognition, validation and certification activities.

- *VET providers: VET providers* are called upon to use the ESCO soft skills classification in the different operational phases of the VET cycle, from design to learning evaluation. Examples of possible operational actions:

- use the ESCO-T classification and European frameworks in VET training design;

- *Companies/employers' associations*: the business world should also use ESCO-T to analyse and define training and professional needs in companies. Examples of possible operational actions

- use ESCO-T as a check-list in training and professional needs analysis in the company and for company human resources valorisation and development policies.

3 Identifying soft skills in addition to the basic cluster, which are important for an economic sector and/or a job profile

The present work made it possible to identify a limited cluster of seven soft skills considered to be the most significant, on the basis of an exhaustive literature review, to support learning processes in WBL, to make transnational training mobility experiences more effective, to promote the development of the Alpine economy. Each economic sector and/or professional profile, however, presents its own specificities which must be taken into account in the definition of learning pathways: if the seven soft skills identified can be considered a common base, widely shared in all the contexts considered, it appears necessary to define broader profiles of soft skills for each professional figure or sector considered, adding other soft skills to the training targets, again using ESCO-T, which have been identified taking into account the specific needs of the economic or professional sector considered. The integration between the seven soft skills identified by this work and the additional ones, specific to the professional sector/profile, will make the learners' professional preparation both richer and more complete. As VET-GPS (n.d.-b) stated, skills matching is one of the most critical aspects when planning and providing initial training to young people, aiming at preparing them for life and the labour market. In the past years, the mismatch between trainees' soft skills and the labour market needs, is being more and more referred by employers as a gap that can be filled through common work and cooperation between all stakeholders.

- *Public bodies responsible for VET policies*: in order to encourage a greater consideration of soft skills in learning processes, VET policy bodies could develop

broader soft skills clusters for the main economic sectors and occupational profiles within their territories of reference, so as to help other VET actors to customise training projects. Examples of possible operational actions:

- to define more comprehensive soft skills profiles for the most representative economic sectors and professions in the regional economy;

- to promote discussion technical tables between VET providers, companies/ employers' associations and trade organisations, in order to create a shared mapping of the most significant soft skills for the most representative economic sectors in each area;

- to define a number and minimum set of soft skills that VET providers should include in their training design;

- to explicitly include the most relevant soft skills in the curricula of professional figures (e.g., in the initial training, in VET, etc.).

- *VET providers: VET providers* should use, where possible and useful, broader sector soft skills profiles for training design. Examples of possible operational actions:

- to design training courses in the VET area, particularly in the WBL area, explicitly using soft skills profiles adapted to the needs of a specific sector and/or profession.

- *Companies/employers' associations*: Companies involved in WBL activities should also pay special attention to identifying the clusters of soft skills required of each professional figure. Examples of possible operational actions:

- to promote an analysis, at a supra-company level, of the soft skills needs of a specific economic sector in order to map the most significant ones;

- to carry out an analysis of soft skills clusters related to the most significant job profiles in a company.

4 Training of teachers, trainers and tutors/supervisors

According to OECD (2021) training programmes for teachers in VET programmes should reflect the fact that employees in today's workplaces need not just occupation-specific and technical skills but also stronger basic, digital and soft skills. VET teachers need to facilitate the development of these skills among their students but not all of them know how to effectively teach such skills in a VET setting. With the increasing online delivery of VET, teachers also need to have stronger digital skills. Besides technical knowledge, they need to have pedagogical knowledge too, but often have limited pedagogical preparation.

A changing environment for teaching and learning also requires VET teachers to have a wide range of soft skills including basic, digital, problem-solving skills. New technologies such as virtual/augmented reality, robotics and simulators have the potential to foster innovation in VET teaching and learning. These technologies are flexible, cost-effective and safe ways to promote learning. They help students develop technical skills, but also soft and digital skills. So, it's also needed to foster the capacity of VET teachers to use innovative pedagogical approaches and new technologies, applying them both to technical, professional instruction and to the development of soft skills.

On the other hand, it's well known that the company tutors/supervisors assume a fundamental role in the development of work-based learning in companies and organizations, and must have appropriate technical-professional, pedagogical and social skills, including the ability to transfer and develop soft skills needed in each specific economic sector or job. The development of soft skills in work-based learning, if it also includes the contextual training of company tutors/supervisors, also provides an opportunity to improve the competitiveness of host companies by better focusing on the role of soft skills in work processes. This is particularly true in relation to some important ongoing transformation/innovation processes and the related emerging soft skills (e.g. core green skills, futures literacy) in order to avoid "cognitive" dissonances between companies and VET providers and, in the company, between learners and tutors/supervisors. In essence, it is necessary to align the competences related to soft skills enhancement between VET providers and companies, promoting VET teachers' and tutors' ability in guiding students in the process of activation of key soft skills during their work-based learning experience.

- *Public bodies responsible for VET policies*: firstly, there is a need for internal training updates, of officials and decision makers, aimed at highlighting the growing importance that soft skills have in the learning processes in the VET area (and WBL in particular) and at defining policies to support the development of these skills. Secondly, they should work to provide VET systems

(training providers and companies) with resources and opportunities to train the different professional figures involved (leaders, managers, designers, teachers/trainers, tutors, supervisors). Examples of possible operational actions:

- carrying out internal training activities aimed at functionaries, managers and decision-makers on the growing importance of soft skills in the VET area, also in support of technological and organisational innovation processes in companies, and especially with reference to the so-called emerging soft skills (e.g. green skills, sustainability skills, futures literacy);

- realisation of training programmes and/or provision of resources for the training and professional updating of the different figures operating in the VET and WBL systems; it is important that these training and professional updating opportunities concern both VET providers' operators and workers of enterprises involved in WBL activities, building opportunities for dialogue, confrontation and collaboration.

- *VET providers: VET providers* are called to update the various professionals involved in the VET cycle, in particular on certain priority topics such as: the design of soft skills learning processes; methodologies for the enhancement and evaluation of soft skills; the use of new technologies including virtual reality, simulation, game-based learning to improve the effectiveness of soft skills learning. Examples of possible operational actions:

- implementation of training and refresher courses for its operators on the above-mentioned topics;

- *Companies/employers' associations*: as part of a broader professional development and reskilling programme, companies should pay more attention to the role of soft skills in internal job profiles and the consequent strengthening measures. For this to happen, it is necessary to initiate training programmes aimed both at developing these skills and at enhancing the ability of company tutors, supervisors and mentors to transfer these soft skills to trainees within the framework of work-based learning activities. Examples of possible operational actions:

- realisation of programmes for the development and empowerment of workers' soft skills, considering the different economic sectors and job profiles involved, with a focus on the emerging soft skills;

- implementation of training and refresher courses, for workers and company representatives involved in WBL activities (company tutors, supervisors,

mentors), on the methodologies for the transfer to trainees and the development of the soft skills considered most significant and on the methodologies for the evaluation of these skills.

5 Pre-WBL/apprenticeship and pre-mobility programmes.

The fifth recommendation is in the framework of an integrated model of learning activities to be carried out before, during and after WBL experiences (apprenticeship but not only) and/or training mobility.

In such an integrated model, according to ILO (2020), apprenticeship and other similar work-based learning programmes - but the following considerations can equally apply to transnational mobility activities - can be demanding, both intellectually challenging and requiring strong interpersonal skills. To overcome these challenges, a few countries have initiated the development of different types of pre-apprenticeship programmes. These programmes, lasting from a few weeks to 12 months, aim to provide young people with the necessary preparation that will facilitate their access to a regular apprenticeship/WBL programme.

To design successful pre-apprenticeship/WBL programmes, it is necessary (L&W, n.d. - a): to respond to local employment and skills needs, that's to say to work with employers and other relevant local partners to ensure that they are tailored to meet the needs of the labour market, enabling young people to develop specific skills that local employers are looking for; to work to a clear quality assurance framework, such as the European Commission Quality Framework for Traineeships. L&W (n.d.-a) provides many examples of useful self-assessment and planning tools for the development of pre-apprenticeship programmes. As suggested by L&W (n.d.-b), pre-apprenticeship - but also pre-WBL and pre-mobility programmes - are particularly suited to the development of basic, soft and employability skills, giving the opportunity to undertake an initial assessment of young people's skills and providing them with opportunities to develop lacking skills using a wide range of innovative and engaging training methods such as experiential learning, problem- and project-based learning, embedded delivery of soft and technical or employability skills learning, blended learning, etc.

- *Public bodies responsible for VET policies*: should ensure the presence of pre-apprenticeship, pre-WBL or pre-transnational mobility programmes in the legislation regulating these activities, giving indications relating to the presence of soft skills in these programmes. Examples of possible operational actions:

- include pre-apprenticeship, pre-WBL or pre-transnational mobility programmes in the methodological guidelines, calls and tenders for such activities;

- provide a specific space for soft and employability skills in such programmes;

- to involve VET providers, companies/employers' associations, trade unions and other relevant local stakeholders in defining the soft skills target and the contents of such programmes.

- *VET providers*: have the task of organising and delivering the pre-apprenticeship, pre-WBL or pre-mobility programmes, ensuring the link with the companies that will subsequently host the young trainees. Examples of possible operational actions:

- design of pre-apprenticeship, pre-WBL or pre-mobility programmes, with an emphasis on soft and employability skills;

- coordination and integration between pre-apprenticeship, pre-WBL or pre-mobility programmes and subsequent in-company learning activities.

- *Companies/employers' associations*: participate in the definition phase of the soft skills needs of young trainees and in the design of pre-apprenticeship, pre-WBL or pre-mobility programmes. Examples of possible operational actions:

- participation in joint tables for the identification of target soft skills and the design of training programmes;

- definition of integration between pre-WBL training and skills development during WBL.

6 Soft skills development methodologies

Although the methodologies for the development of soft skills are not the specific subject of this paper and would require a far broader analysis, it appears important to emphasise some general aspects that complement the reflections on assessment in Recommendation No. 8 below.

Generally soft skills development can be performed under different forms and with various tools. According to Cinque (2016) different teaching strategies can be divided into three groups:

- expository methodologies, such as lesson, seminar, conference, demonstration;
- guided methodologies, such as discussion, problem-based learning, project-based learning (internal project works, external cooperation projects etc.), challenge-based learning, service-based learning, case study, simulation, mentoring;
- active methodologies, such as competition, brainstorming, role play, business game, visits, outdoor training, coaching, internship and on the job training, learning based on practical activities.

Different soft skills and different learning contexts need different teaching strategies or, preferably, the integration of multiple strategies. Soft skill learning is 'meaningful,' since it should be a wilful, intentional, active, conscious, constructive, and socially mediated practice that includes reciprocal intention, action and reflection activities.

Embedded delivery of hard and soft skills is also important: where possible training should combine, rather than separate, soft skills development and other technical or employability skills development, as this helps young people to see the real-life value of these types of skills. So it is necessary to consider ways to take an integrative approach to developing soft skills, which incorporates elements of soft skills into wider learning, instead of creating modules that are specific to soft skills.

According to Forbes Human Resources Council (2020), learning soft skills is important, but only part of the learning equation: trainees (and employees too) must be able to apply those skills within the context of their job. The process of constant reinforcement through quick reference, microlearning in the flow of work turns soft skills into real capabilities that help trainees and employees perform at their highest level.

- *Public bodies responsible for VET policies*: should promote the identification and development of effective methodologies, providing methodological guidance to practitioners. Examples of possible operational actions:

- promotion of experimental actions for the development of effective teaching methodologies for learning soft skills, in particular emerging ones;

- development of methodological guidelines, also on the basis of the results of the experimental actions mentioned in the previous point, for learning soft skills.

- *VET providers*: participate in experimentation and development of teaching methods appropriate to the different soft skills and apply these methodologies in the delivery of training activities. Examples of possible operational actions

- participation in innovation projects, possibly at transnational level, for the development of new methodologies and teaching strategies and the development of guidelines and guidebooks for VET practitioners;

- teacher training on the most effective methodologies for the development of soft skills;

- application of teaching methodologies, with an emphasis on active methodologies and integrated strategies for the development of soft and hard skills.

- *Companies/employers' associations*: collaborate with VET providers for the development of soft skills on the job. They are essential for demonstrating in the work context the effective integration of hard and soft skills and for the implementation of periodical reinforcement actions on the job. This obviously requires a particular awareness and competence of the company tutors. Examples of possible operational actions:

- training of company tutors on the integration of hard and soft skills and on the implementation of reinforcement actions on the job;

- identification of a set of typical work situations for each professional profile, in order to let trainees experience the soft skills integrated application on the job;

- support to trainees' documentation of learning progress during the experience, e.g. through logs of hours, logs of accomplishments, and thoughtful, systematic reflections exercises.

7 After-WBL/apprenticeship and after-mobility activities.

The literature reviewed has shown that the activities which take place after the conclusion of the WBL and training mobility experiences are one of the weakest and least considered aspects of the whole cycle of activities, even though they play a non-secondary role in guaranteeing the effectiveness and overall training success of these experiences. The purpose is to consolidate the results of the learning processes, fostering a reflection on the experiences realised, allowing the evaluation of the learning pathway and of the WBL/mobility programmes, supporting the definition of objectives for further professional development and/or insertion in the labour market.

According to Tennesse Department of Education (2016) final assessment and follow-up help WBL Coordinators, school and VET districts, and industry partners build lasting relationships and quality programmes. In particular programme evaluations should provide feedback from students, employers and VET personnel to provide feedback on the processes and logistics that can make the programme successful.

- *Public bodies responsible for VET policies*: should foresee the presence of after WBL/apprwenticeship and after mobility programmes in the notices and calls for proposals and in the methodological documents related to WBL and mobility activities, giving indications concerning the activities to be carried out such as: recall and embedding of acquired skills, evaluation of learning and activity programmes, reflection activities and re-elaboration of the experiences made. Examples of possible operational actions:

- corporation of indications concerning the implementation of post-WBL and post-mobility activities in the notices and calls for proposals for these actions;

- development of guidelines and methodological notes on post-WBL and post-mobility activities.

- *VET providers*: are in charge of the organisation and implementation of a programme of post-WBL and post-mobility activities. Examples of possible operational actions:

- implementation of actions to recall and embed the skills developed by trainees (e.g., through reflection and self-assessment actions);

- final and integrated evaluation of learning (e.g., according to Castoldi's [2016] trifocal model of skills evaluation, which envisages the integration of three different points of view: the learner's subjective one, the trainer's objective

one, the companies' intersubjective one - see Recommendation no. 8),

- definition of further professional and training objectives of the trainee;
- overall assessment of the effectiveness of the implemented programme and its possible revision with a view to continuous improvement.

- *Companies/employers' associations*: participate in learning and WBL/mobility programme evaluation activities. Examples of possible operational actions:

- participation in the final summative evaluation of trainees' learning;
- participation in the overall evaluation of WBL/mobility programmes and in their improvement revision.

8 Methodologies for soft skills assessment.

Chapter 4 presented in depth the different methodologies available for the assessment of learning and the contribution that European frameworks can make. These analyses showed that the assessment of soft skills can be a critical factor, as it requires the use of unconventional and non-standardised methodologies, in which the qualitative dimension prevails over the quantitative one. According to Tennesse Department of Education (2016), while assessment is generally thought of as a culminating experience, ongoing assessments can be great opportunities to help the trainee learn to take critical feedback and adjust behavior.

The adoption of the above-mentioned Castoldi's trifocal skills assessment model can provide a useful methodological framework. Self-assessment is a good learning opportunity because it not only focuses trainees on the content being assessed, but also on the process of self-evaluation, which is, in itself, a critical soft skill. Debrief of assessment by employer and/or trainer can provide an additional opportunity: learners will be evaluated by teachers/trainers and employers, based on a rubric or other assessment tools. Having the students take time to understand and integrate the teachers' and employers' perceptions of their performance is a rich learning experience.

Portfolio - a collection of work that a learner has collected, selected, organized, reflected upon, and presented to show understanding and growth over time - can be a useful, powerful, although challenging tool for summatory assessment, used to document the attainment of WBL/mobility learning objectives and can be scored with a holistic rubric. Throughout their WBL/mobility experience, stu-

dents will develop work products, collect employer evaluations, produce original research, write reflections, and give presentations. A selection of these outputs will constitute the portfolio, alongside career development materials and documentation of progress.

- *Public bodies responsible for VET policies*:have the task of defining a methodological framework for the assessment of soft skills, also taking into account the goals related to the validation/certification of skills. Examples of possible operational actions:

- development of guidelines and manuals for the assessment of soft skills, taking into account the presence or absence of systems for their validation/certification;

- participation in the evaluation of WBL/mobility programmes from a review and continuous improvement perspective.

- *VET providers*: are generally in charge of both learning and programme evaluation actions. Examples of possible operational actions

- testing and implementation of effective methodologies for the assessment of various soft skills;

- inclusion of soft skills in the aspects to be assessed at the end of WBL/mobility activity programmes.

- *Companies/employers' associations*: collaborate with VET providers for the assessment of soft skills on the job. Examples of possible operational actions:

- carrying out on-the-job assessment activities using rubrics or other assessment tools;

- participation in activities to evaluate the effectiveness of WBL/mobility intervention programmes.

9 Recognition, validation and certification of soft skills.

The issue of recognition, validation and certification of soft skills, especially those developed in non-formal and informal fields, is becoming a current topic for all educative and training institutions, even if is still largely an open issue, mainly due to the lack of a widely recognised classification and definition framework and to the difficulty of operationalizing soft skills, declining indicators to recognize different levels of expertise, identifying tested tasks useful to assess the different soft skill levels.

The four European soft skills frameworks, when combined with the ESCO-T classification, can offer a starting point on which to build a broader European certification framework. The reference model can be that of basic digital competences: the European DigComp framework is in fact at least partially referenced in the certification system developed by ICDL, the international organisation dedicated to raising digital competence standards in the workforce, education and society. Their certification programmes, delivered through an active network in more than 100 countries, enable individuals and organisations to assess, build and certify their competence in the use of computers and digital tools to the globally-recognised ICDL standard. Some of the ICDL certifications can be related to the DigComp skills, although the picture does not yet appear complete and perfectly aligned.

A further research effort seems necessary at this point in time in order to extend this model to other soft skills and to progressively build a real European soft skills certification system that can promote the recognition of the importance of soft skills in learning processes and in the labour market.

- *Public bodies responsible for VET policies*: their task is above all to foster research and development of wider systems for the recognition, validation and certification of soft skills. Examples of possible operational actions:

- (at European level) implementation of greater integration and alignment between ESCO-T, European soft skills frameworks and competence certification systems, in order to standardise definitions, contents, training objectives and to extend the list of certifiable soft skills to a European dimension;

- development of research and testing programmes for soft skills certification models, ideally on a transnational scale;

- promoting the use of existing certification standards, particularly in the digital field (e.g. ICDL), in VET and transnational learning mobility activities.

- *VET providers*: participate in the development and testing of standards for the certification of soft skills, promoting the use of already existing systems (e.g. ICDL). Examples of possible operational actions:

- participation in European (e.g. Erasmus+ programme), national or regional projects for the development of soft skills certification standards, syllabuses and curricula;

- use of existing certification standards (e.g. ICDL) and promotion of their use among trainees.

- *Companies/employers' associations*: participate in the development of standards for the certification of soft skills, especially with regard to the operationalisation of soft skills in the work place and the identification of tasks and cases illustrative of the different levels of mastery of the skill. Examples of possible operational actions:

- Participation in European (e.g. Erasmus+ programme) national or regional projects, and/or working groups for the development of standards, tasks and relevant cases for the certification of soft skills.

10 Valorisation of the role of digital learning and emerging technologies in the development of soft skills.

Digital learning and emerging technologies are offering new tools to teach soft skills in powerful ways; gamification, virtual and augmented reality, and simulations are just a few, increasingly closely connected.

Organizations and VET providers can use gamification and **game-based learning** (GBL)to give learners a time constraint and approach a situation by thinking on their feet. GBL is a concept that is structured around a learning process that uses as the main pedagogical tool a specific game (in digital or analogue form) which helps to arise and develop skills. This approach mimics the real world, where employees need to react quickly, for instance during conversations and customer interactions. The GBL methodology has a main advantage over classical education, which is that practice precedes theory and, in this assumption, the learning process is developed in order to solve situational problems, whose emergence is controlled by the training environment.

Augmented Reality (AR) and **Virtual Reality** (VR) are immersive technologies that help students explore all sorts of content in a more lifelike way, connect

learning to real-world situations, and achieve what's generally impossible in classrooms. Until recently, AR/VR work in the enterprise has focused on job skills simulation training but, according to PwC (2020), VR-learning, using virtual reality to train employees on various skills, is more effective than classroom and e-learn training modalities at teaching soft skills concepts too. After an on-field test, the v-learners were up to 275% more confident to act on what they learned after training (- a 40% improvement over classroom and 35% improvement over e-learn). V-learners were up to four times more focused than e-learners. They completed training on average four times faster than classroom training and 1,5 times faster than e-learn. V-learners were 3,75 times more emotionally connected to the content than classroom learners and 2,3 times more connected than e-learners. On top of those benefits, v-learn was estimated to be more cost-effective than classroom or e-learning modalities when delivered at scale.

Scenario-based learning, also called branching simulation or branching scenarios, is another method strictly related to Virtual Reality. Branching scenarios are likened to the "choose your own adventure" books, popular in years past. As the participant makes decisions based on their knowledge of the subject, the scenario branches off to a new direction – making every interaction fun and engaging. This simulation format allows for an in-depth knowledge check for the learner and an opportunity to learn more about the specific skill they are practicing. This method is especially helpful with soft skills training. Subjects like emotional intelligence, critical thinking, complex problem solving, and more can be practiced in a real-life way through branching scenarios. Adding in **Artificial Intelligence** (AI) can take the dynamic VR experience to the next level. Instead of having multiple choice answers to the scenario, AI allows the learner to respond in the best way they know how without the confines of specific answers, because in real life, we don't have multiple choice answers in decision-making situations.

Lastly, **Digital badges** have recently emerged as an engaging technique for tracking and recognizing learner progress in the development of specific nonacademic skills. Digital badges are an indicator of accomplishment, skill, quality or interest that can be displayed, accessed and verified online. Quite simply, they're visual emblems of achievement in digital format. Digital badges are earned in a variety of ways, for a variety of achievement levels, from 'low stakes' event participation to 'high stakes' achievements, such as successfully completing a collaborative project. They're easy to produce, manage and share. Through gamification, badges increase learner engagement and boost participation in training and HR development programmes. Besides, digital badges demonstrate superior value over traditional credentials in the granular details of achievements, thus being in line with the European micro-credential perspective.

In 2010 the Mozilla Foundation established the Digital Open Badges concept as a virtual incarnation of physical counterparts such as a paper certificate or a youth organisation merit badge. Digital Open Badges offer embedded, verifiable, metadata containing information such as the issuer and award criteria. Open Badges can be used to reward learning, participation or achievement. They can be stored in various online environments, including the Mozilla 'Backpack' and social media platforms. Open Badges have been used to evidence informal learning, professional development, community and voluntary work. According to Loughlin et al. (2016) digital badges are particularly suitable for soft skills recognition, in a micro-credentialing perspective, even if the definition of assessment criteria and requirements for supporting evidence for soft skills is still an open question that needs further research.

The further development of these technologies and methodologies and their dissemination throughout the VET system obviously requires the investment of considerable resources, which are beyond the reach of a single actor. Therefore, a system action, possibly on a transnational scale, seems necessary in order to provide VET systems with the tools to test these new opportunities on a large scale.

- *Public bodies responsible for VET policies*: hanno il compito di promuovere la sperimentazione di nuove modalità di applicazione delle tecnologie digitali emergenti all'apprendimento delle soft skills, rivolte sia ai sistemi VET che alle imprese. Examples of possible operational actions:

- (at European level) inclusion of the application of emerging digital technologies among the priorities for supporting VET experimentation projects;

- development of research and testing programmes for new soft skills learning models, based on emerging digital technologies, preferably on a transnational scale;

- *VET providers*: participate operationally in the development of new soft skills learning models based on emerging digital technologies. Examples of possible operational actions:

- participation in European (e.g. Erasmus+ programme), national or regional projects for the development and testing of new soft skills learning models based on emerging digital technologies;

- *Companies/employers' associations*: collaborate with VET systems for the development and testing of new soft skills learning models, based on emerging digital technologies, to be used also for the training of employees.

Examples of possible operational actions:

- participation in European (e.g. Erasmus+ Programme), national or regional projects for the development and testing of new learning models of soft skills, based on emerging digital technologies, to be used also for in-company training.

11 Promoting the dissemination of emerging soft skills.

The last recommendation concerns the need to promote in particular the diffusion of certain emerging soft skills, on which the interest of the academic and business worlds is focusing, due to their importance in connection with the great challenges of the 21st century, in particular the core skills for **core skills for the green transition** e la **futures literacy**.

According to ILO (2019) changes in the Earth's climate and ecosystems are starting to have dramatic impacts on economies and societies. The transition to environmental sustainability (the so called "green transition") continues to affect existing occupations, where reskilling or upskilling is needed, and – more rarely – to create new green occupations. New occupations tend to emerge at higher skill levels, whereas lower-skilled occupations tend to require just more environmental awareness or simple adaptations to work processes. Skills for green jobs can be very specific to a particular occupation or a sector, not necessarily requiring completely new training programmes; they can, however, also include more soft, core skills, reflecting the fact that there may be green alternatives for all kinds of processes, products and services. Core skills, including environmental awareness, should be mainstreamed in TVET systems and earlier childhood and youth training, in lifelong learning, including workplace skills training. A significant factor is that many initiatives are still ad hoc by nature and ongoing. There are cases where specific initiatives have led to systematic changes, but many are still restricted to particular projects, sectors, subnational areas or even companies. So there's a strong need to define common training and education strategies: the recent GreenComp European framework can offer a solid basis for developing effective training strategies not so much in the field of green skills related to specific economic sectors or professions, but in the development of a common 'green literacy' – we suggest the naming of Core skills and competencies for green transition, to be considered as a new soft skill (already considered but with another, not satisfactory, naming in ESCO-T) in which environmental sustainability is integrated into the broader concept of sustainability, which also covers social and economic aspects. All this must, of course, be translated into educational and training curricula adapted to the different learning and professional levels.

Futures literacy, as it is called by UNESCO, is the skill that allows people to better understand the role of the future in what they see and do. Being futures literate empowers the imagination, enhances our ability to prepare, recover and invent as changes occur. According to Balcom Raleigh (2020), futures literacy calls for: a) paying attention/being conscious when we use futures; b) being reflective about the futures we use (our ideas, images, conceptions and sentiments about the future); and c) being able to switch between different types of futures (e.g., probable, desirable, strange, transformative, etc.) for different purposes (e.g., preparation, planning or making sense of emergence). Futures literacy enables persons to become aware of the sources of our hopes and fears, and improves their ability to harness the power of images of the future, to enable them to more fully appreciate the diversity of both the world around us and the choices they make.

These two "new" soft skills were chosen because they are a paradigm of the fact that the soft skills system also evolves continuously and must therefore be constantly reviewed and updated. It is obviously necessary to build learning pathways for these skills, to be included within the VET system, also taking into account the context of work-based learning that requires considering not only a classroom learning setting but also an on-the-job learning setting.

- *Public bodies responsible for VET policies*: considerato lo stato ancora embrionale di sistemi e metodologie consolidati per l'apprendimento delle soft skills emergenti, il focus deve essere posto sulla traduzione di tali skills in percorsi e risorse per l'apprendimento adeguati ai diversi contesti di applicazione (VET, WBL, ecc.). Examples of possible operational actions:

- (at European level) inclusion of the emerging soft skills among the priorities for supporting European VET experimentation projects;

- development of research and testing programmes for emerging soft skills learning models adapted to VET systems;

- inclusion in VET notices and calls for tenders of indications concerning the presence of modules dedicated to Core skills for green transition and Futures literacy in learning pathways, including WBL.

- *VET providers*: have the task of operatively developing methodologies, contents and teaching resources for learning the emerging soft skills. Examples of possible operational actions:

- participation in European (e.g., Erasmus+ Programme), national or regional projects for the development and testing of new learning pathways of emerging soft skills;

- inclusion of modules related to emerging soft skills in VET activities.

- *Companies/employers' associations*: The development of emerging soft skills can also contribute to the development of corporate competitiveness and sustainability. It is therefore necessary to actively participate in the development of learning processes for emerging soft skills, with particular attention to work-based learning and the identification of possible fields of application of these new skills in corporate professional figures. Examples of possible operational actions:

- evaluation of the impact of emerging soft skills on the professional profiles present in a company or in an economic sector;

- development of resources, tasks and example cases for the development of emerging soft skills in WBL.

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