



SSPICEIT!

Sustainability Skills Program for International Catering
operators and Entrepreneurs through Integrated Training

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Sustainability Skills Program for International Catering operators and Entrepreneurs through Integrated Training

WP2_Game-based skill assessment and career guidance tool

Task2.1_Research & Review

A2.1.3_Comparative analysis report

Deliverable: Report

WP leader: Institute of Entrepreneurship Development

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Contents

A few words about SSPICE IT project.....	3
Work Package 2 Game-based skill assessment and career guidance tool.....	4
TASK 2.1 RESEARCH & REVIEW	4
Activity 1 Initial mapping of emerging/required skills in the food/catering sector	5
Activity 2 Analysis of skills acquired in the initial VET courses in the catering sector	36
Activity 3 Comparison of findings	60
Activity 4 Matrix development	62
Conclusions and remarks	66
Annex	72



A few words about SSPICE IT project

Sustainability, understood as economic, social and environmental sustainability, is at the heart of European strategies and policies, as well as the UN 2030 Agenda for Sustainable Development. All major production sectors are adapting, in terms of transforming production processes, organisational systems and more generally business models. Such radical transformations obviously also require operators and professional figures with greater green, digital and transversal skills. All the territories involved in the project are committed in implementing an inclusive green and digital transformation and the updating of vocational training paths is a fundamental element in the implementation of this strategy, as envisaged in the various National Recovery and Resilience Plans.

The food and catering sector is facing radical changes in Europe, with an exponential need of workers with sustainability and digital skills. In terms of the above mentioned changes and needs, **SSPICE IT!** project intends to:

- increase VET teachers and learners' awareness of the relevance of sustainability,
- update VET curricula by integrating green and digital skills,
- enhance the capacity to assess these skills,
- create a long-term partnership between VET providers, research centres, businesses and public authorities at different levels.

The **project consortium**, representing the world of vocational training, research and business of 6 different EU countries will:

- develop a training programme on sustainability to develop green and digital skills of future operators/entrepreneurs of the food/catering sector;
- develop a game-based career guidance and assessment tool to assess green, digital and entrepreneurship skills;
- create a community of practices involving key stakeholders on the food/catering sector.

The **expected outcomes** of the project will be:

- Increased level of green, digital and entrepreneurship skills of VET learners in the food/catering sector
- Increased level of awareness and green competences of VET teachers
- Enhanced dialogue and cooperation among VET centres and key stakeholders of the food/catering sector
- Increased attractiveness and responsiveness of VET curricula in the food/catering sector to the labour market needs

Work Package 2 Game-based skill assessment and career guidance tool

The objective of WP2 is to facilitate the evaluation and recognition of the competences acquired by the learners during the training programme and other project activities through the use of an innovative evaluation tool, which allows a more comprehensive evaluation of the skills acquired through the use of games and simulated scenarios. Through the use of gamification techniques, scenarios will be recreated in which learners must solve "challenges" that arise in real work contexts and that will thus allow the assessment of learners' skills and competences in solving real problems.

The main expected results of WP2 are:

- Provision and use of an innovative, game-based assessment tool that facilitates self-assessment, the assessment of pre- and post-training on green, digital and entrepreneurial competences, their recognition and validation;
- Increased awareness of teachers and learners concerning the new skills required in the food and catering sector and more generally, in the labour market;
- Increased capacity for assessment and self-assessment of green, digital and entrepreneurial skills;
- Increased transparency and recognition of acquired skills.

The Work Package is divided into the following tasks for its accomplishment:

TASK 2.1 RESEARCH & REVIEW

TASK 2.2 BETA version of the app

TASK 2.3 Experimentation and PEER REVIEW

TASK 2.4 Final version and publication

TASK 2.1 RESEARCH & REVIEW

Therefore, the Work Package is launched with the activity of RESEARCH & REVIEW for which it is needed to map both the skills emerging and the required skills in the catering and restaurant sector (with particular reference to sustainability, digitalization and soft skills) and an analysis of the main green, digital and entrepreneurial knowledge and skills currently acquired in VET courses in the food and catering sector.

Survey through questionnaires and mapping activities were designed and conducted by partners for the accomplishment of the task. The aim is to compile data and identify information on skills related to entrepreneurship and sustainability, targeting at recording the existing situation in the food and catering sector as an industry, in the relevant European frameworks, and in VET education.

Activity 1 Initial mapping of emerging/required skills in the food/catering sector

Survey in food/ catering industries

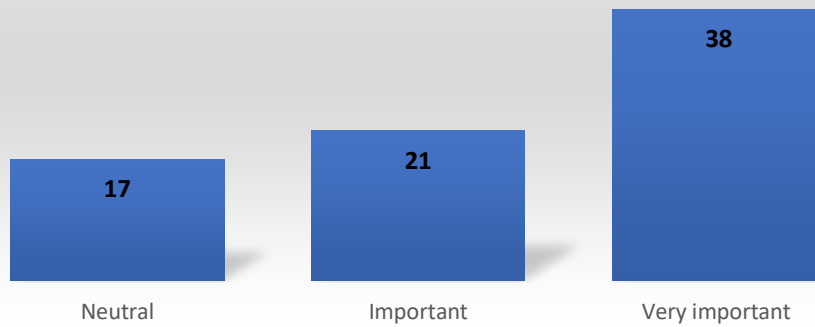
The first part of Activity 1 includes the results of a survey conducted in industries from the food and catering sector. For an initial mapping of the required skills in the food/ catering sector and the analysis of these main green, digital and entrepreneurial skills necessitated by industries, a questionnaire was created and shared to compile answers by employers in the food/ catering field (Annex 1). The first part of the questionnaire was developed based on GreenComp, the reference framework on sustainability competences at EU level, and the second part of the questionnaire was developed based on EntreComp, the framework that indicates the necessary entrepreneurial competences for all the fields in the 21st century. The need of competences was rated on a Likert scale from 1 to 5.

In total, 76 questionnaires were compiled from the partner countries: Italy, Belgium, Spain, Portugal, Greece, Romania. The majority of the respondent SMEs, 62 out of 76, occupy staff with 1-20 people, while the rest have more than 20 employees up to 70 in a unique case. When approaching the enterprise to participate in the survey, a staff member was indicated by the entity as the contact person and was assigned to answer the questionnaire. The respondents came from the administration staff, the owners themselves, general managers or managers of specific departments, and the chefs as employees whenever it concerned a restaurant. Finally, most of the respondents answered that they represent the majority or all the employees of the enterprise.

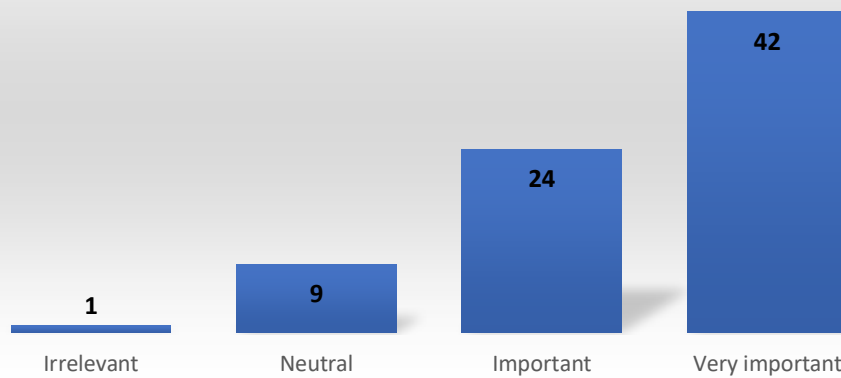
As far as sustainability practices are concerned, only two (2) of the participants in the survey answered that there hasn't been any introduction of such practices in their enterprise. The other 74 enterprises replied that they apply sustainability practices, such as a menu with seasonal products, waste management, and use of eco-friendly materials mainly, and short supply chain and use of low consumption equipment secondarily. Other sustainability practices that were suggested by enterprises' representatives to be followed in their work are use of water dispenser, collaboration with local producers and training about the topic of sustainability, integrated food safety management system and food industry good practices (GFM), coaching for instructors of the structure and use of eco-labelled cleaning products, and last but not least, quality and food safety integrated management systems (ISO 9001 and HACCP).

The first topic to be explored in the questionnaire was Sustainability, and more specifically the field '**Understanding of sustainability challenges**'. As it is shown in the following charts, it is considered very important by most employers to recognize the principal relations and problems between humans and environment, understand the environmental impact of food, and understand the correlation between health and sustainable food.

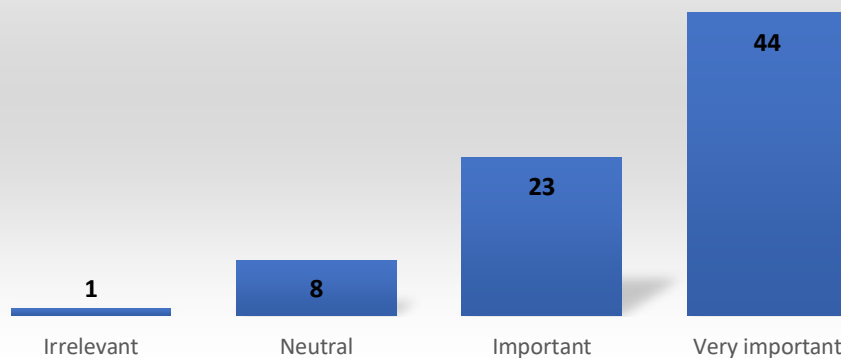
Recognize the principal relations and problems between humans and environment



Understand the environmental impact of food

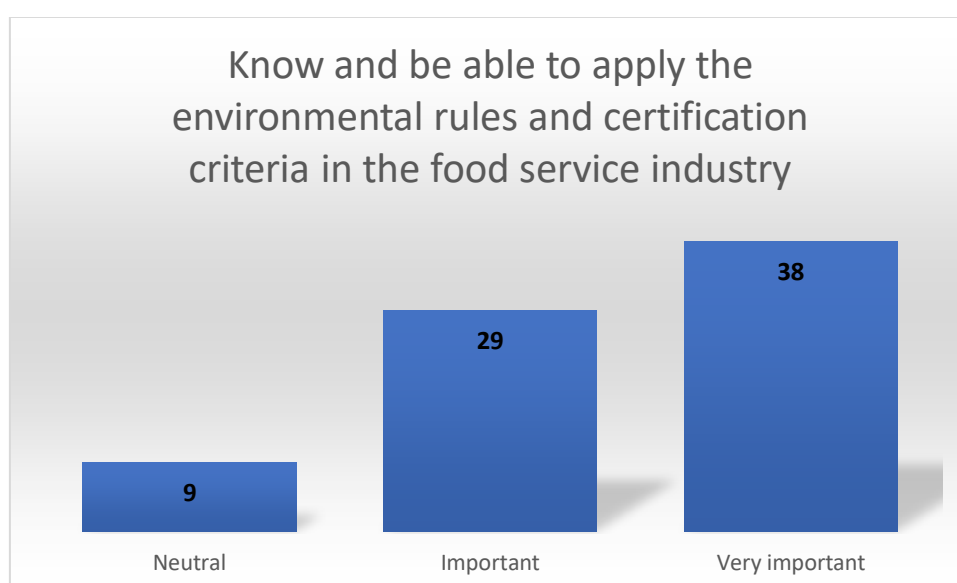
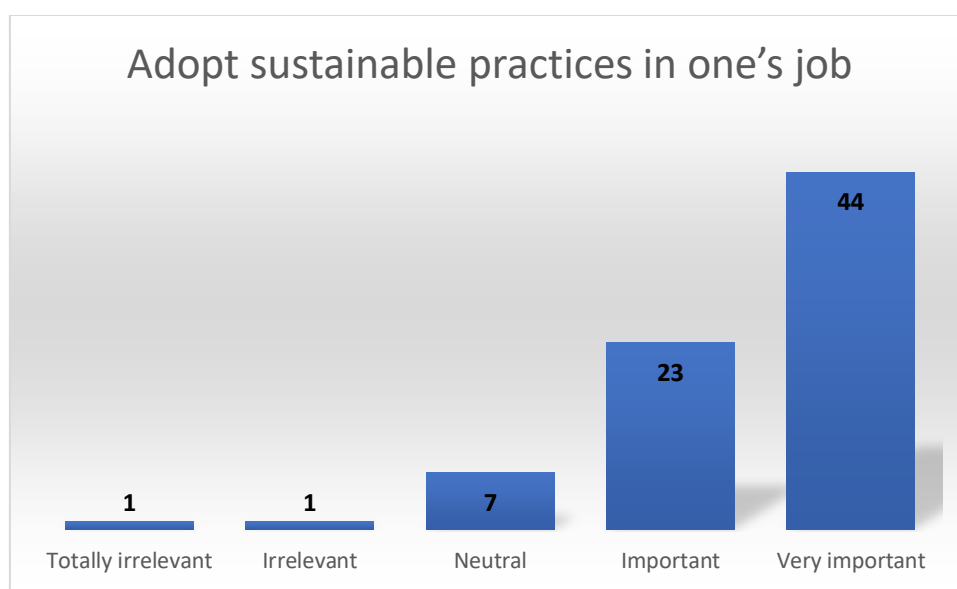


Understand the correlation between health and sustainable food

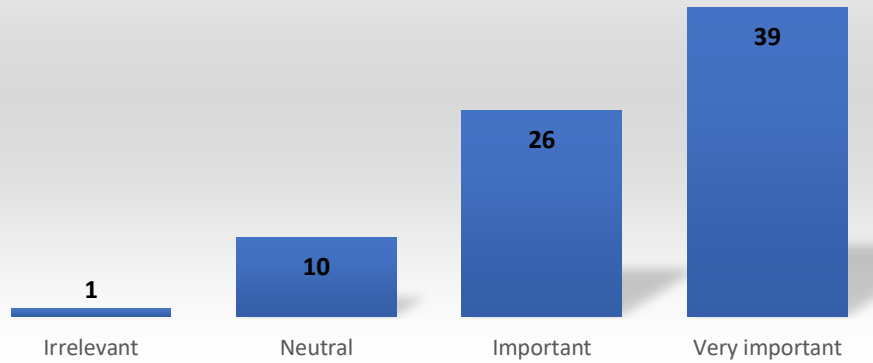


For the competence of awareness on **Sustainable Practices**, the participants had to evaluate how relevant and important is to 1) adopt sustainable practices in one's job, 2) know and be able to apply the environmental rules and certification criteria, 3) know which ingredients have the highest environmental impact, 4) identify and implement practices coherent with a sustainable management of waste, 5) be able to develop a menu focused on seasonal ingredients and other similar sustainable adjustments, and 6) select sustainable production systems for all food and consumables.

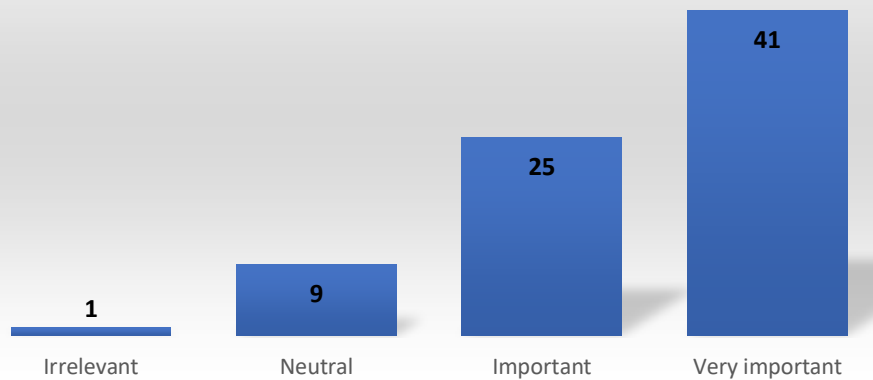
Paramount importance is given to these competences by respondents, too, giving us the opportunity to conclude at a first level that the skills related to Sustainability will be considered as critical in their full spectrum. Yet, the competences that were considered as very important on a higher degree are the ability to adopt sustainable practices at work, the ability to identify and implement practices coherent with a sustainable management of waste, and the ability to develop a menu focused on and/or inspired by seasonal, local, plant-based ingredients.



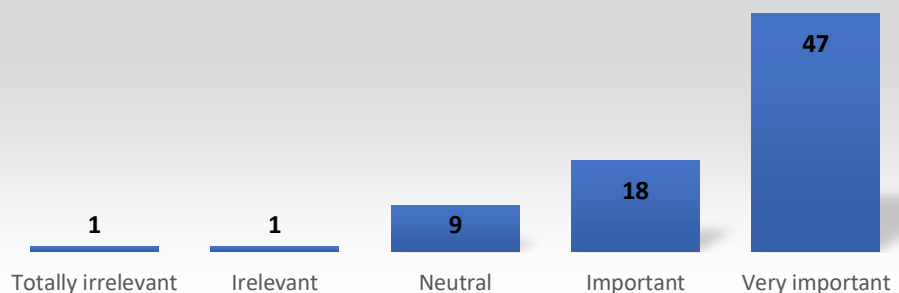
Know which ingredients have the highest environmental impact

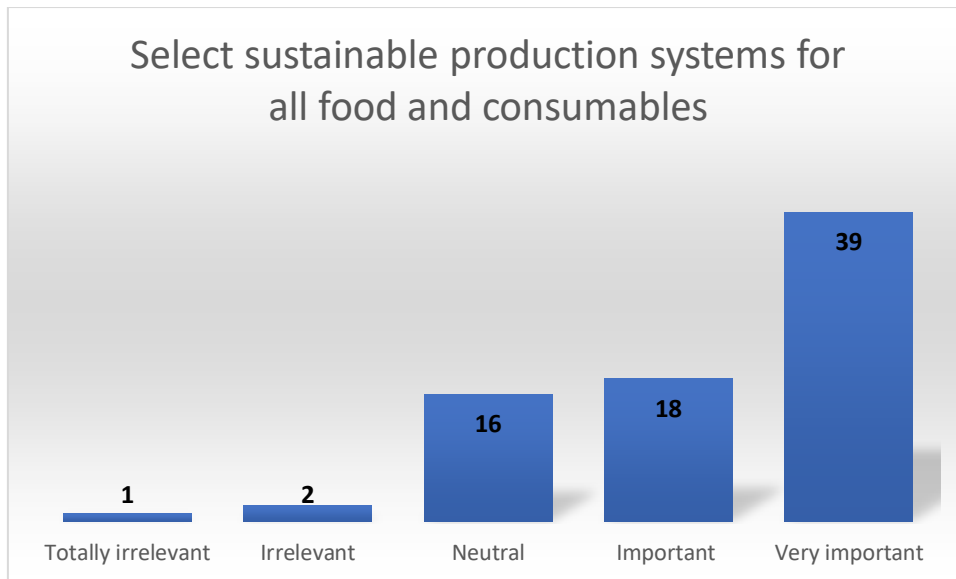


Identify and implement practices coherent with a sustainable management of waste

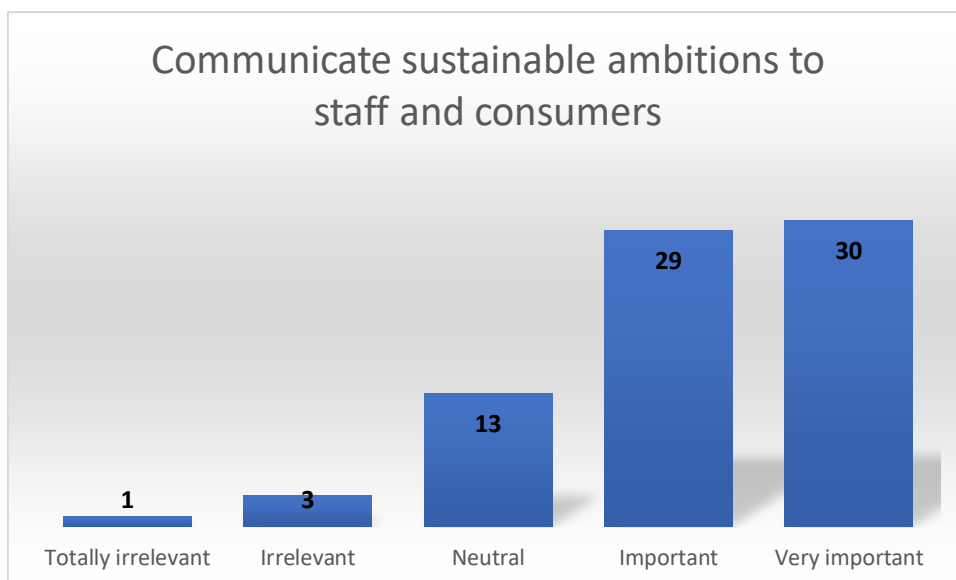


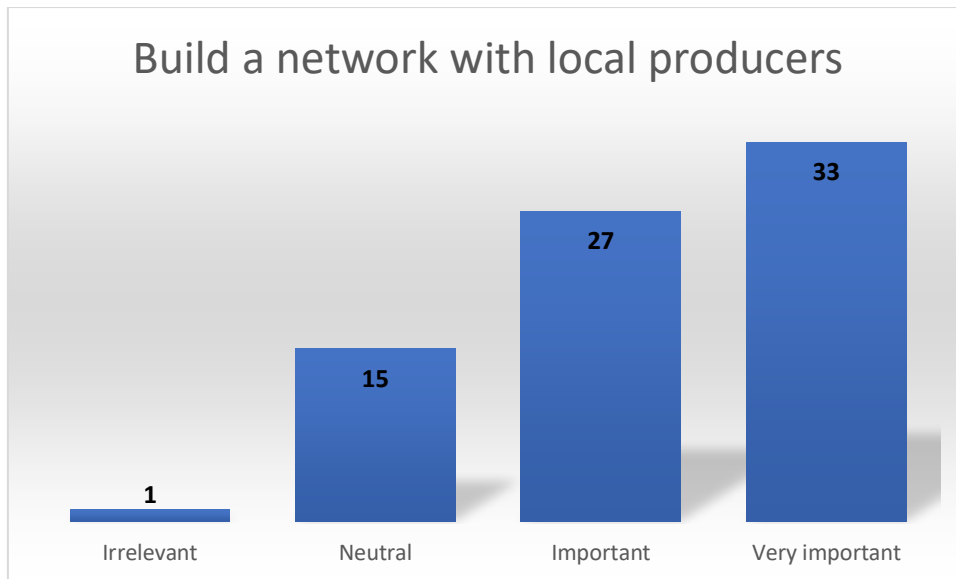
Be able to develop a menu focused on seasonal ingredients, produced locally, using smaller amounts of animal products in dishes and expanding plant-based dishes



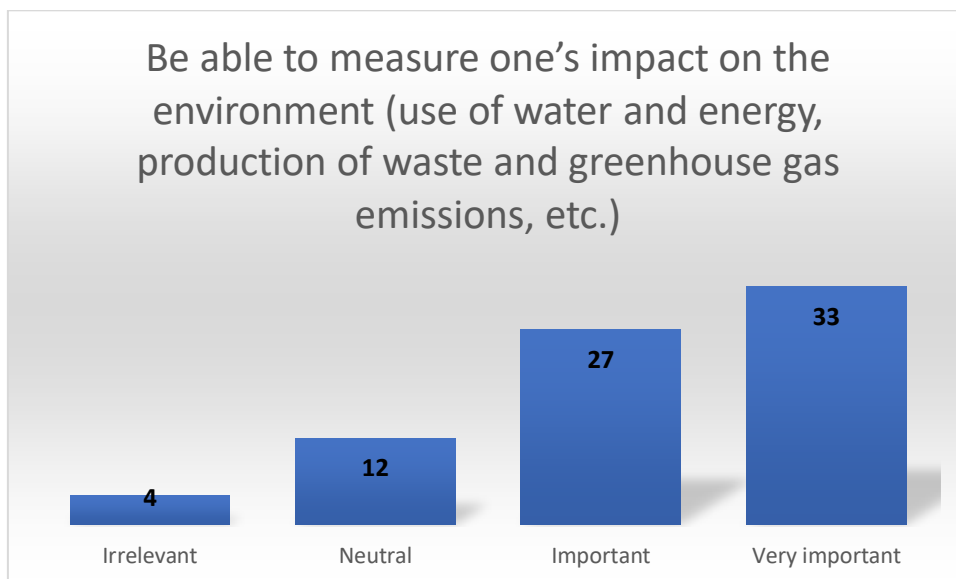


Communication and network competences comprise another set of skills related to sustainability. More specifically, these competences were reflected in the questionnaire with the items of 'Communicate sustainable ambitions to staff and consumers' and 'Build a network with local producers'. The majority of respondents rated these competences as 'Important' or 'Very important', however, there is a slight differentiation to the percentages of each rating compared to previous competences' ratings. In the following charts, it appears that there are equal responses for 'Important' or 'Very important' while in the previous responses, the rating 'Very important' was far higher than 'Important' in most cases. Also, a slight increase is noticed in the rating 'Neutral' in these competences, meaning that respondents considered it as neither important nor irrelevant.



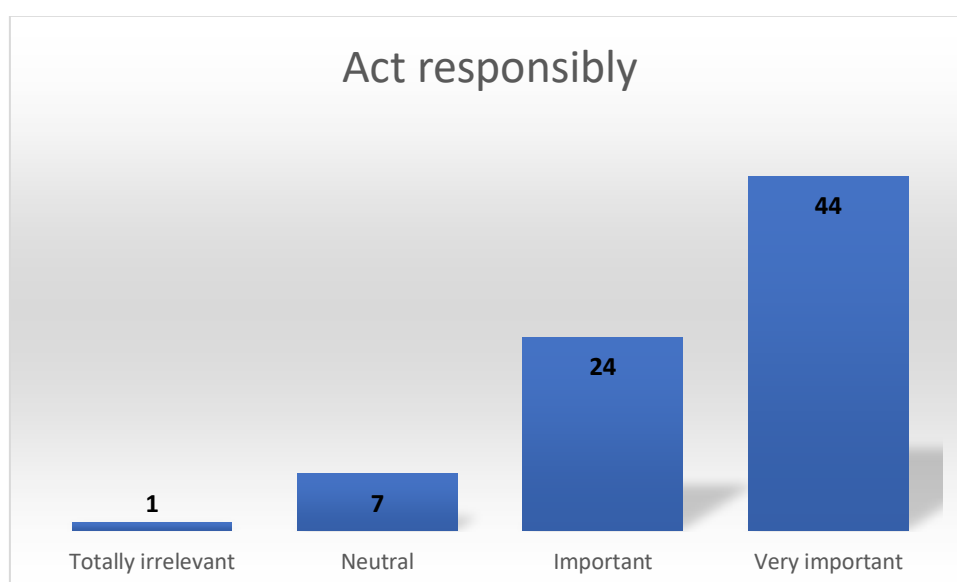


More or less, the same condition applies to the competence **Measure of impact** concerning one's impact on the environment (use of water and energy, production of waste and greenhouse gas emissions, etc.) in the field of Sustainability. Being able to measure the impact is a competence characterized as important and very important but the rating 'Very important' was not much more than the 'Important' one, meaning that respondents do not consider it as core competence.

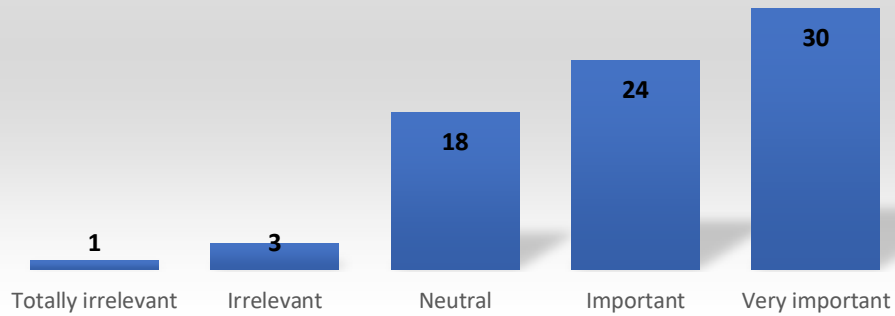


The second part of the questionnaire in the industries addressed staff expertise in entrepreneurship. The industries' representatives were asked to rate the degree that the employees should have specific entrepreneurial competences in workplace. The competences related to entrepreneurship that were identified and rated through the questionnaire were categorized according to the pillars of EntreComp: **1) Ideas & Opportunities**, **2) Resources**, and **3) Into action**.

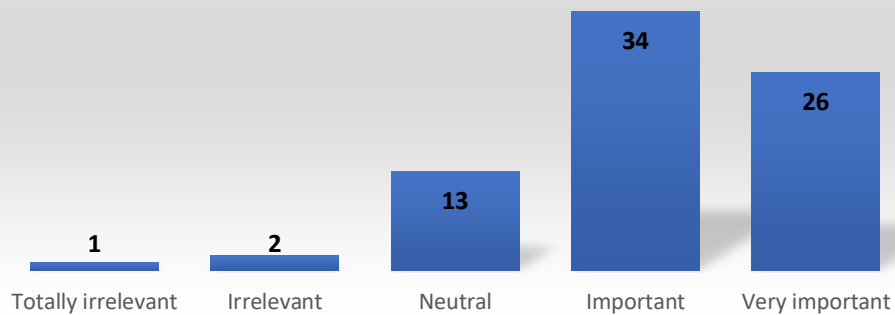
To begin with the field **Ideas & Opportunities**, the competence rated mostly as 'Very important' by 44 respondents out of 76 is the 'Act responsibly', followed by the competence 'Identify needs and challenges that need to be met' with 30 'Very important' responses out of 76. The rest of the competences in this field were rated mostly as 'Important' rather than 'Very important', with the competence 'Develop several ideas and opportunities to create value including better solutions to existing and new challenges' being rated as important by 34 respondents, the competence 'Explore and experiment with innovative approaches' was important for 31 respondents, the 'Visualise future scenarios to help guide effort and action' competence was rated also as important by 27 respondents, and the last competence that was mainly important for 35 respondents was 'Reflect on how sustainable long-term social, cultural and economic goals are, and the course of action chosen'.



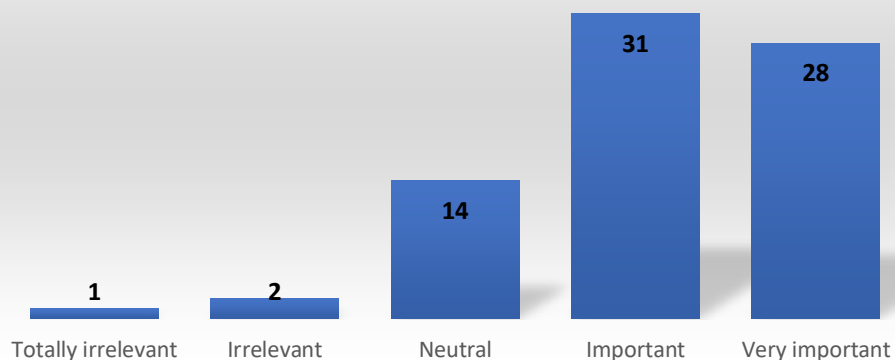
Identify and assess individual and group strengths and weaknesses, being determined to satisfy the need to achieve

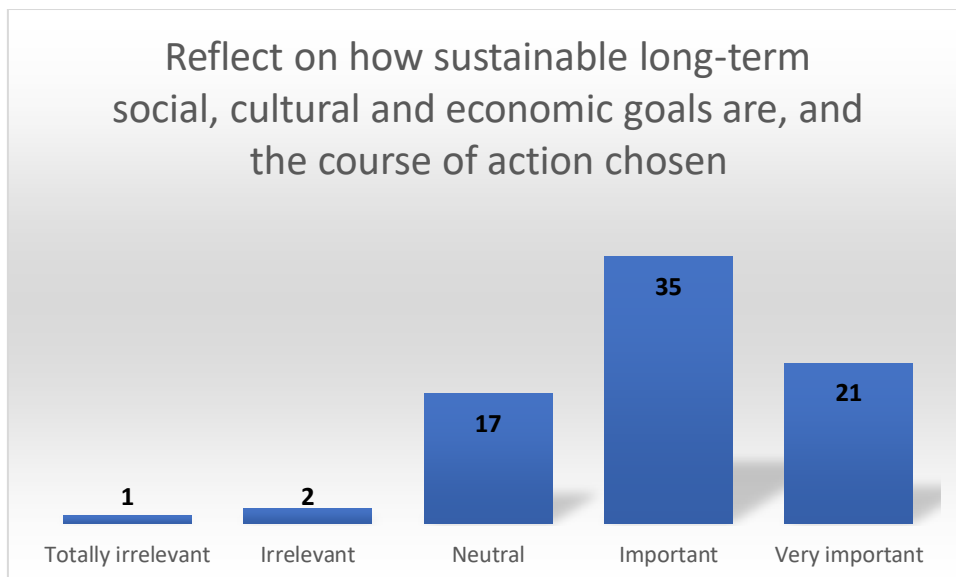
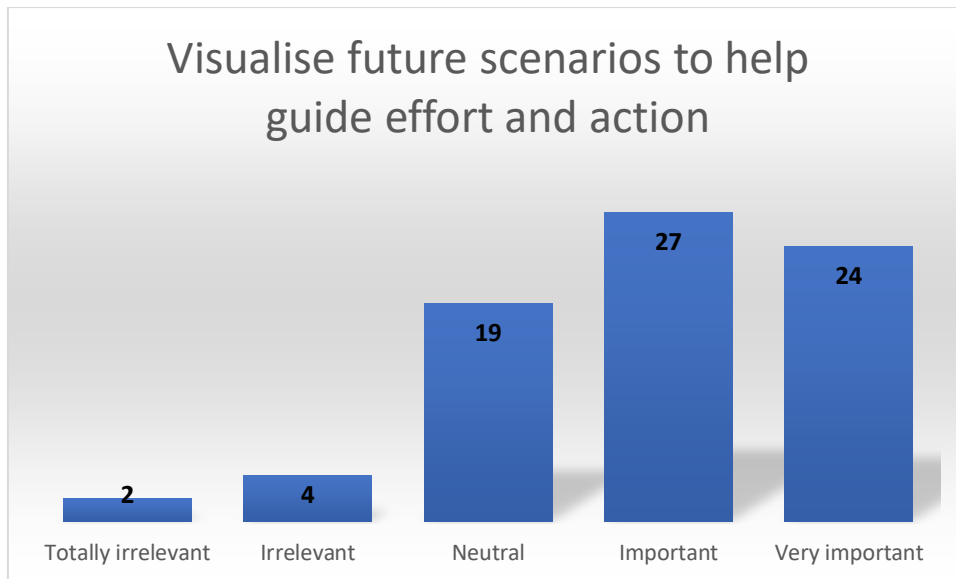


Develop several ideas and opportunities to create value including better solutions to existing and new challenges



Explore and experiment with innovative approaches

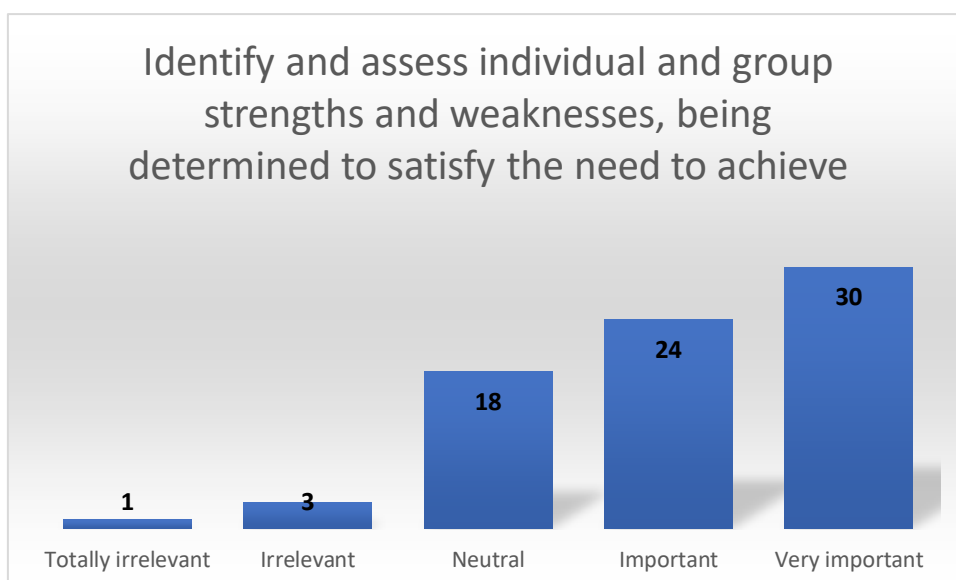
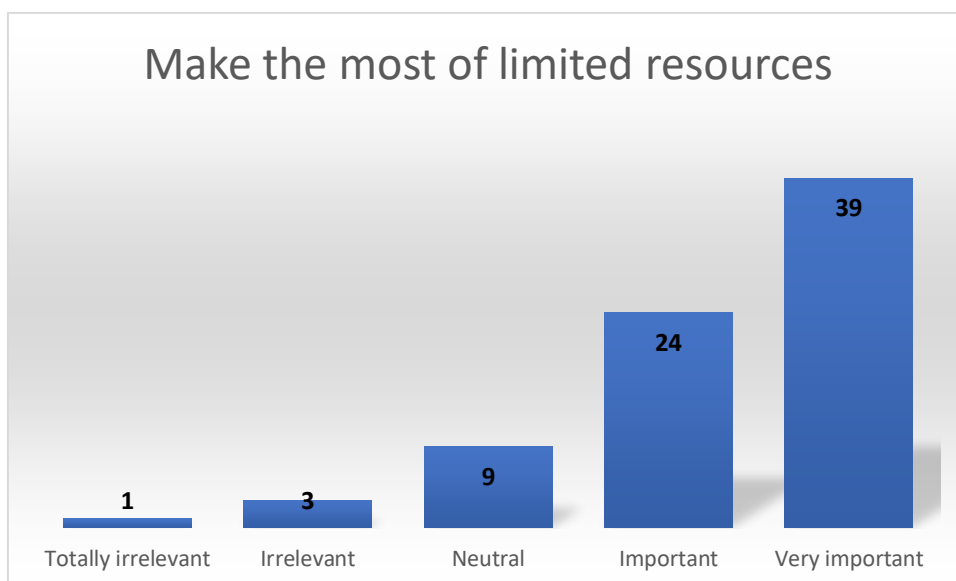




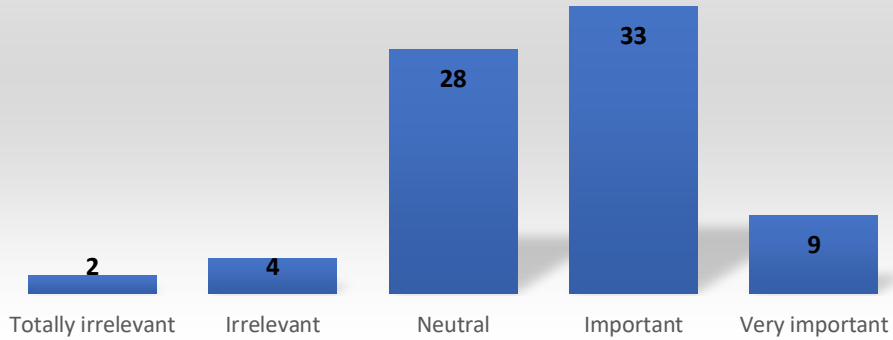
To continue with the field **Resources** of entrepreneurial competences, here was noticed a discernible increase in the neutral response for some competences compared to previous fields of sustainability and entrepreneurial competences. Although in this section, too, most of the respondents identified the included competences mostly as ‘Important’ and ‘Very important’ to have, the response ‘Neutral’ that indicates medium need of these competences at the workplace was higher in some cases than for other competences.

From the competences that were rated here, the ‘Very important’ ones was to ‘Make the most of limited resources’ and ‘Identify and assess individual and group strengths and weaknesses, being determined to satisfy the need to achieve’ which were the only ones that had more ‘Very important’ responses than other ratings, with the former compiling 39 ‘Very important’ compared to 24 ‘Important’ responses indicating an adequate difference and the latter compiling 30 ‘Very important’ compared to 24 ‘Important’ responses indicating a slight difference. All the other competences that

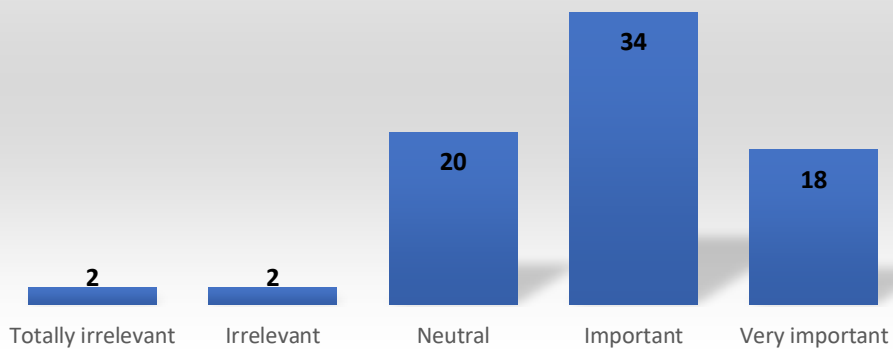
were evaluated in this field, namely 'Get and manage the competences needed at any stage, including technical, legal, tax and digital competences', 'Get the support needed to achieve valuable outcomes', 'Demonstrate effective communication, persuasion, negotiation, and leadership', and 'Interact, communicate and share information/content through digital technologies' were considered mostly 'Important' instead of 'Very Important'. Last but not least, the competences 'Get and manage the competences needed at any stage, including technical, legal, tax and digital competences' and 'Get the support needed to achieve valuable outcomes' presented the highest percentages of 'Neutral' response (20 and more out of 76) while almost all the other competences also had the 'Neutral' response at a percentage of 1/7 of all provided responses.



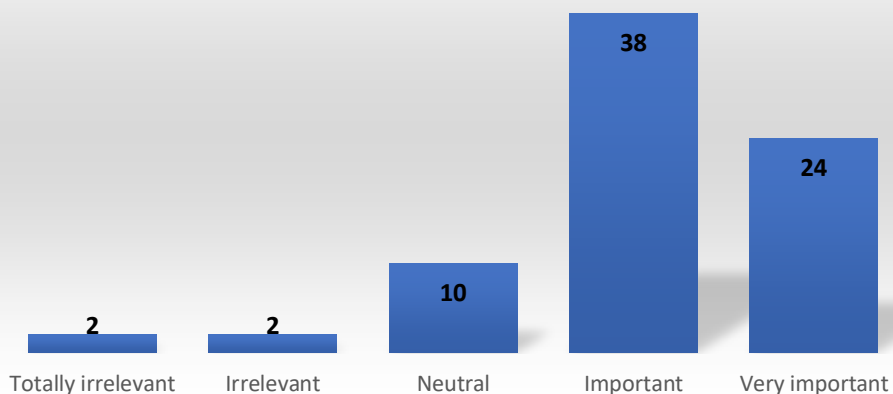
Get and manage the competences needed at any stage, including technical, legal, tax and digital competences

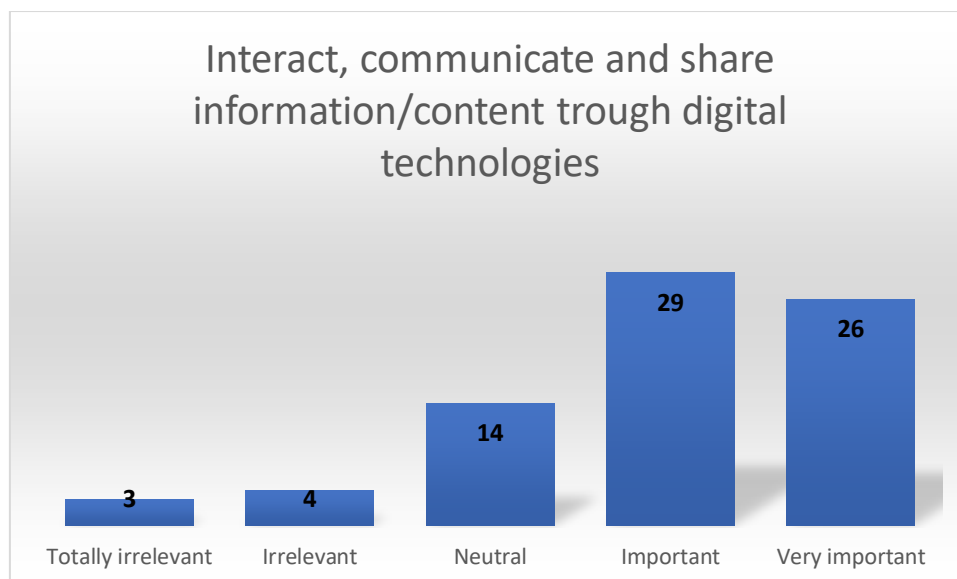


Get the support needed to achieve valuable outcomes

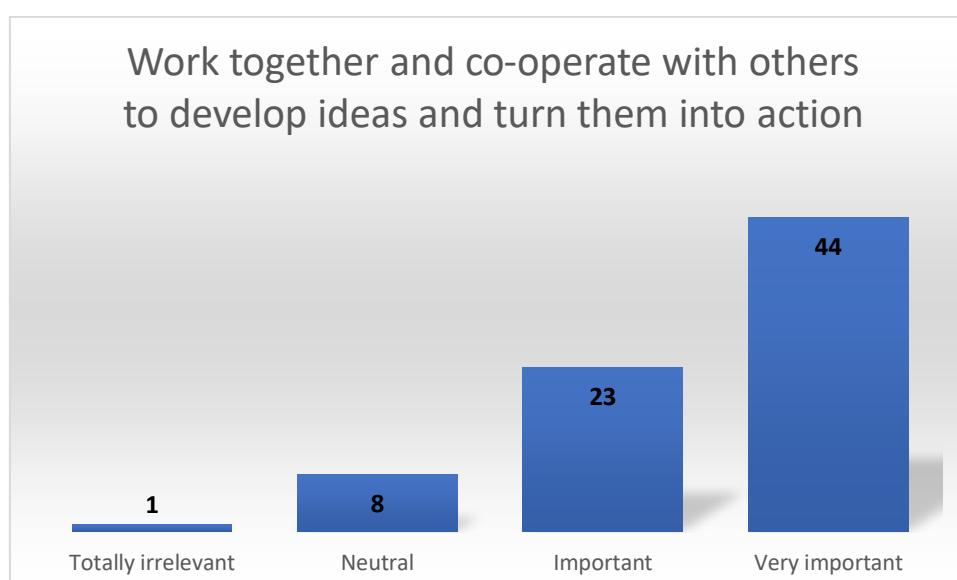


Demonstrate effective communication, persuasion, negotiation, and leadership

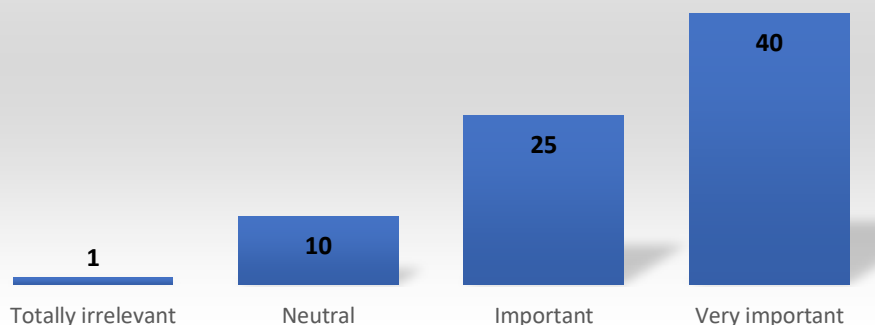




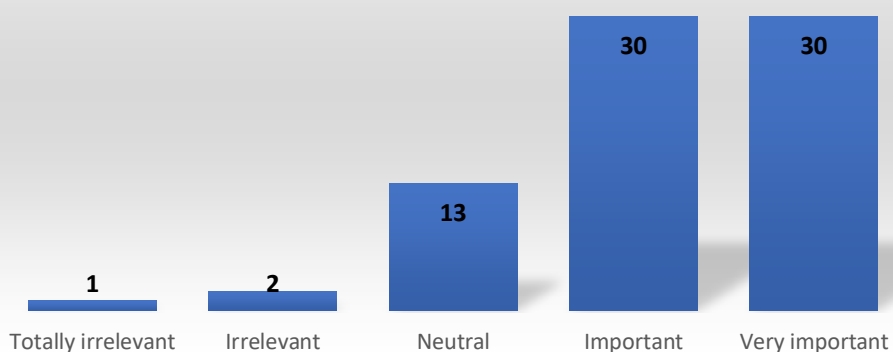
Within the **Into action** field, the rating of competences as ‘Important’ and/or ‘Very important’ was similar in most cases, as can be seen in the following charts. The only exceptions in competences that were rated as ‘Very important’ with a big difference from ‘Important’ rating were the ‘Work together and co-operate with others to develop ideas and turn them into action’ and the ‘Learn with others, including peers and mentors, and learn from both success and failure’. The competences ‘Initiate processes that create value and take up challenges’, ‘Act and work independently to achieve goals, stick to intentions, carry out planned tasks and adapt to unforeseen changes’, ‘Set long-, medium- and short-term goals’, ‘Define priorities and action plans’, ‘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’, and ‘Handle fast-moving situations promptly and flexibly to solve conflicts and face up to competition’ presented equal or slightly different number of responses between ‘Important’ and ‘Very important’ options, a rating that indicates the total importance of these competences is high.



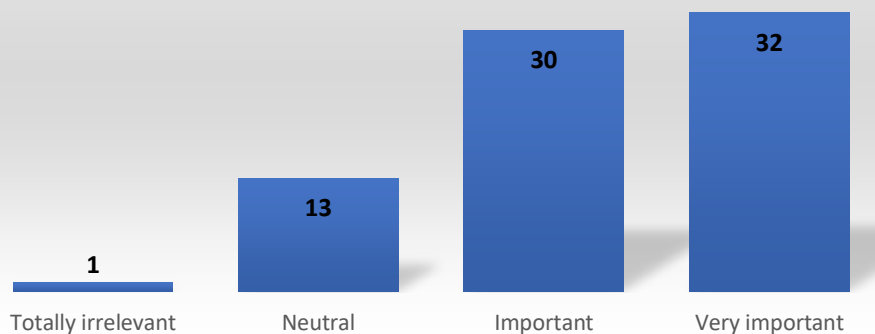
Learn with others, including peers and mentors, and learn from both success and failure



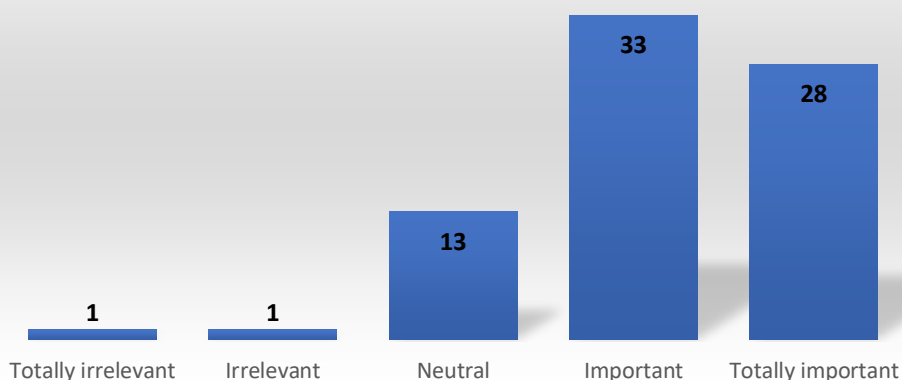
Initiate processes that create value and take up challenges



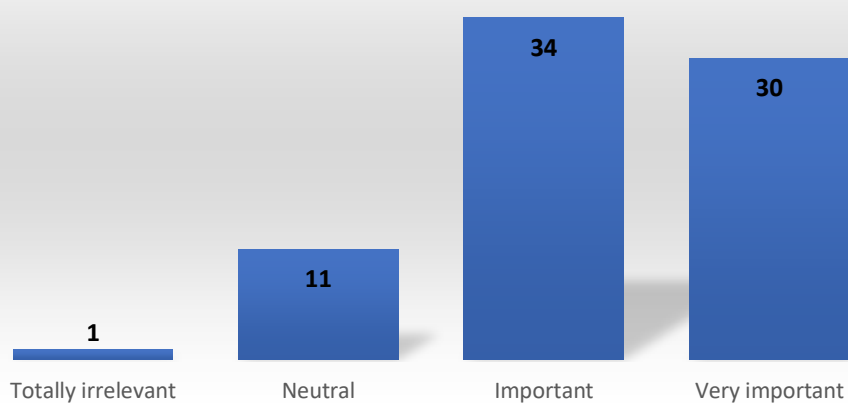
Act and work independently to achieve goals, stick to intentions, carry out planned tasks and adapt to unforeseen changes



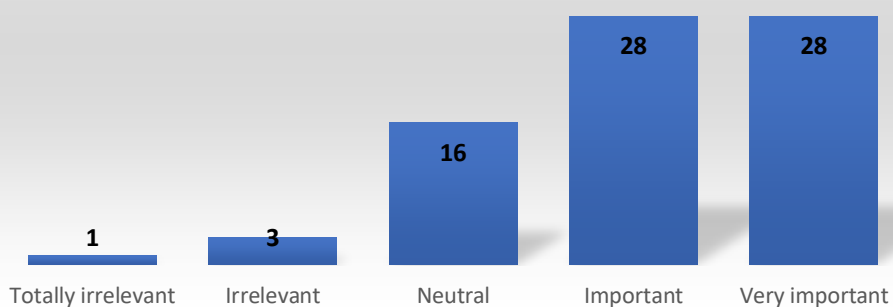
Set long-, medium- and short-term goals

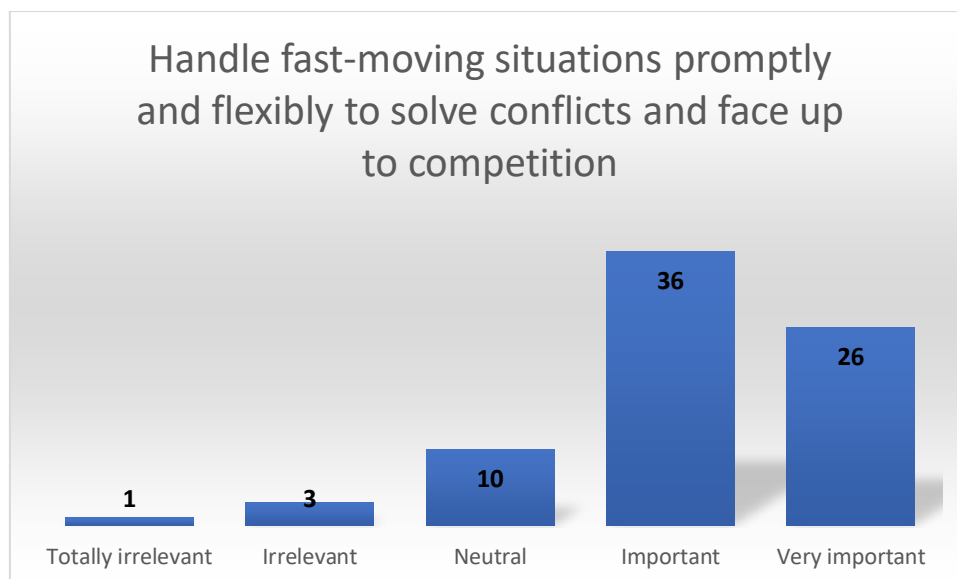


Define priorities and action plans



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





All the above data considered, it can be concluded that skills related to sustainability, entrepreneurship, and communication/networking are necessary in the food and catering sector. The survey conducted among food and catering industries showed that sustainability practices are required in most of the enterprises surveyed. The most important competences related to sustainability include adopting sustainable practices at work, identifying and implementing practices for sustainable waste management, and developing menus that focus on seasonal, local, and plant-based ingredients. Communication and networking competences were also rated as important for sustainability.

Overall, the survey suggests that the food and catering sector requires a combination of green, digital, and entrepreneurial skills. Enterprises need employees who are aware of the environmental impact of food and who can develop and implement sustainable practices in the workplace. They also need employees who can communicate and network effectively, build relationships with local producers, and measure their impact on the environment. Additionally, entrepreneurial competencies such as identifying needs and challenges, developing ideas and opportunities, and taking action to achieve goals are important for success in the food and catering sector.

Skills mapping through frameworks

Speaking of the required skills in the food/ catering sector and more specifically of the main green, digital and entrepreneurial skills necessitated by industries, it was considered as critical to map the skills indicated in the European frameworks for this sector. The frameworks that were used for the skills mapping are: **EntreComp**, **DigComp**, and **GreenComp**.

Each framework was assigned to a pair of partners, consisting of a VET center and a technical partner wherever it was possible. The working pair had to study the framework and any other material(s) they considered useful and identify which competences from those that are described in the framework are critical for future employees and/or employers in the food/catering sector. They had to elaborate on the reasons why the identified emerging/required skills are considered essential in the catering and restaurant sector and how they are connected with the accomplishment of sustainability in the sector.

After the finalization of the necessary skills for the target group, the group had to write down their findings/suggestions in a template defined by the WP leader. The working pairs had the flexibility to e-meet and communicate for the task bilaterally as it was more convenient for them. They were supported with clarifications and feedback by the WP leader who is responsible for providing the results through a report after the filled templates were submitted by all the working pairs.

EntreComp is a common reference framework that identifies 15 competences in three key areas that describe what it means to be entrepreneurial. EntreComp offers a comprehensive description of the knowledge, skills and attitudes that people need to be entrepreneurial and create financial, cultural or social value for others.¹



Source: <https://ec.europa.eu/social/main.jsp?catId=738&langId=en&pubId=8201&furtherPubs=yes>

¹<https://ec.europa.eu/social/main.jsp?catId=1317&langId=en#:~:text=EntreComp%20is%20a%20free%2C%20flexible,practice%20to%20develop%20entrepreneurial%20skills>

IED and AKMI were assigned to conduct skills mapping through EntreComp. The partners decided to use the three (3) Key Areas of EntreComp (**Ideas & Opportunities, Resources, Into Action**) as the skills categories of the mapping from which the specific skills were analyzed. As shown in Figure 1, the indicated competences of EntreComp that were identified in the first skill category are: **Spotting opportunities, Creativity, Vision, and Ethical and sustainable thinking**. Spotting opportunities is useful for youth who want to be involved in the food/catering sector to be able to identify and seize opportunities to create value in the food/catering business and discern sustainability needs and challenges that need to be met in the food/catering sector or their business specifically. Creativity is necessitated to develop ideas and opportunities that will help them to create value and achieve valuable and sustainable effects in the food/catering business by exploring new innovative approaches. In order to imagine a sustainable future and work on reality like scenarios aiming to turn knowledge into action, young people need vision in their work. Last, if youth adopt Ethical and sustainable thinking, they will be able to assess the ideas and the effect of entrepreneurial action that bring sustainable value, reflect on how sustainable goals are and what actions need to be taken in business, and act responsibly towards the target community, market, society and the environment.

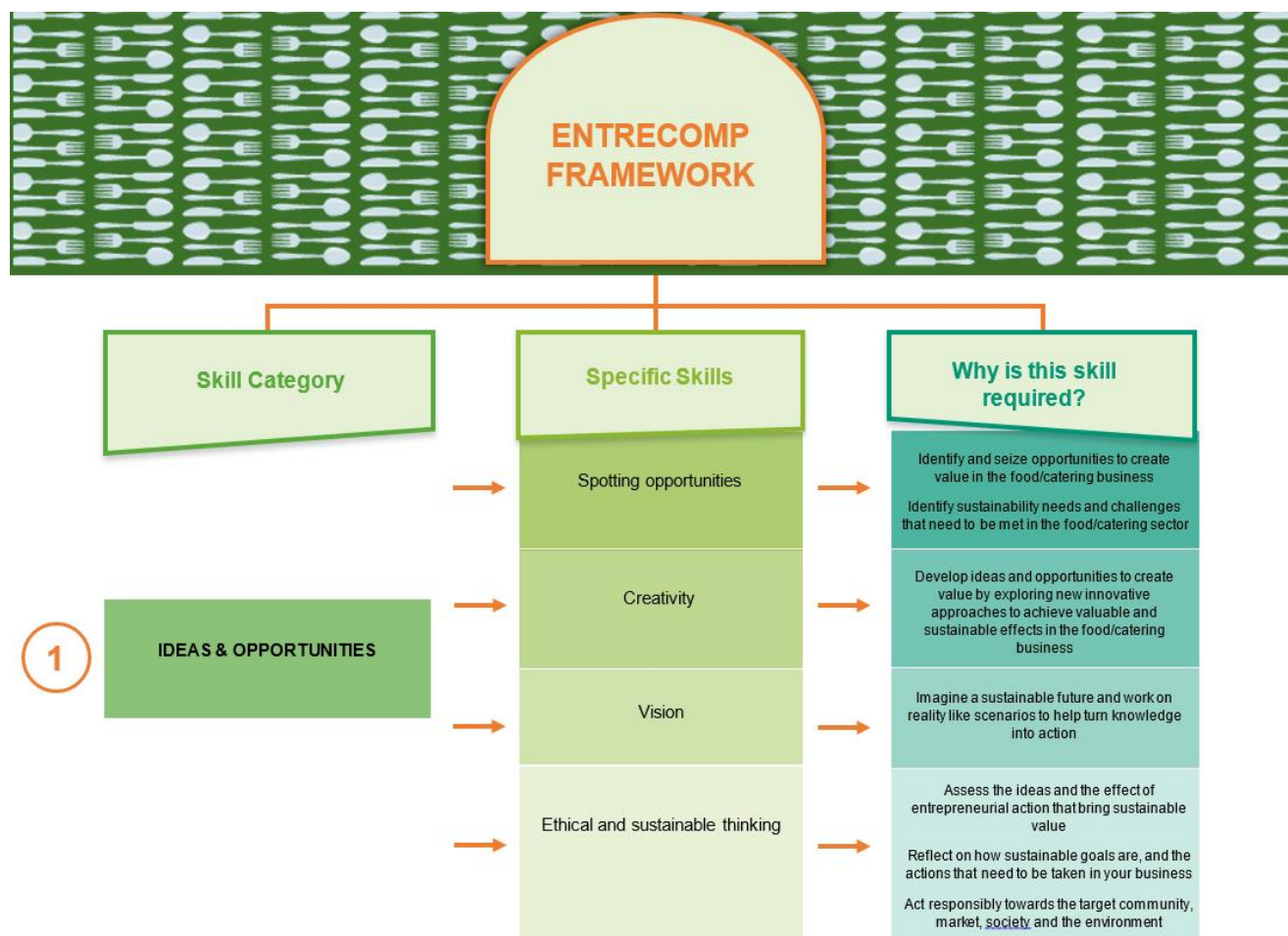


Figure 1. EntreComp mapping Part 1

The specific skills from EntreComp that were considered as critical in the skills category **Resources** are: Self-awareness & self-efficacy, Motivation & perseverance, Mobilising resources, Financial & economic literacy, and Mobilising others. In order to answer why each of these skills is required, the main aim of sustainability achievement in future enterprises was the “guide” to identify which skills should be gained and developed by young people to be able to correspond to future professional environments. With increased self-awareness and self-efficacy future entrepreneurs will be able to reflect on sustainable needs, aspirations and wants in the short, medium, and long term of their business in the food/catering sector and at the same time identify and assess their and their team’s strengths and weaknesses. This competence combined with strong motivation and perseverance will help young people be determined to turn ideas into action for a more sustainable food/catering sector and prepared to put efforts for their long-term business goals. As it can be inferred, the financial and economic literacy will make youth capable of managing economic and fiscal issues to make sure value-creating activities can last and lead to sustainability in their business. Last but not least, mobilizing resources, either tangible or human, will equip young entrepreneurs with the skills to acquire and manage material, non-material and digital resources, limited or not, and competences to turn ideas into action for a more sustainable food/catering business. Also, they will get the support needed to achieve valuable and sustainable outcomes, through practicing communication, persuasion, negotiation, and leadership skills within collaboration.

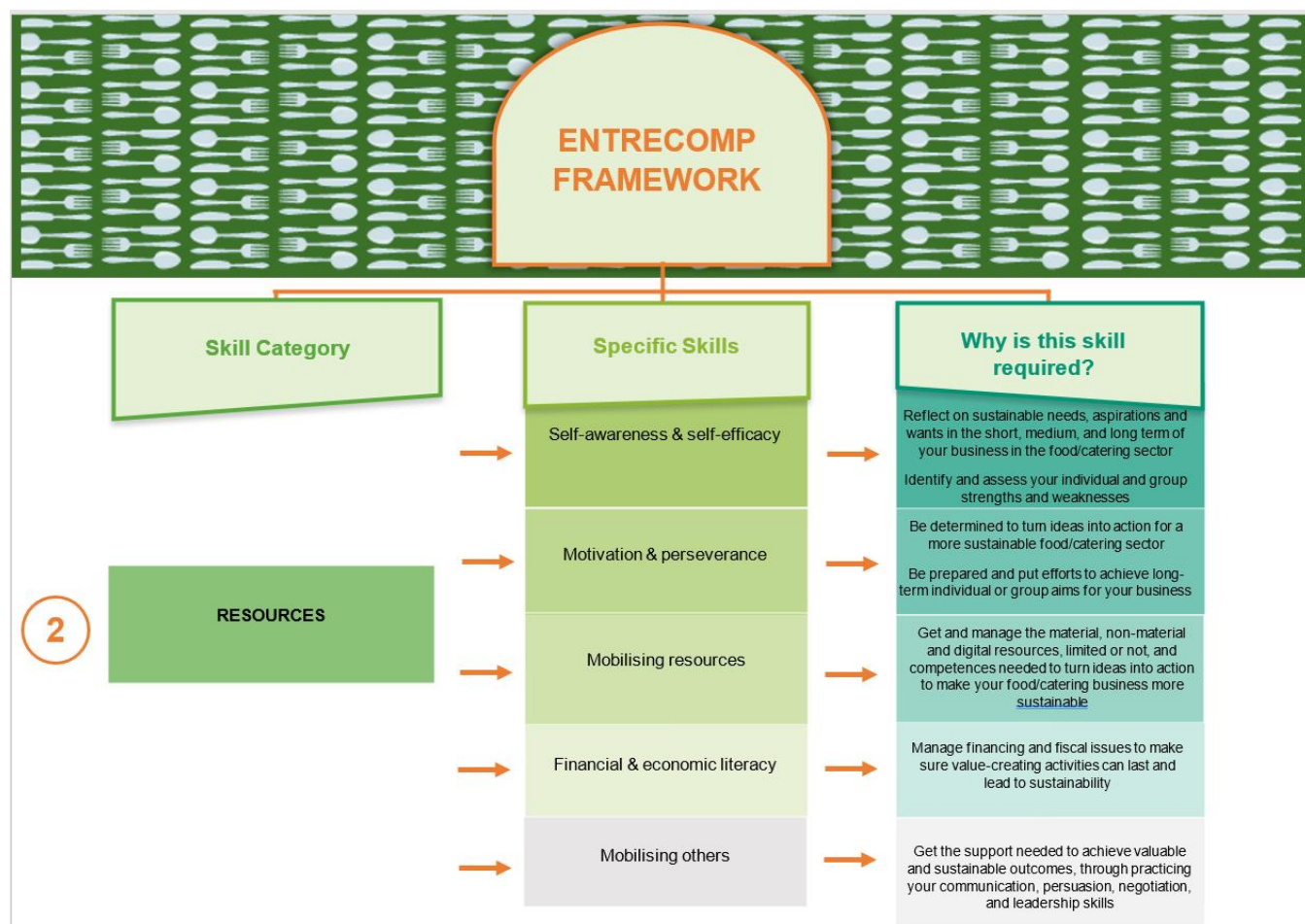


Figure 2. EntreComp mapping Part 2

In the last skills category of **Into action**, five (5) competences were assessed as the most important to be identified in terms of EntreComp: Taking the Initiative, Planning and management, Coping with uncertainty, ambiguity and risk, Working with others, and Learning through experience. Initiative-based work will aid young people act and work independently to achieve sustainable goals and create a more sustainable future. Advanced skills for planning and management are necessary for long-, medium- and short-term goals setting and for the definition of priorities and action plans to achieve sustainability. Moreover, this competence is required for being able to adapt to unforeseen changes in a business, and in combination with the competence Coping with uncertainty, ambiguity and risk, future workers in the food/catering sector will be more skillful to handle fast-moving situations promptly and flexibly to make decisions and achieve sustainability. Skills for working with others are also important to build collaborations and face competition, aiming to turn ideas into action in sustainable ways and develop networks to explore sustainable practices in the food/catering sector. In addition, these networks offer the opportunity to learn through experience, which is another recognized competence in EntreComp as essential for future entrepreneurs in this sector in order to reflect on and use initiatives for sustainable value creation, by learning from successful and failed scenarios.

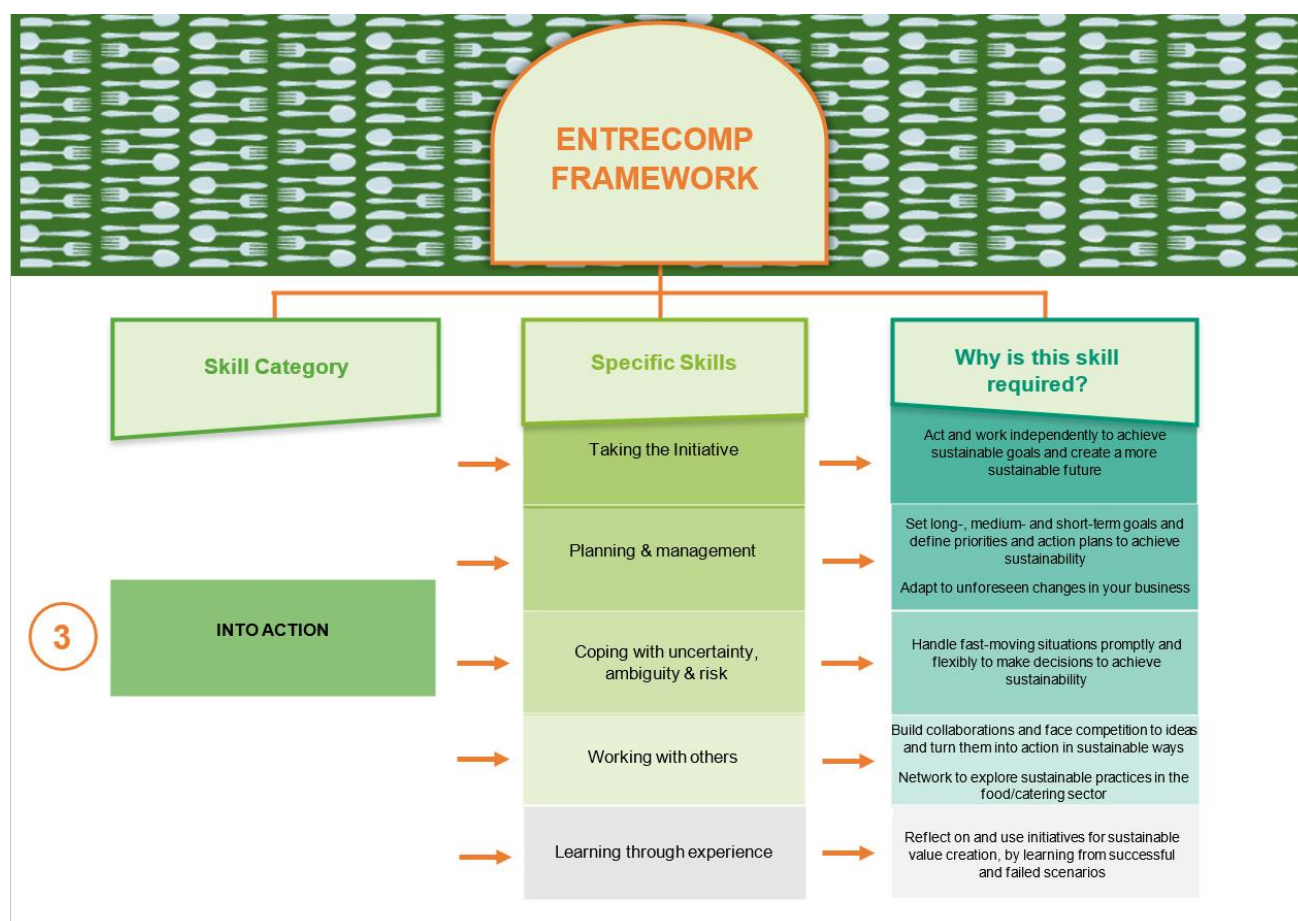


Figure 3. EntreComp mapping Part 3

GreenComp is a 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.²



Source: https://joint-research-centre.ec.europa.eu/greengcomp-european-sustainability-competence-framework_en

Amar Terra Verde and Pour la Solidarite undertook to conduct skills mapping through GreenComp. The four (4) main areas of GreenComp are:

1. Embodying sustainability values
Embracing complexity in sustainability

² Bianchi, G., Pisiotis, U. and Cabrera Giraldez, M., GreenComp The European sustainability competence framework, Punie, Y. and Bacigalupo, M. editor(s), EUR 30955 EN, Publications Office of the European Union, Luxembourg, 2022, ISBN 978-92-76-46485-3, doi:10.2760/13286, JRC128040. Available at <https://publications.jrc.ec.europa.eu/repository/handle/JRC128040>

2. Envisioning sustainable futures
3. Acting for sustainability

These key areas were used as the main skills categories for the framework mapping from which the must-have competences of GreenComp are recorded in the following mapping.

Starting with Embodying sustainability values, Valuing sustainability, Supporting fairness, and Promoting nature are the main skills that should be acquired and enhanced among young people who aspire to be occupied and transform the future food/catering sector. If these competences are cultivated at an adequate level, future employees and/or employers will be capable of articulating and negotiating sustainability values, principles and objectives while recognizing different viewpoints and how to align with sustainability values. Also, they will enhance their capacity to apply equity and justice for current and future generations as criteria for environmental preservation and the use of natural resources. The assessment of their impact on nature, efforts for the protection of nature, and the respect of needs and rights of other species are essential tasks that necessitate the strengthening of the above-mentioned GreenComp skills.

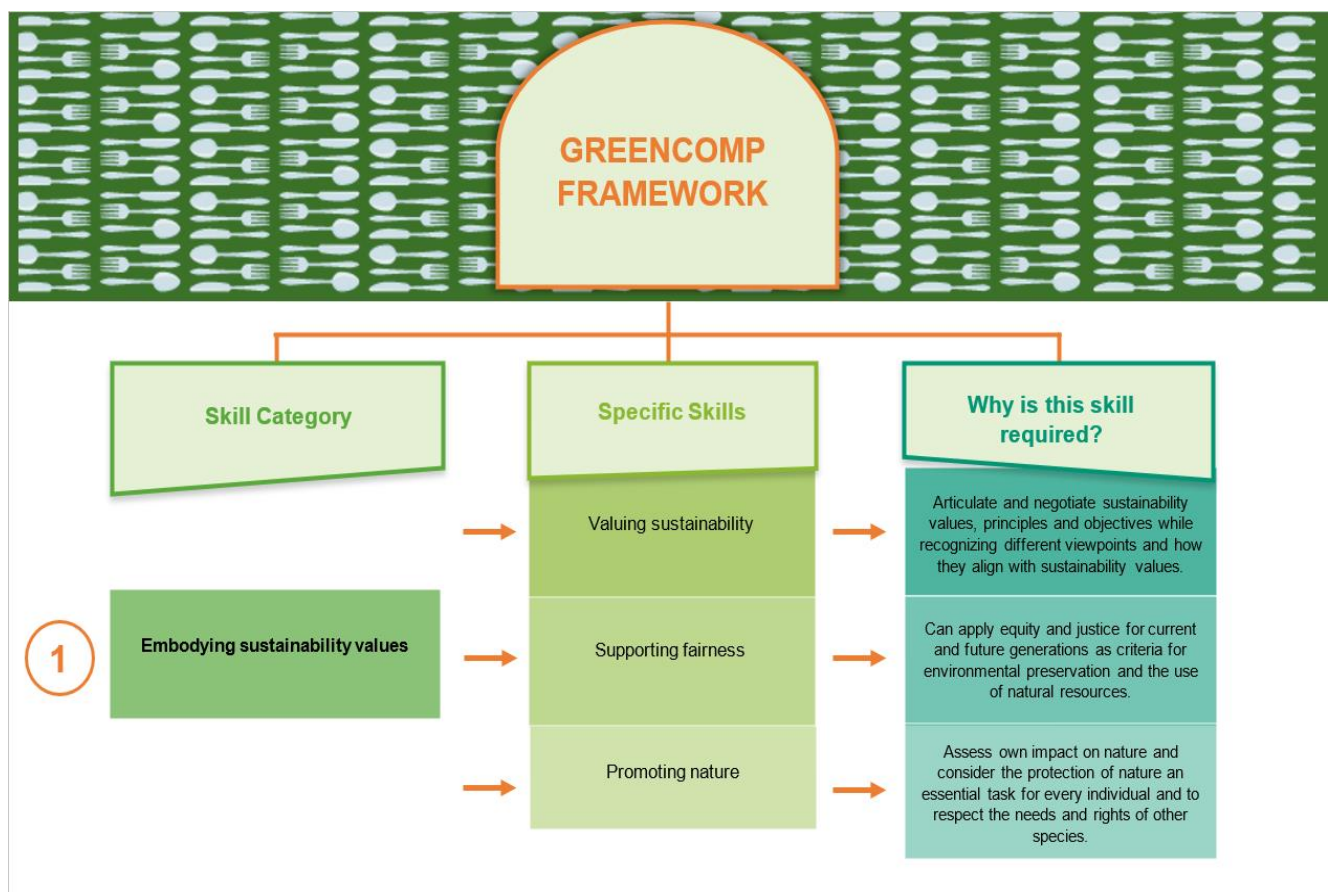


Figure 4. GreenComp mapping Part 1

In the next skill category of Embracing complexity in sustainability, the Systems thinking competence was the first one identified as of paramount importance in GreenComp. It is a competence needed among future food/catering sector stakeholders to be able to approach a sustainability problem from all sides, reflect that every human action has environmental, social, cultural and economic impact, and describe sustainability as a holistic concept that includes environmental, economic, social, and cultural issues. Critical is another competence of Embracing complexity in sustainability area of GreenComp because young people will be invited to analyse and assess arguments, ideas, actions and scenarios to determine whether they are in line with evidence and values in terms of sustainability in their future business. Finally, another important competence that was mapped as essential was Problem framing because it is needed among future employees/employers to be able to establish a transdisciplinary approach to framing current and potential sustainability challenges, identify suitable approaches to anticipating and preventing problems, and mitigate and adapt to already existing problems, also by listening actively and showing empathy when collaborating with others to frame current and potential sustainability challenges.

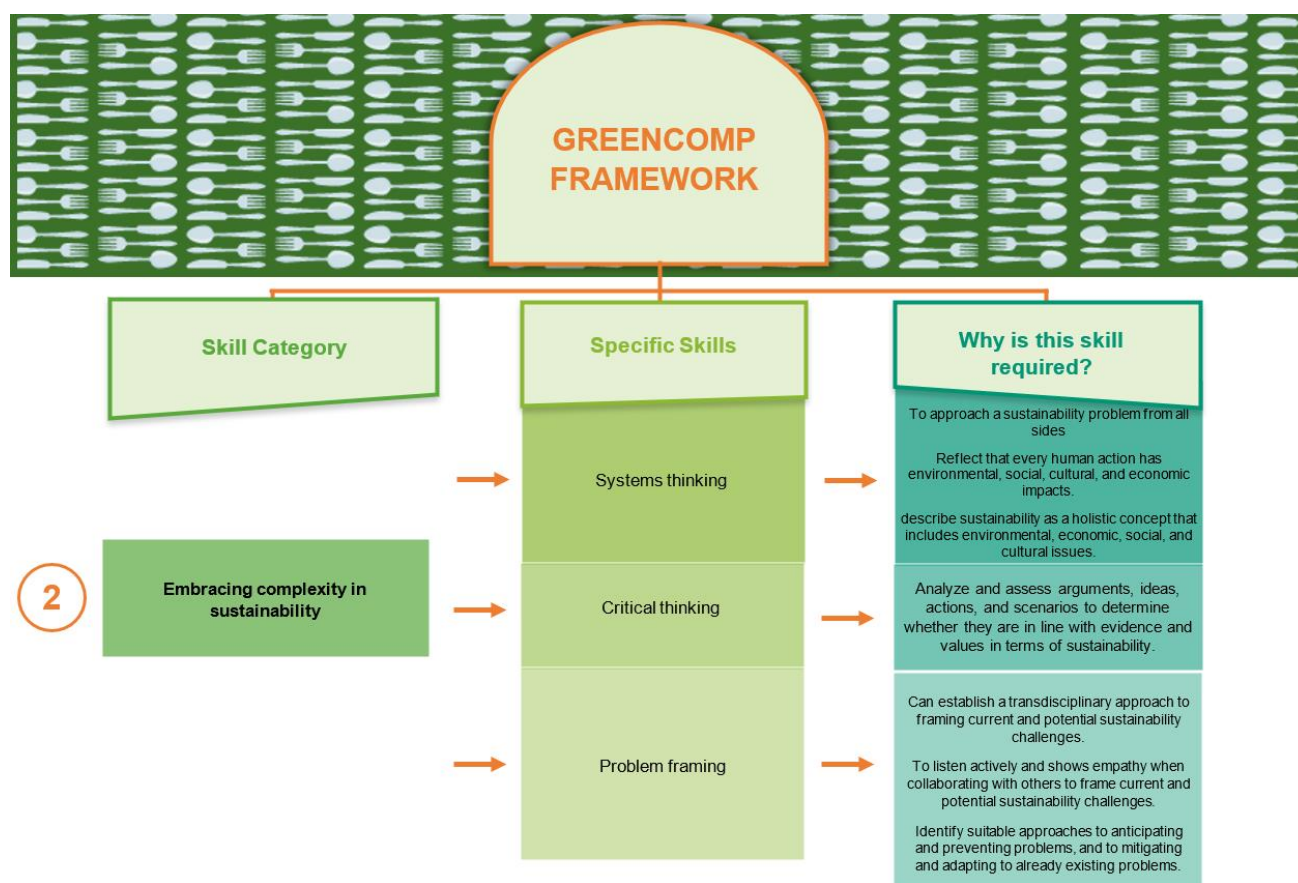


Figure 5. GreenComp mapping Part 2

The next competences that were mapped as important through GreenComp are: Futures literacy, Adaptability, and Exploratory thinking, arising from the skills area Envisioning sustainable futures. Futures literacy skill is required to imagine alternative futures for sustainability that are grounded in science, creativity and values for sustainability and that includes the food/catering sector businesses. To take into account local circumstances when dealing with sustainability issues and opportunities in order to explore and experiment with innovative approaches to manage transitions and challenges in complex sustainability situations, someone should have developed adaptability and be willing to discontinue unsustainable practices and try alternative solutions. Exploratory thinking is another recognized competence in GreenComp useful to have not only to synthesise sustainability-related information and data from different disciplines, but also to engage in considering sustainability challenges and opportunities from different angles, using creativity and experimentation with novel ideas or methods.

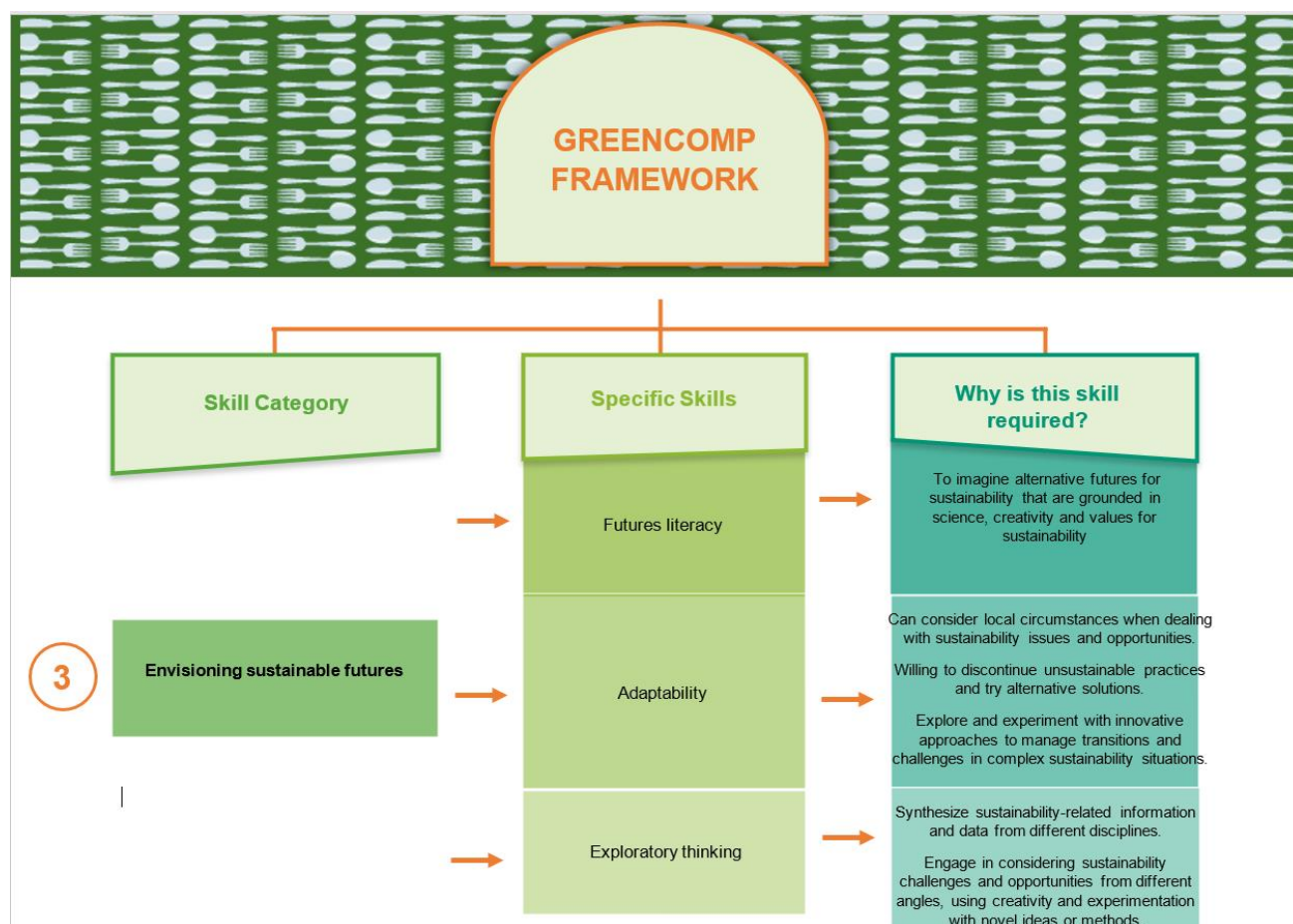


Figure 6. GreenComp mapping Part 3

To conclude with the last skill category in the mapping which represents the fourth GreenComp area, namely Acting for sustainability, three (3) specific skills were mapped in this section as important for future entrepreneurs in the field of interest. Political agency is a relevant competence to ensure future workers' capacity to identify relevant social, political and economic stakeholders in their community/region and demand political accountability for unsustainable behavior to address sustainability problems wherever they appear. Collective action comes afterwards since youth will be required to work with diverse participants to create inclusive visions for a more sustainable future and create transparent, inclusive and community-driven processes, therefore they should have a high level of team spirit and collaboration sense. Last but not least, Individual initiative is needed in these professional sectors for entrepreneurs to be capable of acting promptly, even in the face of uncertainty and unforeseen events, keeping in mind the precautionary principle and identifying their potential for sustainability with confidence about anticipating and influencing sustainable changes.

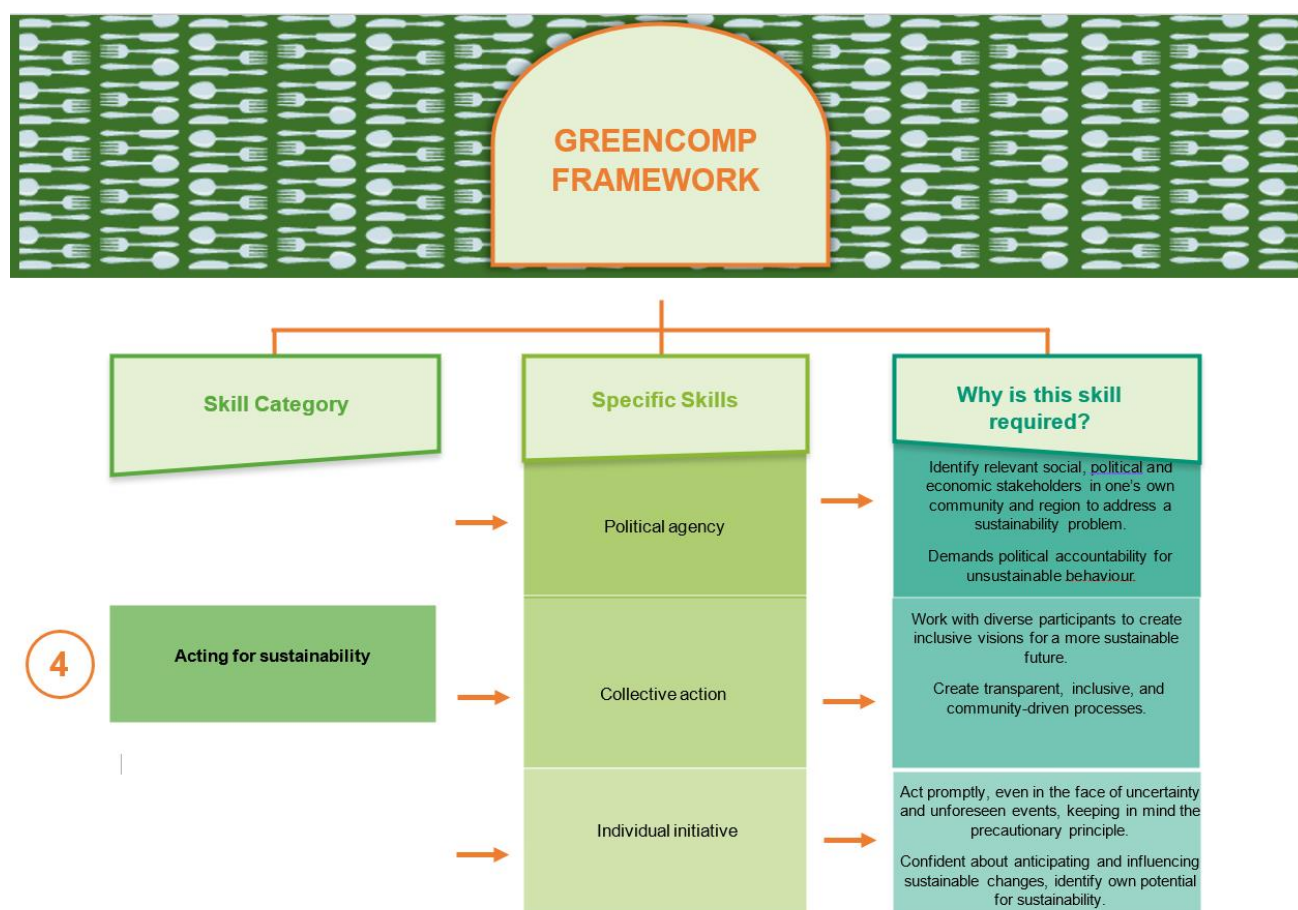
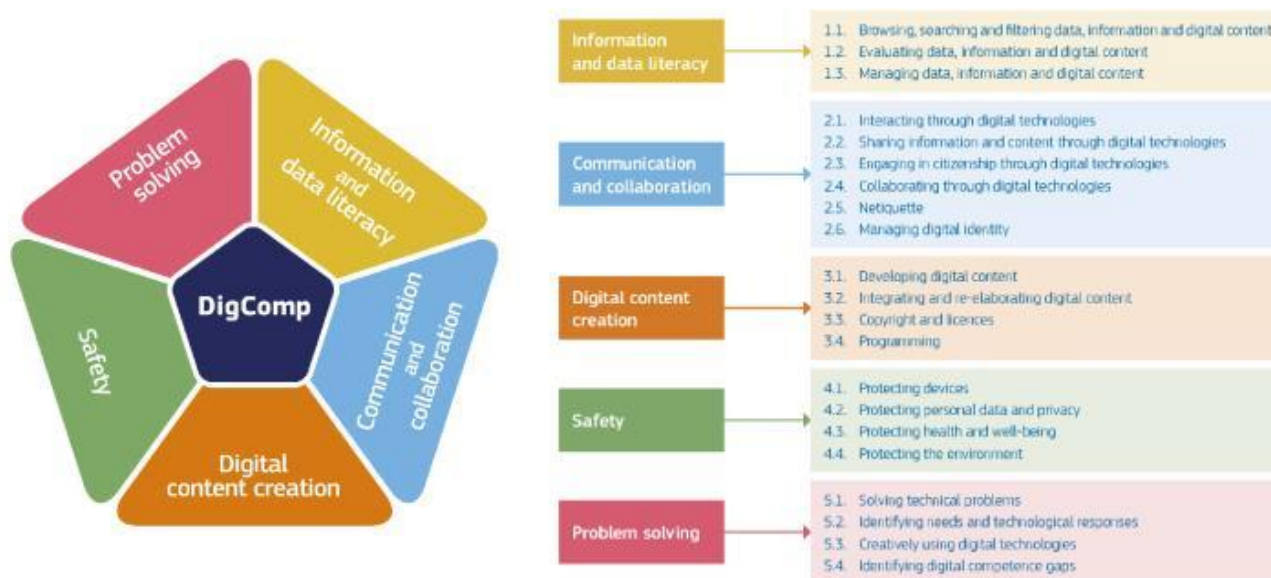


Figure 7. GreenComp mapping Part 4

The last framework that was mapped to identify skills that are indicated as crucial for young people who will become the entrepreneurs of the future is **DigComp**. The Digital Competence Framework for Citizens (DigComp) provides a common understanding of what digital competence is. It identifies the

key components of digital competence in the five areas and 21 specific competences summarised in the figures below. The framework also describes eight proficiency levels, examples of knowledge, skills and attitudes, and use cases in education and employment contexts.³ Furthermore, there is another version of DigComp, the **DigComp 2.2**, which includes further examples of knowledge, skills and attitudes regarding digital literacy of today's citizens.⁴



Source: https://joint-research-centre.ec.europa.eu/digcomp_en

WORK'S QUALITY and EHOJA school were in charge of DigComp skills mapping and collaborated to identify and record which skills are indicated as required-to-have by youth who will transform the food/catering sector by developing digital skills, among others. The categorization of competences was based on the 5 areas where the key components of digital competence belong to according to DigComp. These areas consist of the following fields:

1. Information and data literacy
2. Communication and collaboration
3. Digital content creation
4. Safety
5. Problem solving

Within the Information and data literacy skill category, the first recorded competence as required is Browsing, searching and filtering data, information and digital content, because it is important to know how to use multiple search engines and a range of strategies to develop digital literacy in the specific sector and search for data, information and content in digital environments to create personal search strategies to meet any requirements of your business. The competence of Evaluating data, information and digital content is required to strengthen the ability to compare and critically assess the digital

³ https://joint-research-centre.ec.europa.eu/digcomp_en

⁴ European Commission, Joint Research Centre, Vuorikari, R., Kluzer, S., Punie, Y., *DigComp 2.2, The Digital Competence framework for citizens : with new examples of knowledge, skills and attitudes*, Publications Office of the European Union, 2022. Available at <https://data.europa.eu/doi/10.2760/115376>

content and the sources of data, in order to determine its relevance, suitability, reliability, authenticity, accuracy, validity and currency. Managing data, information and digital content is the last competence that was mapped in this category as necessary in order to know how to organize, create, storage the workflow and retrieve data, information and content in digital environments.

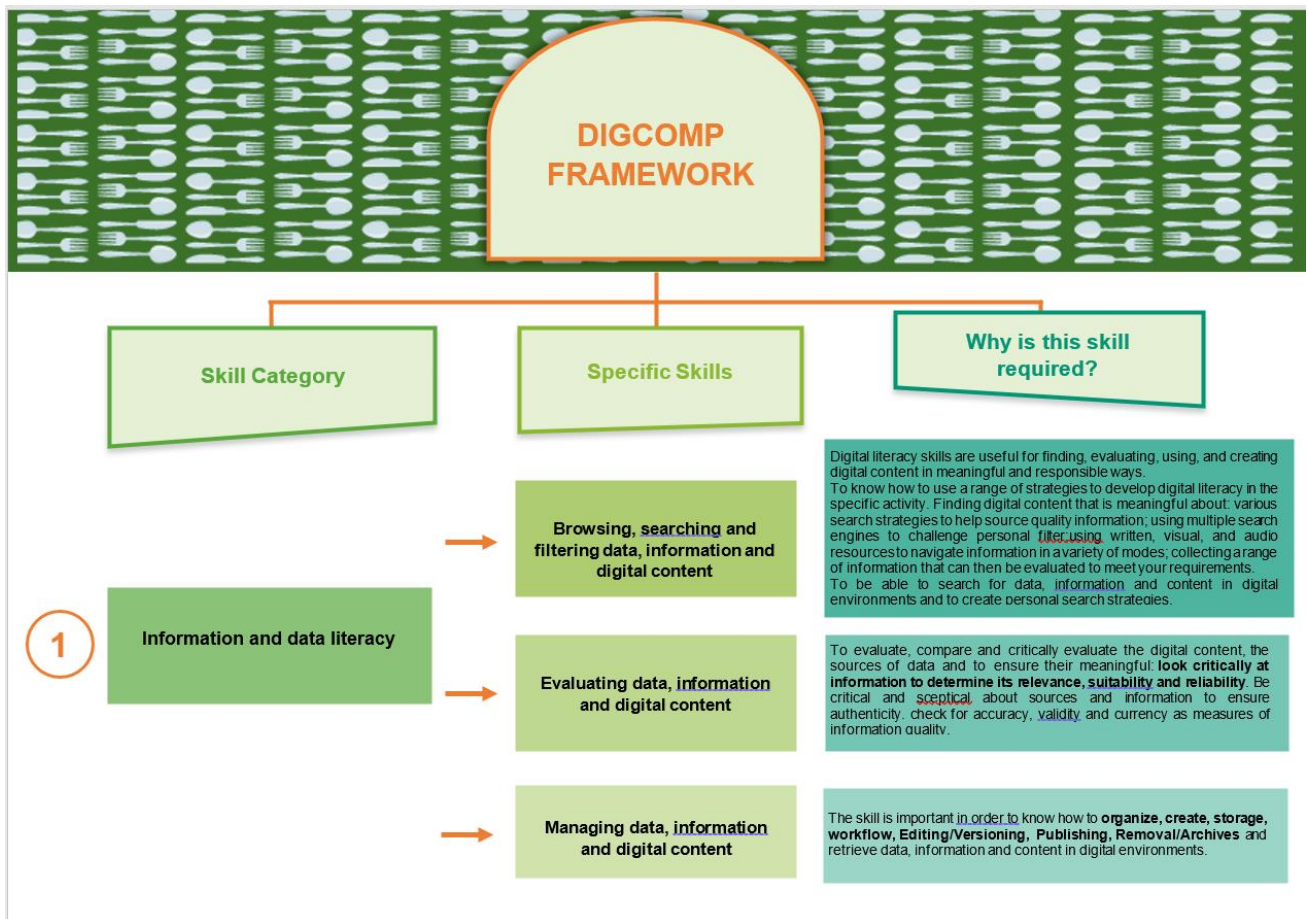


Figure 8. DigComp mapping Part 1

To continue with DigComp competences, Communication and collaboration is the second skill category from which specific competences were proposed as required. Starting with Interacting through digital technologies, it was considered as highly significant to select appropriate digital communication means for a given context, have basic knowledge on GDPR and confidentiality data protection laws, and how to protect and not collect data in a not-authorized way. As a consequence, Sharing through digital technologies is equally important in order to know how to bond with clients, promote the image of the business and to make updates on promotional items, menu content, data location and digital content; digital tools offer restaurants the chance to visually promote new or healthier options. Engaging in citizenship through digital technologies is also a required competence for participation in society through the use of public and private digital services and seeking of opportunities for self-empowerment and for participatory citizenship through appropriate digital technologies. The ability to create, analyze, exchange, and share information in a collaborative and interactive manner, translated as the competence Collaborating through digital technologies, is useful to provide insights into how to use digital tools and technologies for collaborative processes, creation and promotion of the image of the business and its products and/or services. Also, it offers the ability to solve problems, learn new things, connect, and generate new ideas. Netiquette includes being aware of not authorized data collection, adapting communication strategies to the consumers and being aware of cultural diversity in digital environments, and these elements make it an important competence for future workers in the field.

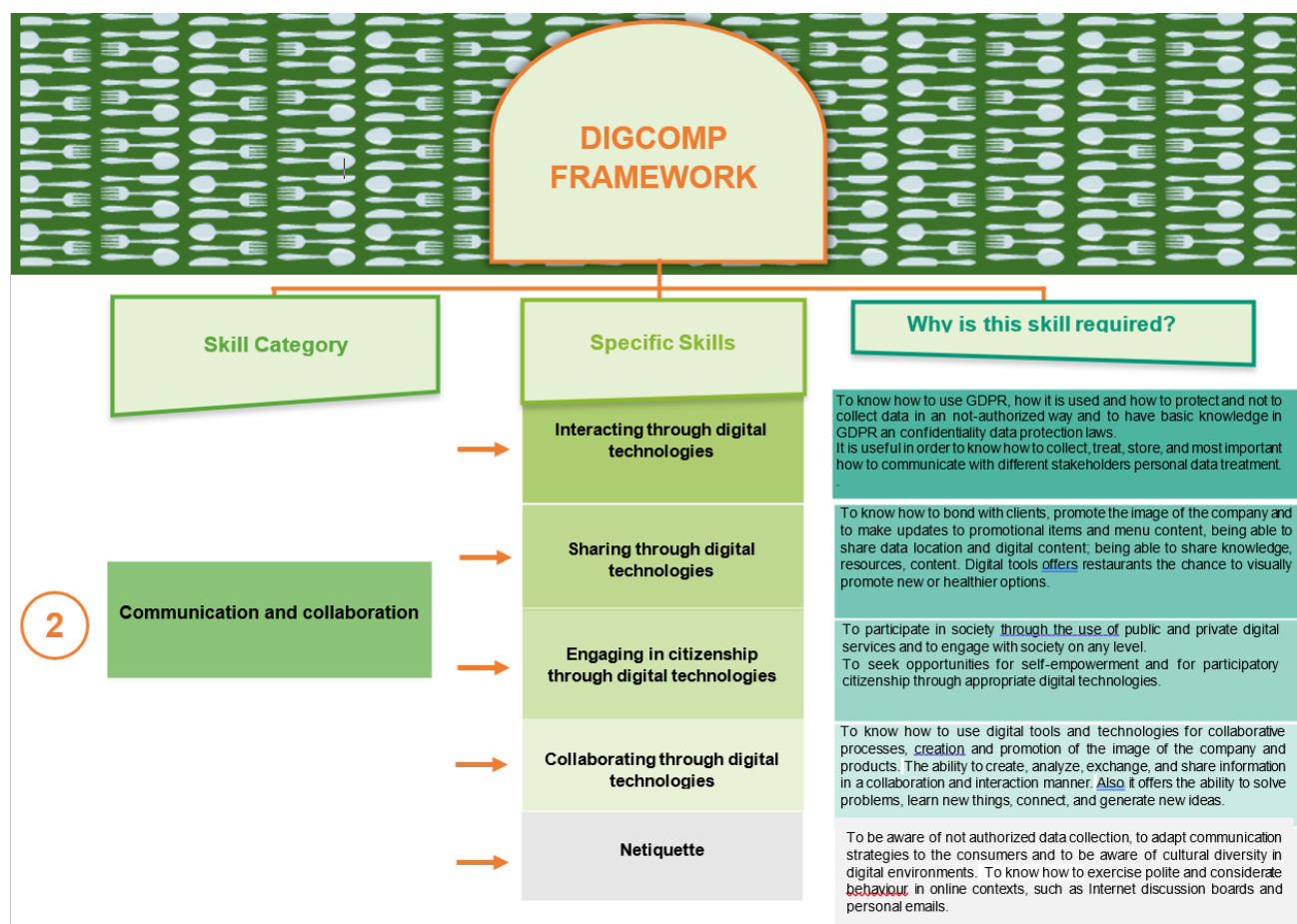


Figure 9. DigComp mapping Part 2

The Digital content creation is the next area under mapping to identify competences that need to be acquired and/or developed to meet sustainability requirements in the food/catering sector of the future. Developing digital content foresees to know how to create and edit digital content through digital formats, so as to know how to find, evaluate, use, share, and create content using digital devices, in order to correctly promote corporate values and organizational culture issues. In combination with the development of digital content comes the competence Integrating and re-elaborating digital content, which is valuable for the modification, improvement, refinement and integration of information in order to create new, original and relevant content. Knowledge on Copyright and Licenses is vital for youth to understand how they apply and adjust to data, information and digital content, be able to identify third-party materials that are protected by copyright, and recognize copyright or licensing issues and seek assistance, if needed. Programming competences might sound quite specialized for the digital skills that are needed in the food/catering sector, but they are needed in terms of knowing who to address for assistance in order to repair bugs or errors in digital systems, how to collaborate with product, design and marketing teams, and how to maintain documentation and digital organization per company standards.

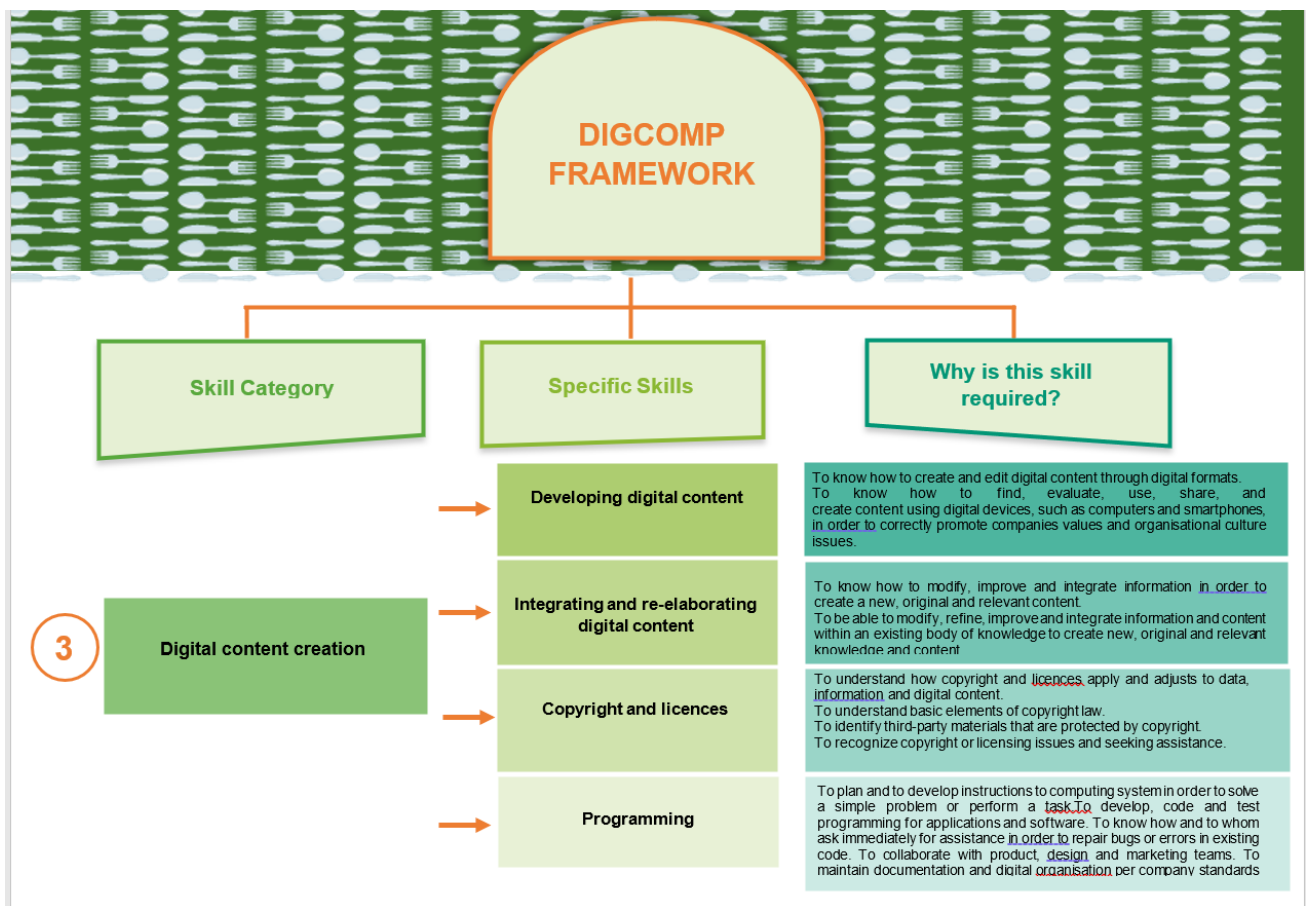


Figure 10. DigComp mapping Part 3

Safety comes next in the list with competence areas of DigComp. Protecting devices, Protecting personal data and privacy, Protecting health and well-being, and Protecting the environment are the skills that were mapped as vital for sustainability accomplishment in the food/catering sector in this area. It is significant to protect devices and digital content, to understand risks and threats in digital environments, to detect cyber threats and security measures, to understand best practices and use suitable security tools for data protection. Protecting personal data and privacy indicates the protection of these elements in digital environments and understanding of how to use and share personally identifiable information while protected. The “Privacy policy” in digital services to inform on the use of personal is also crucial for the protection of personal data and privacy. The competence for Protecting health and well-being belongs to this category because it is crucial to avoid health-risks and threats for physical and psychological well-being while using digital technologies. It is important to be able to protect oneself and others from possible dangers in digital environments (e.g., cyber bullying), too, therefore it is necessary to be aware of digital technologies for social well-being and social inclusion. Finally, youth need to be aware of the environmental impact of digital technologies and their use in order to strengthen their competences to Protect the environment.

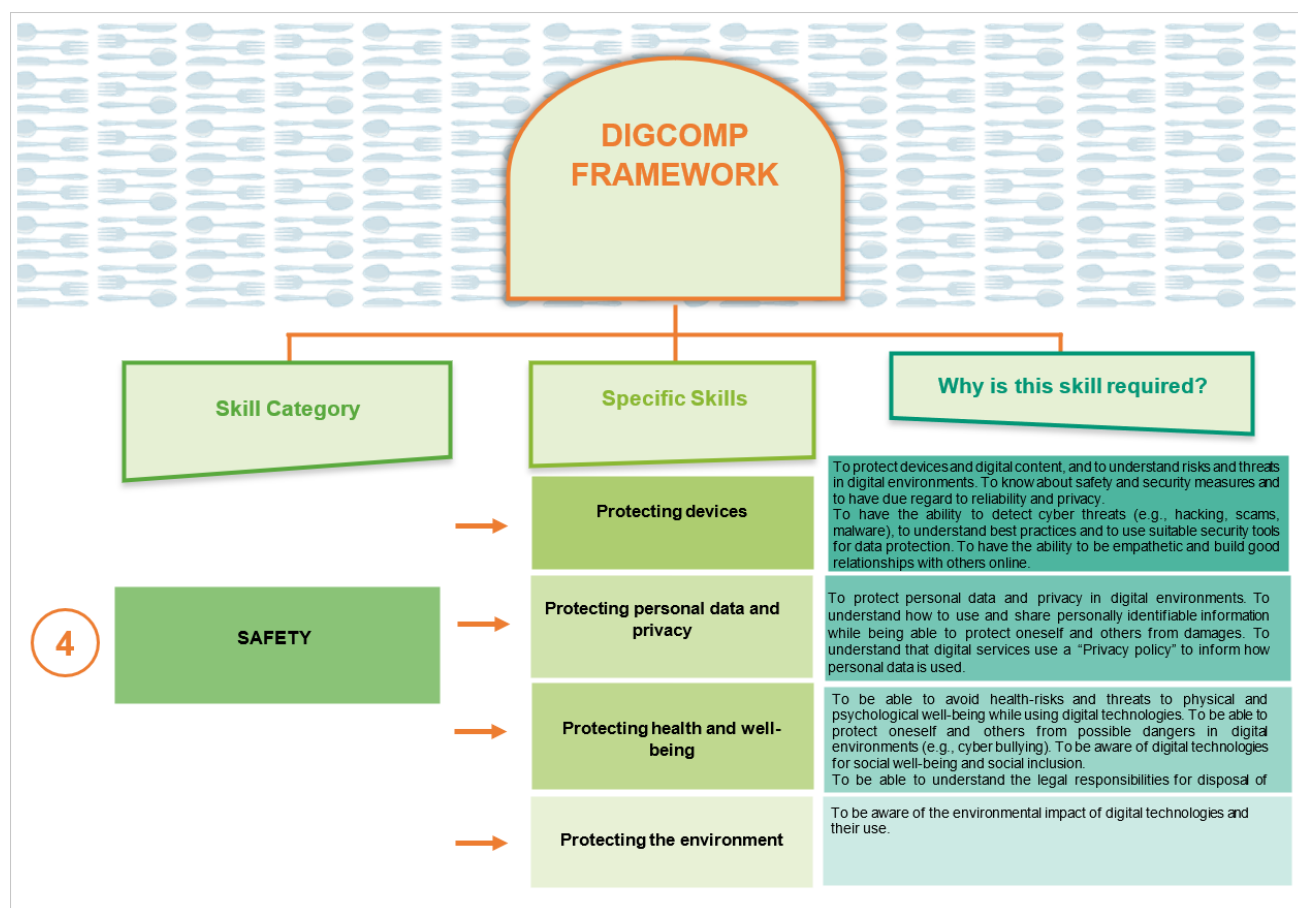


Figure 11. DigComp mapping Part 4

In DigComp, there is a whole competence area devoted to Problem solving, pointing out the significance of it in digital environments. The competence Problem framing was already addressed within GreenComp, but in this framework Problem solving attracts more attention as an area with various competences that are required. Among the included competences, one competence that was mapped as essential is Solving technical problems, needed to identify simple or complex technical problems when operating devices and using digital environments, with the aim to solve them and further find solutions to simple issues, using technology as a tool. Identifying needs and technological responses is a competence required for the assessments of needs to identify, evaluate, select, and use digital tools and possible technological responses to solve them. To use digital tools and technologies to create knowledge and to innovate processes and products. The competence to Creatively use digital technologies is needed to engage interested parties individually and collectively in cognitive processing to understand and resolve conceptual problems and problem situations in and through digital environments. Knowing how to use digital tools and technologies offers the opportunity to explore creative ideas, apply different approaches, and find new ways of displaying your work and research.

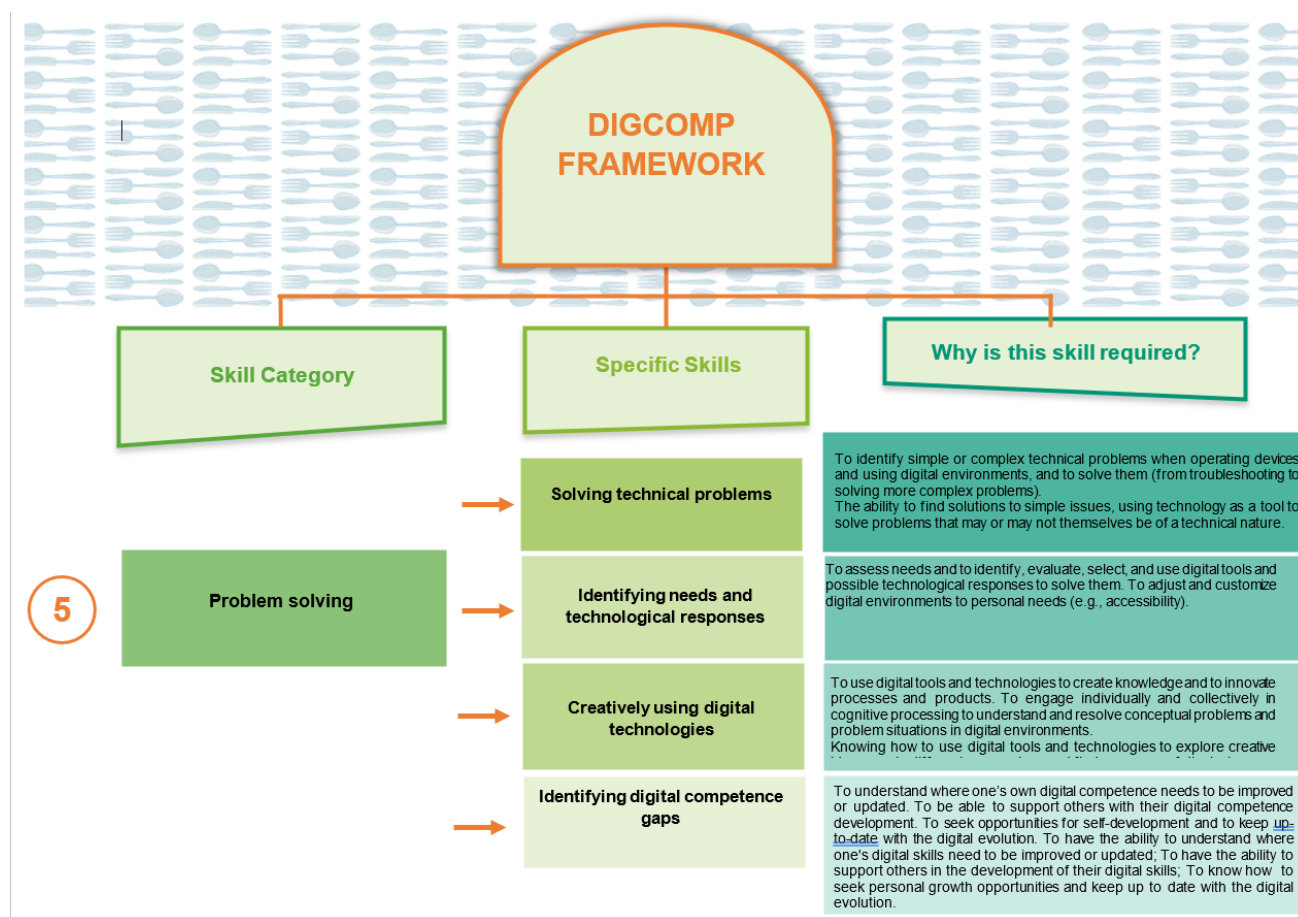


Figure 12. DigComp mapping Part 5

Finally, the **2030 Agenda for Sustainable Development** was thoroughly examined to identify which Sustainable Development Goals (SDGs) that are addressed in this framework could offer fertile ground to organize actions that will lead to higher awareness of sustainability issues and to a different way of sustainability management and assurance. *“This Agenda is a plan of action for people, planet and prosperity. It also seeks to strengthen universal peace in larger freedom. We recognise that eradicating poverty in all its forms and dimensions, including extreme poverty, is the greatest global challenge and an indispensable requirement for sustainable development. All countries and all stakeholders, acting in collaborative partnership, will implement this plan”⁵.*



Source: https://www.international.gc.ca/world-monde/issues_development-enjeux_developpement/priorities-priorites/agenda-programme.aspx?lang=eng

The food and catering sector has an important role to play in achieving the Sustainable Development Goals outlined in Agenda 2030. Specifically, the sector can make a significant contribution towards achieving Goal 12, which aims to ensure sustainable consumption and production patterns. To achieve this goal, the sector should focus on reducing food waste and promoting sustainable practices in their operations. Target 12.3, which aims to halve per capita global food waste at the retail and consumer levels, is particularly relevant to the sector. The food and catering industry can achieve this target by reducing food losses along production and supply chains, including post-harvest losses. They can also reduce food waste by adopting sustainable practices in their operations, such as recycling and reusing waste materials. Another relevant target is 12.5, which aims to reduce waste generation through prevention, reduction, recycling, and reuse. To achieve this target, the sector should focus on increasing the national recycling rate and tonnage of recycled materials. Additionally, large and

⁵ <https://sdgs.un.org/2030agenda>

transnational companies in the sector should integrate sustainability information into their reporting cycle, as per target 12.6.

Goal 4, which focuses on quality education, is also relevant to the sector. Target 4.4 aims to increase the number of youth and adults with relevant skills for employment, decent jobs, and entrepreneurship. To achieve this target, the sector should focus on developing green, digital, and entrepreneurial skills in new employees. Additionally, target 4.7 encourages the mainstreaming of education for sustainable development in national policies and curricula, which can help ensure that all learners acquire the knowledge and skills needed to promote sustainable development.

The sector can also make a contribution towards achieving Goal 6, which focuses on clean water and sanitation. Target 6.4 aims to increase water-use efficiency and ensure sustainable withdrawals and supply of freshwater. The sector can achieve this target by focusing on improving water-use efficiency and reducing water stress in their operations.

Finally, the sector can contribute towards achieving Goals 8, 11, and 13. Goal 8 focuses on decent work and economic growth, and targets 8.3 and 8.4 aim to promote entrepreneurship and innovation while improving global resource efficiency. Goal 11 focuses on sustainable cities and communities, and target 11.6 aims to reduce the adverse per capita environmental impact of cities. Goal 13 focuses on climate action, and target 13.3 aims to improve education and awareness on climate change mitigation and adaptation. By adopting sustainable practices and promoting green, digital, and entrepreneurial skills, the food and catering sector can make a significant contribution towards achieving these goals.



TRANSFORMING OUR WORLD:



THE 2030 AGENDA FOR
SUSTAINABLE DEVELOPMENT

Activity 2 Analysis of skills acquired in the initial VET courses in the catering sector

Skills mapping through VET curriculums

As already mentioned, the objective of WP2 is to facilitate the evaluation and recognition of the competences acquired by the learners during the training program and other project activities through the use of an innovative evaluation tool. Before this stage, the skills currently acquired in VET courses in the food and catering sector, especially regarding green, digital and entrepreneurial competences, were identified in Activity 2 through skills mapping in the applied curriculums of participating VET schools.

For this, the partners that are VET schools requested to use their curriculums to review and identify what skills are targeted to be developed through VET courses in the young learners of the VET school. This information will be fundamental for the analysis of the skills gap between the desired and targeted competences for food/catering sector by employers and frameworks and the competences that are deployed in VET education for food/catering sector. Using the same template for skills mapping

through frameworks, VET school partners submitted to the WP leader categories of skills and which specific skills are addressed within the educational organization they represent and why.

The case of AKMI follows. It is the VET center from Greece, and they categorize the skills taught into **Technical skills** and **Entrepreneurial and Managerial skills**. The Technical skills cover a variety of knowledge pieces, such as technical knowledge on the equipment, on cooking and pastry techniques, and on International and local cuisine. The ability to operate utensils and machinery within a restaurant business, basic cooking and pastry techniques (e.g., cutting, baking, blending, binding, creaming etc.), and knowledge of recipes from the most important and influential cuisines around the world, as well as local cuisine, are fundamental pieces of knowledge that anyone who wants to be involved in the food/catering sector must have acquired before progressing to other skills acquisition.

Moving on with the Entrepreneurial and Managerial skills addressed in the curriculum of AKMI, five (5) main categories were identified as required in terms of which young people's skills should be enhanced, so as to be able to correspond to food/catering sector needs. It is apparent that these categories are interlinked with the already mentioned technical skills, due to the fact that the courses in this sector concern very hands on knowledge and activities. Competences for Organization and Management of a Restaurant business are indispensable because they provide the knowledge for a successful restaurant business. Furthermore, from a sustainable aspect, the efficient operation of the restaurant results in less waste of materials, thus it is one aspect of skills offered through the curriculum. Commodity Control is a core process for many enterprises, let alone in the food/catering sector, to ensure the high quality of provided products and/or services. Ensuring skills for students to keep track of commodity control provides the necessary knowledge to make a qualitative and economic assessment of the products (raw materials, consumables, etc.). Quality Assurance is part of this control, so young people will be able to develop monitoring skills to implement Quality Assurance with suppliers, in the supply chains, in more environmentally friendly materials and many more.

The knowledge of basic principles of economic theory, such as supply and demand, and the skills to make use of it, is called Basic Economics here. Students in this VET school acquire the necessary knowledge for the financial operation of a restaurant (taxation, balance sheets, etc.). With basic economic knowledge the interested parts will be capable of identifying waste, e.g., in energy, and reducing them, and as a result reduce the environmental footprint. Next comes the theme of Hygiene and Safety, for which knowledge and competences are addressed in the curriculum of AKMI VET center. Quality assurance of hygiene and safety standards in a restaurant (cleanliness in vulnerable areas such as the kitchen and refrigerators) is required for the proper and correct operation of the restaurant horizontally. The safety sector in a restaurant can promote the use of tools and materials to enhance green practices. Last, Food and Beverage Management is a key process in the food/catering sector, therefore it could not be omitted from the skills development aspect. Food and beverages are among the main products (if not the only) that are offered in restaurants, therefore key strategies and practical skills necessary for managing, owning, and operating a successful food and beverage business are envisaged in the learning material of the curriculum. Knowledge in this sector can help in the use of products that are more environmentally friendly, as well as in their promotion to customers.

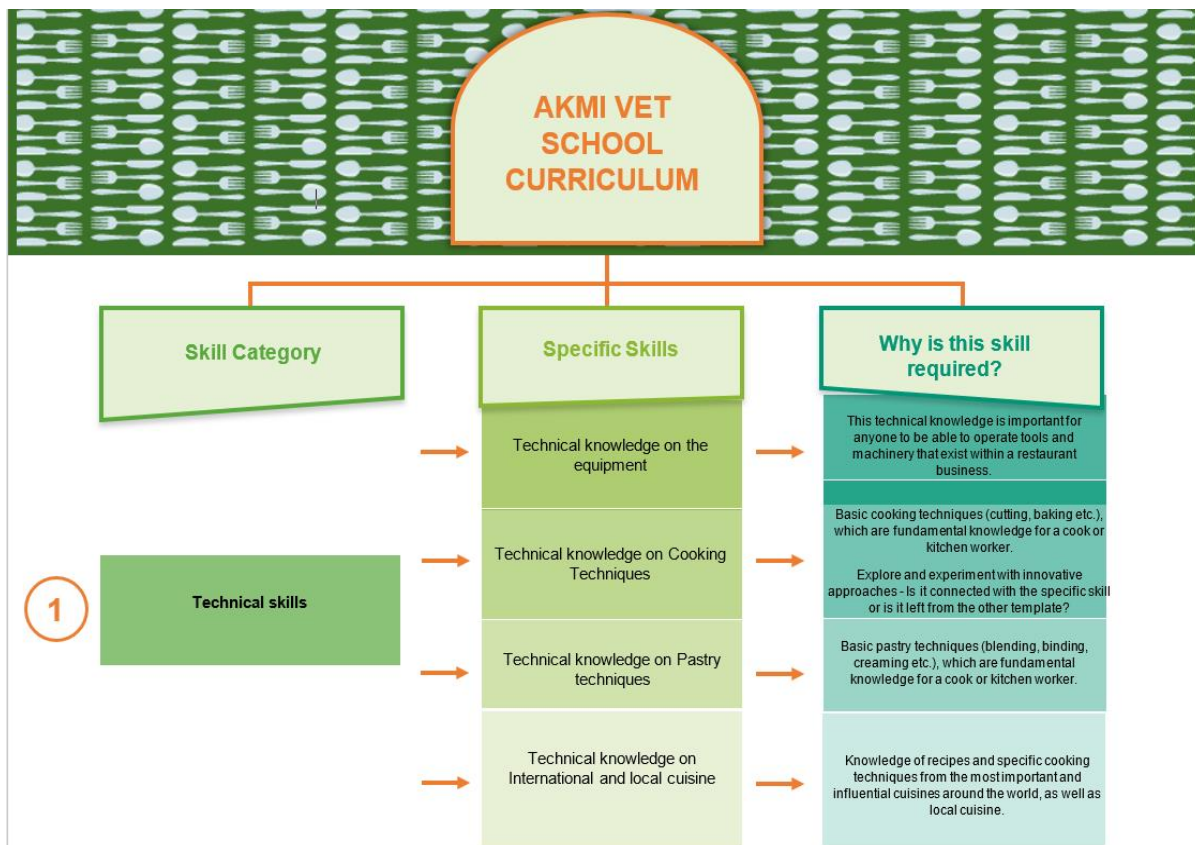


Figure 13. AKMI Curriculum mapping Part 1

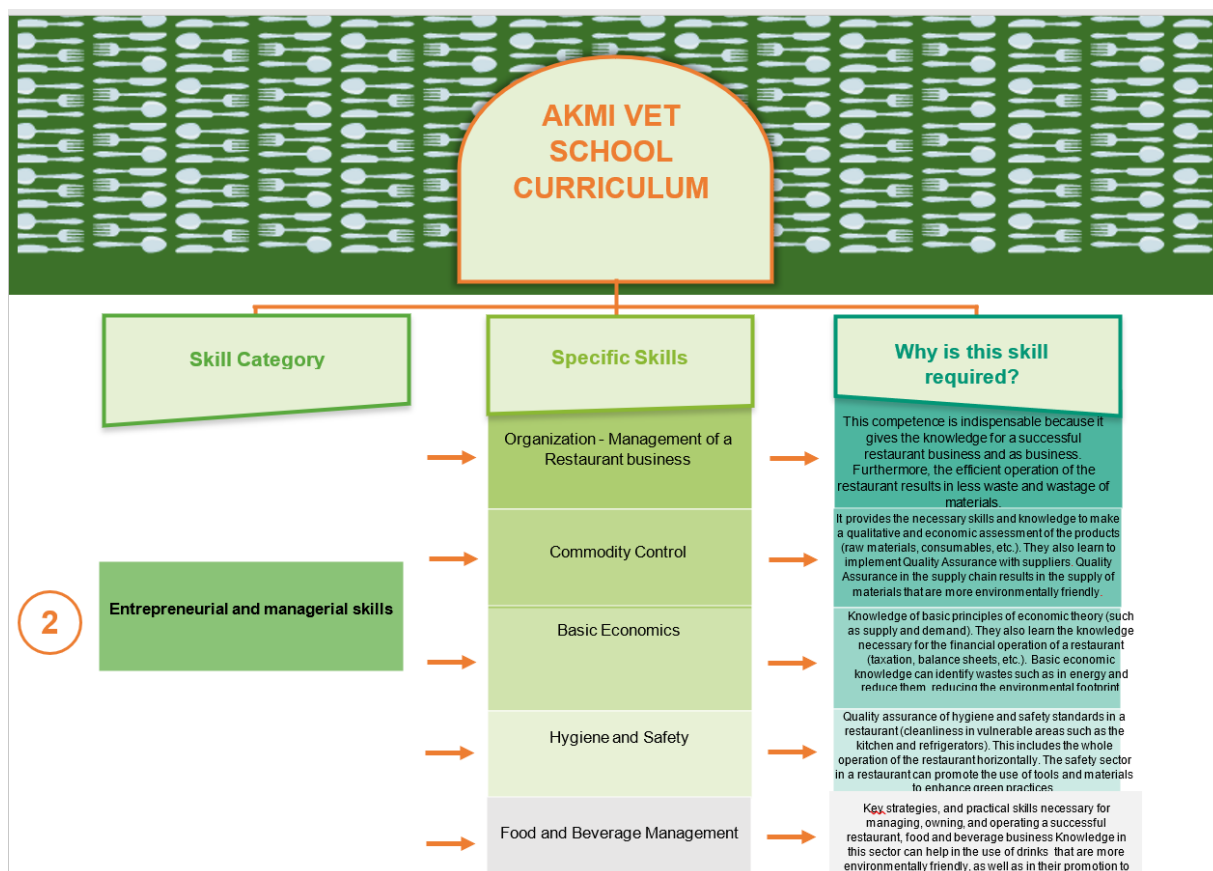


Figure 14. AKMI Curriculum mapping Part 2

The skills addressed in the curriculum of the VET school AMAR TERRA VERDE were also divided into two (2) categories: 1. Technical skills and 2. Entrepreneurial and managerial skills. Furthermore, it can be seen in the figures below that AKMI and AMAR TERRA VERDE have some skills fields in common. More specifically, in the field of Technical skills, all competences that are mapped to be addressed in the VET school from Portugal concern the need for knowledge on equipment, cooking and pastry techniques, and international and local cuisine. This technical knowledge is important for anyone to be able to operate tools and machinery that exist within a restaurant business, to deliver international and local traditional dishes. Preparation and cooking of appetizers, starters, main courses, desserts, along with cooking mixes, pasta, fish and shellfish, meat and poultry, doughs, fillings, and many more, are also procedures that demand expertise and an adequate level of operational skills. The only addition in this curriculum regarding technical skills is the Communication Techniques that demand more skills to be developed. The use of English in the kitchen and pastry, as well as in the fields of tourism and hospitality in the region generally, are mandatory to collaborate with colleagues of various origins and serve customers from various backgrounds.

Regarding Entrepreneurial and managerial skills addressed within the VET curriculum of AMAR TERRA VERDE, similarities with the skills addressed in the Greek school are noticed. To begin with, special services need to be designed during the kitchen/pastry organization and the production planning, so the involved workers should have knowledge and creative skills to correspond to this need, in order to make their business unique and competitive. Competences for Commodity Control are also foreseen in this curriculum since they will ensure the necessary skills and knowledge to make a qualitative and economic assessment of the products (raw materials, consumables, etc.) to be used in a restaurant and implementation of Quality Assurance with suppliers. Moreover, competences around Economics, such as dealing with economic problems, search of markets for goods, services and productive factors, knowledge on currency, financing, growth, development and fluctuations of economic activity, comprise another set of soft skills that are common in the VET curriculums. About Food technologies, hygiene and safety are topics that require management skills and proactiveness in catering and rational eating, nutrition and dietetics, ensuring the cleanliness and tidiness of spaces, equipment and service utensils. Management and control competences is the last area addressed by the curriculum, covering indicatively cost control in catering, team management, communication skills, sales and complaints handling, use of capitation, technical sheets, letters and menus.

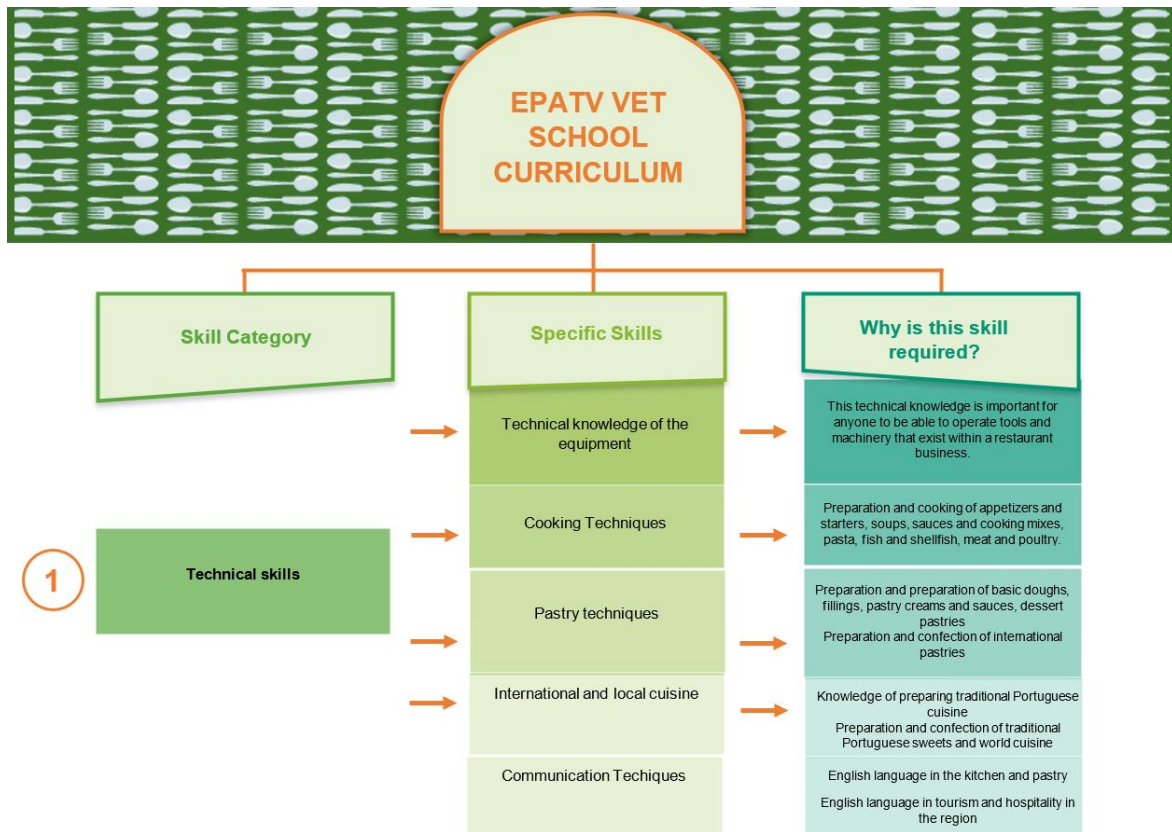


Figure 15. AMAR TERRA VERDE Curriculum mapping Part 1

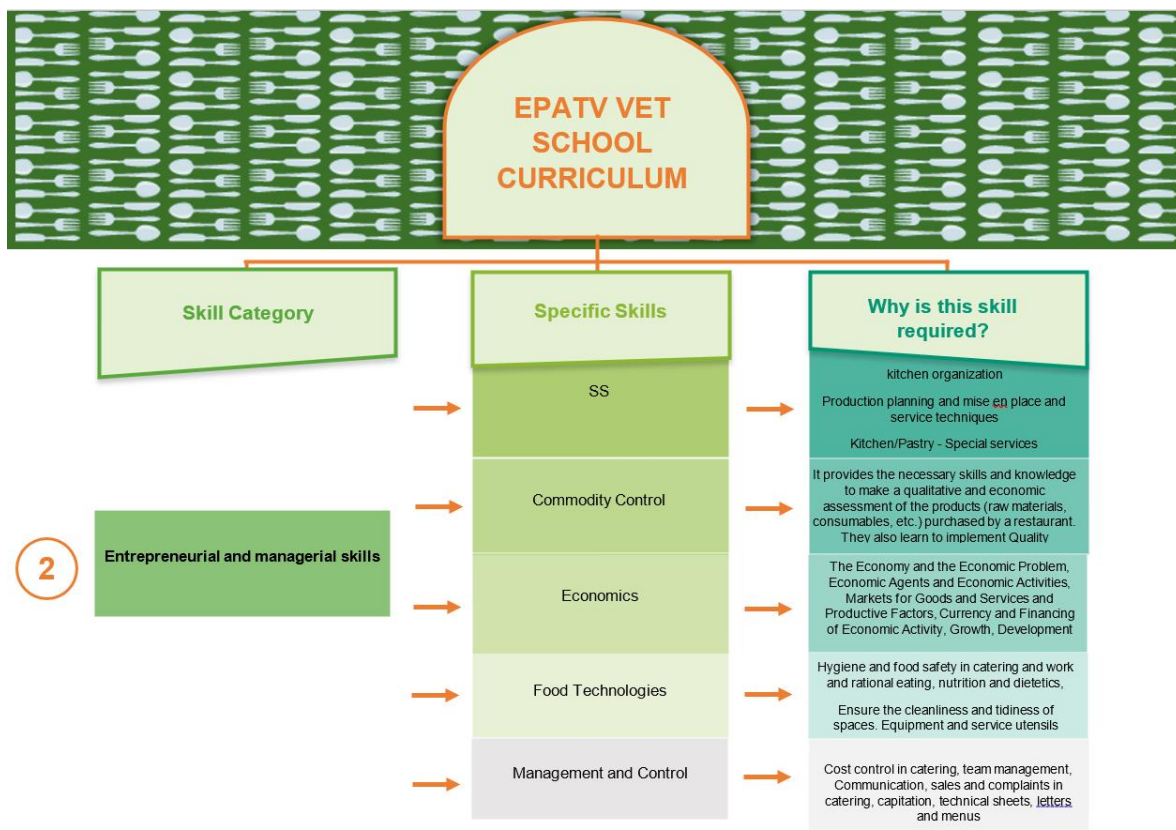


Figure 16. AMAR TERRA VERDE Curriculum mapping Part 2

The next curriculum that was mapped for the competences that are addressed in VET education is applied in the VET schools CMFP Marino and CMFP Castelfusano in Italy. The schools share a vision of which skills and knowledge are required for the future workers in the food/catering sector, so they follow the indications and requirements of a common curriculum. The first mapped competences are related to general technical skills, namely foreign languages use, law and economics application, tools selection, and IT procedures. Being able to interact, communicate, share information/content, present information and arguments in various situations, apply modes of communication in multicultural/multilingual contexts, both in physical and online environments, is an asset for young workers, so the knowledge of a foreign language is included in the curriculum. Get and manage the competences needed at any stage, including technical, legal, tax and digital competences is vital for young students to be able to identify types and models of businesses and recognize how a business becomes an enterprise, along with the essential characteristics of a work relationship and the related rights/obligations. By having technical, legal, tax and digital knowledge they will grasp the specific identity/professional ethics of the field and job and the elements of innovation in the economic-productive processes and systems promoted. The acquisition of know-how to use various techniques and tools in the field is useful to apply procedures and techniques to set up equipment, machinery, industry tools, adopt methods and behaviors for routine maintenance, and use methods to identify wear levels and possible malfunctions. Skills are needed and thus addressed in the curriculum for the interaction, communication, and exchange of information/content through digital technologies (IT procedures) in order to prepare future workers to use the language of the Internet, recognize opportunities and risks in the use of ICT, be aware of the rules of IT communication and of types of data and functions in Office tools.

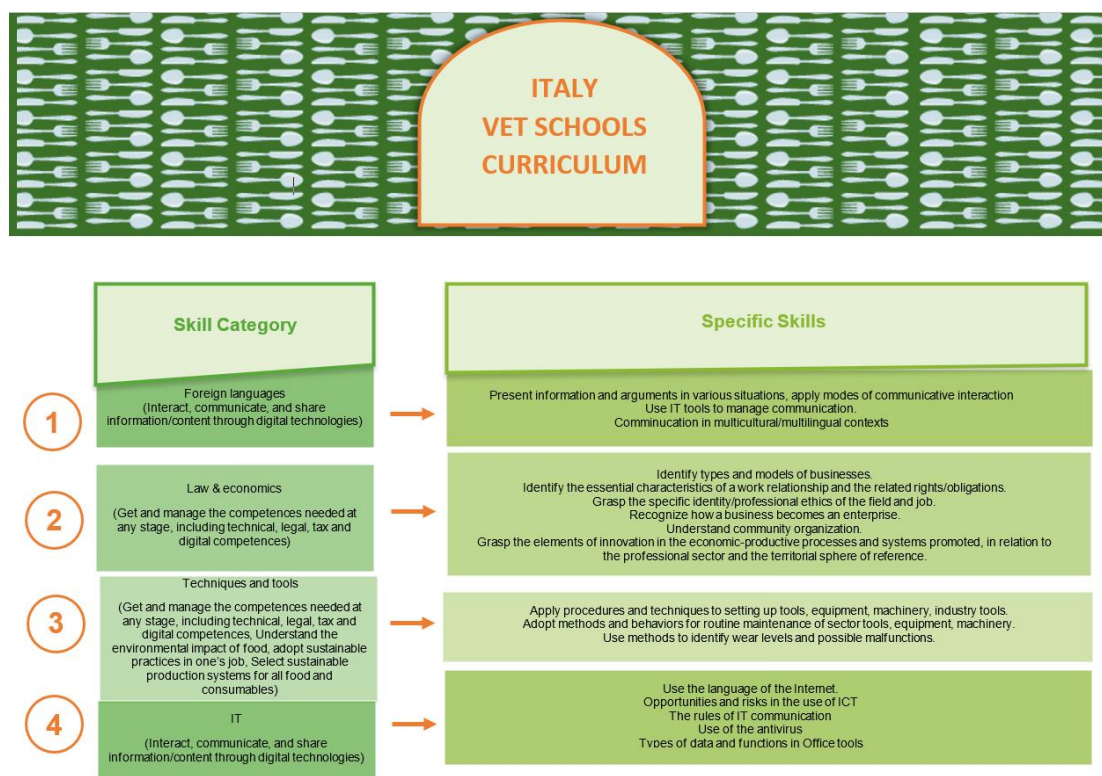


Figure 17. Marino & Castelfusano Curriculum mapping Part 1

In the next parts of the curriculum mapping, the competences that were identified concern entrepreneurial skills, including the areas of Entrepreneurship skills and Business management, and skills on the implementation of critical components of a food/catering sector business, including the areas Safety in the workplace, Nutrition principles and science, Ecology and sciences, Preparation of dishes, as shown in the figures below.

Starting with Entrepreneurial and Business management skills, they are of paramount importance since the students of today will become the entrepreneurs of tomorrow, thus they will be supported on how to develop skills for vision planning and decision-making processes, to build an action plan and medium/long term strategies, to analyze and assess options based on desires and values, to be aware of professional needs and goals, to detect job characteristics distinguishing among different occupations, to adopt social and professional behaviors, and make vocational choices of job specialization. Also, within a business the involved parts should have knowledge and competences to manage and plan purchases, warehouse, and personnel, select raw materials, products, and suppliers, deal with accounting issues, technologies applied to the catering industry, and relevant legislation.

Furthermore, the field of Safety in the workplace entails to know and be able to apply the environmental rules and certification criteria in the food service industry, so as to adopt work behaviors coherent with the safety and hygiene rules and with the environmental sustainability and protection in the food sector. Nutrition principles science is an important aspect of the food/catering industry and what must be known in their terms includes the ingredients that have the highest environmental impact, the correlation between health and sustainable food, how to create a menu focused on seasonal ingredients, produced locally, using smaller amounts of animal products in dishes and expanding plant-based dishes etc. Subsequently, knowledge is shared during VET courses on how to stock and preserve food, and how to prepare a healthy and balanced menu, dishes for people with food intolerances, based on the basic principles of chemistry and physics in food processing. Last but not least, Ecology science is equally important for that it includes insight on principal relations and problems between humans and environment, understanding of the environmental impact of food, recognition of the correlation between health and sustainable food, and comprehension of the scientific relationships between ecological systems, biogeochemical cycles, and human activity. In turn, these elements are important to:

- Promote the value of biodiversity and abiotic resources.
- Adopt and develop environmentally sustainable choices in a work area, in line with the objectives pursued by current European regulations.
- Undertake the correct strategies to limit environmental pollution and reduce waste of natural and food resources.
- Respect the entire waste management process to counter the effects of pollution on human health and the environment.
- Recognize the importance of sustainable choices for the environment, society, and economy.

- Know how to understand and use appropriate scientific terminology, be able to critically analyze information on the most pressing environmental issues, and act by developing effective strategies to counter ecological damage.
- Be aware of the importance of the restaurant operator's role in the conservation of land resources.

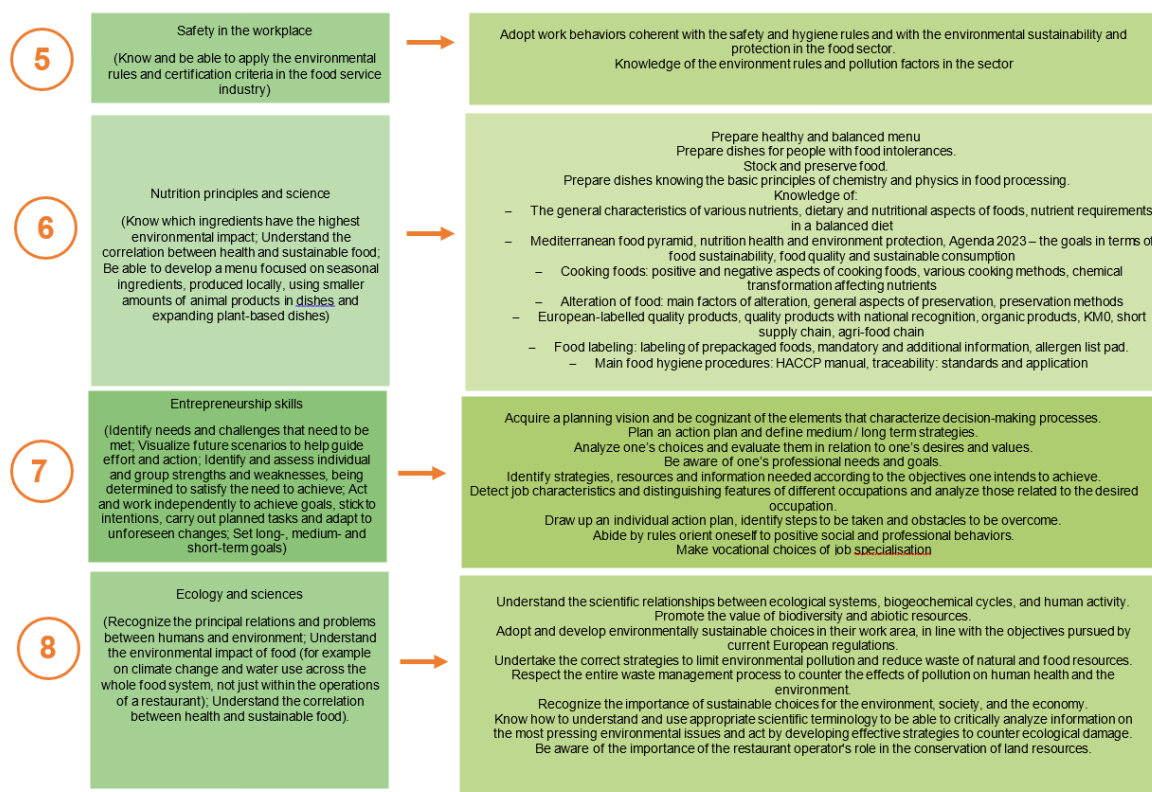


Figure 18. Figure 17. Marino & Castelfusano Curriculum mapping Part 2

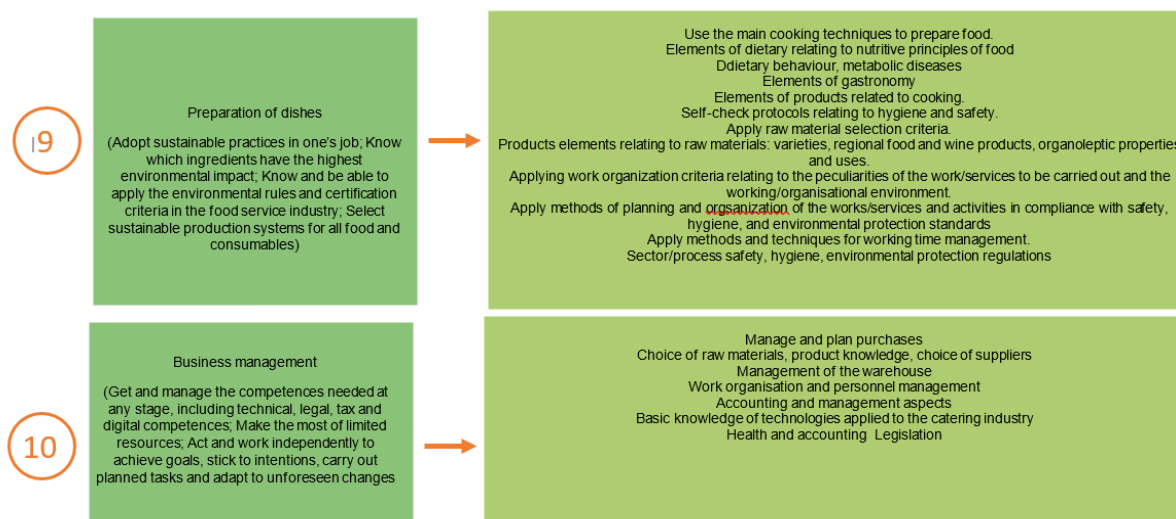


Figure 19. Figure 17. Marino & Castelfusano Curriculum mapping Part 3

The last VET curriculum where skills addressed were mapped for students in courses regarding the food/catering sector is from EHOJA school in Spain (CENTRO INTEGRADO PÚBLICO DE FORMACIÓN PROFESIONAL CAMINO DE SANTIAGO) and the skills were also divided into two (2) categories, Technical and Entrepreneurial/managerial skills, as can be shown in the figures below.

Initiating with technical skills, among the most important ones that are addressed in EHOJA school curriculum are to modify technical specifications based on market demand, acquire and store materials in accordance with product characteristics and safety regulations, regulate production equipment and systems to meet production process requirements following the procedures manual, perform stock control to maintain their integrity during distribution and marketing, conduct basic checks and record results, prepare and maintain equipment and facilities to ensure quality, safety, and efficiency while upholding hygiene standards, advertise and promote products through marketing and commercialization techniques and ensure traceability and product safety by following food safety regulations.

The most important entrepreneurial and or managerial competences intended to be developed through VET courses are to be able to follow labor, environmental safety, hygiene, and quality protocols throughout the entire production process, utilize relevant information and communication technologies to correctly carry out invoicing and/or collection processes and exercise their rights and fulfill their obligations as specified in current legislation, use established rules and procedures within their authority to solve problems, related to customers or other, and make independent decisions, actively participate in economic, social, and cultural life with a critical and responsible attitude, achieve production objectives while adhering to the principles of responsibility and maintaining appropriate professional relationships with the work team members, foster a spirit of innovation and continuously improve production processes while staying up-to-date with knowledge in their field, develop an entrepreneurial culture and adapt to various job opportunities, including self-employment, by identifying and analyzing employment opportunities in order to establish and manage a (small) business.

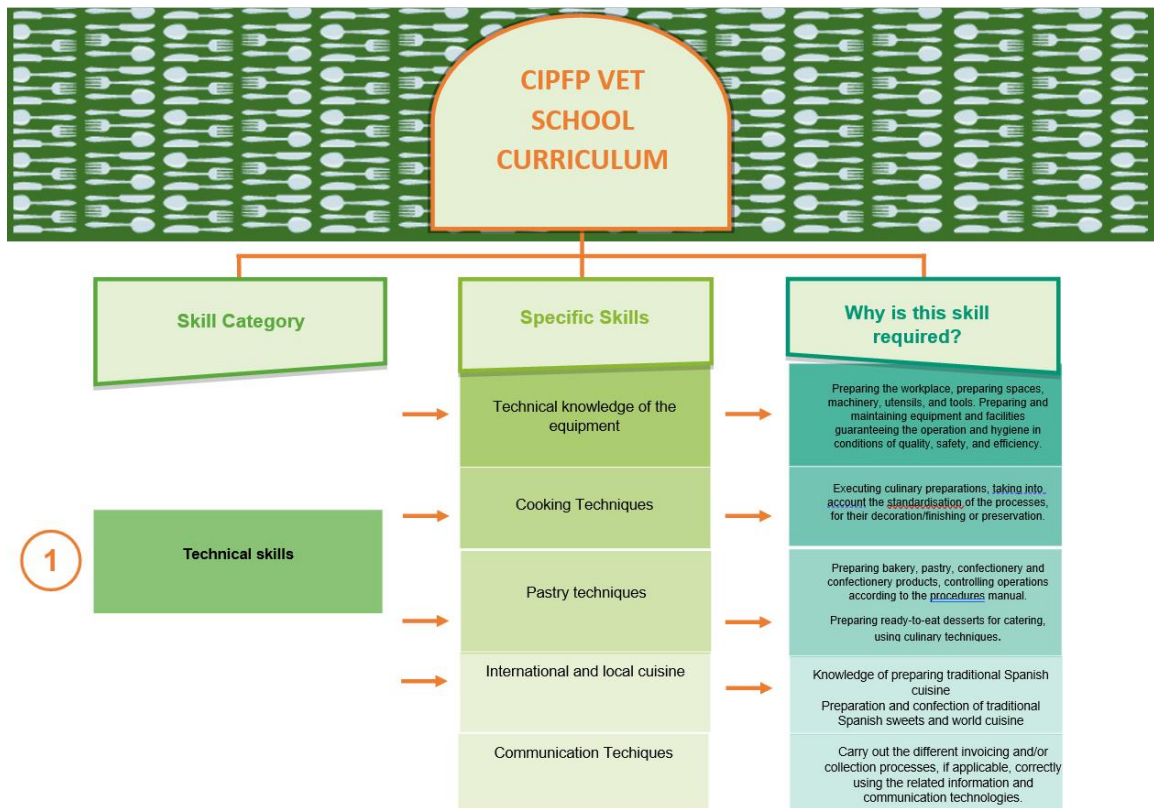


Figure 20. EHOJA school Curriculum mapping Part 1

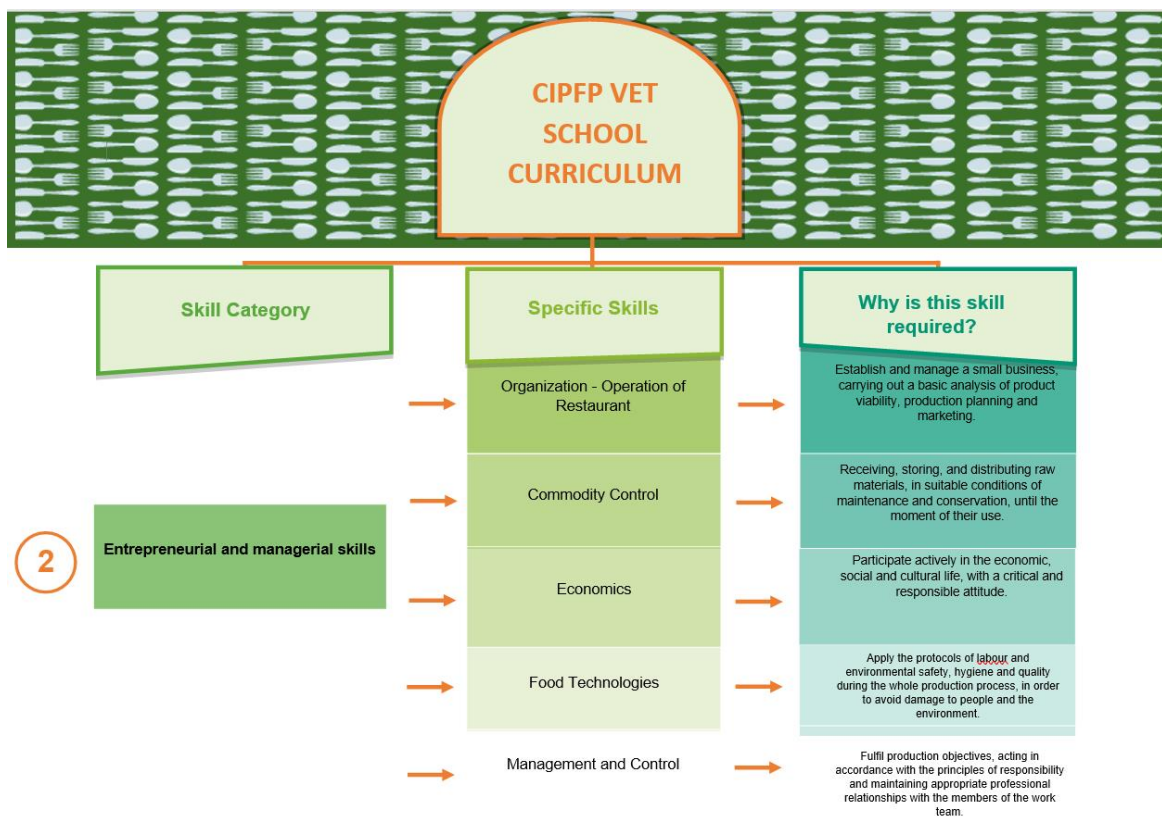


Figure 21. EHOJA school Curriculum mapping Part 2

Drawing upon the information presented, it can be inferred that the food and catering industry necessitates proficiency in two principal skill categories: technical skills and entrepreneurial and managerial skills. Technical expertise is critical for the operation of utensils and equipment, proficiency in fundamental culinary and pastry techniques, and familiarity with recipes from both local and international cuisines. Conversely, the successful management of a restaurant business requires entrepreneurial and managerial skills encompassing organization and administration, inventory management, quality assurance, rudimentary economics, hygiene and safety protocols, as well as food and beverage management.

Overall, VET schools play a crucial role in addressing the skills gap between the desired and targeted competences for the food and catering sector by employers and frameworks, and the competences that are deployed in VET education. By providing the necessary technical and entrepreneurial and managerial skills, VET schools can help prepare young learners for successful careers in the food and catering sector.

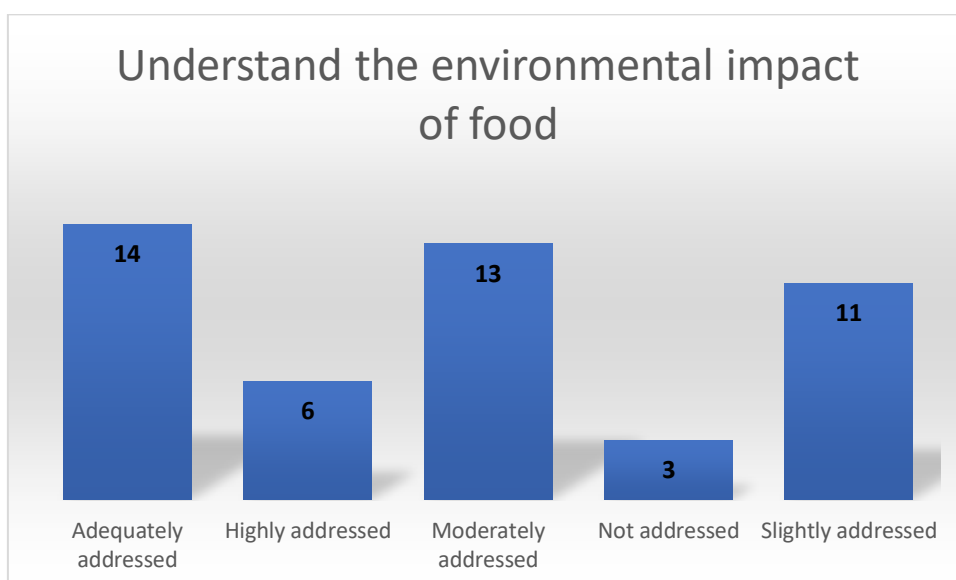
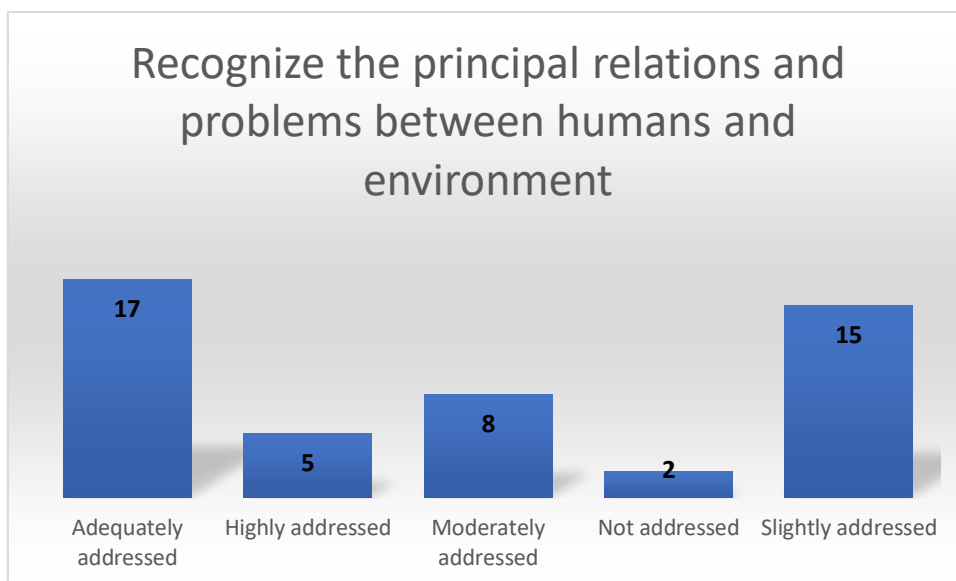
Survey in VET teachers

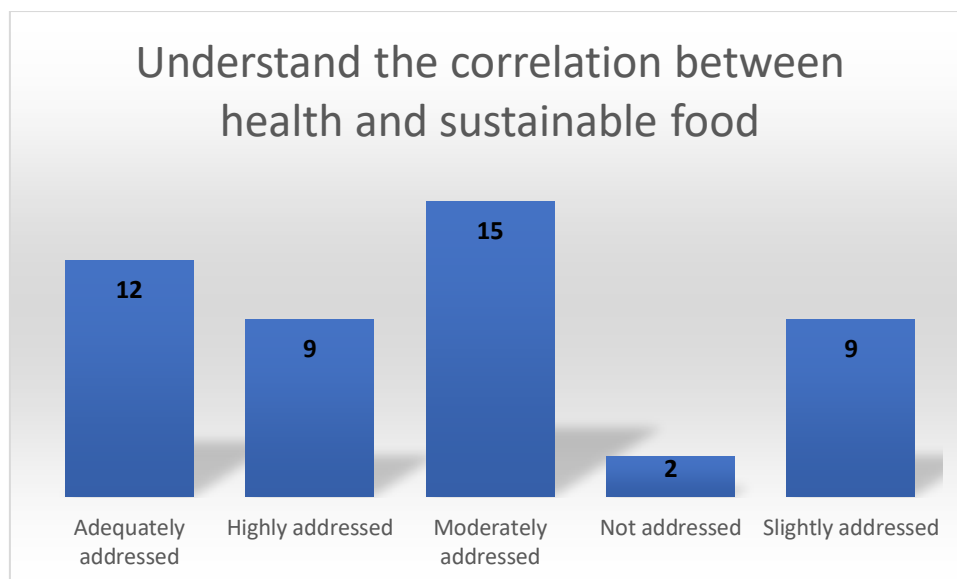
The last part of Activity 1 includes the results of a survey that took place with the contribution of teachers in VET schools who are also engaged in the implementation of SSPICE IT project and especially its activities that concern the field of VET education. The main aim of this survey was to explore and discover which competences are addressed by teachers during the VET courses, even though these competences might be addressed in the VET curriculums or not. In many cases it is noticed that teachers take initiatives to enhance students' knowledge and skills in other aspects and ways besides the defined and structured curriculum and studies that are followed in a VET school. For this reason, it was considered essential to define the sustainability, digital and entrepreneurial competences that are addressed by the teachers within the educational environment of their VET courses. A questionnaire was created and shared to compile answers by this target group (Annex 2) and it was also designed based on GreenComp and EntreComp, with the degree of competences addressed to be rated on a Likert scale from 1 to 5.

In total, 47 questionnaires were compiled from the partner countries Italy, Spain, Portugal, Greece, from which VET schools participate in the project as partners, and from Romania that approached interested stakeholders for this task. The majority of the respondents were teachers that are employed in the VET school that teach either specialized subjects in the department of food and catering studies, or more general subjects, such as foreign languages, finances, mathematics etc. There have also been some respondents who are teachers but are also involved in the administrative section of the department. All the VET schools from which teachers come from have more than 100 students, with some of them reaching up to 5000.

The questionnaire began by focusing on **Sustainability** as the primary topic, particularly on the topic of "**Understanding of sustainability challenges**". Based on the charts provided, it appears that recognizing the key relationships and issues between humans and the environment, comprehending the environmental consequences of food, and understanding the link between health and sustainable

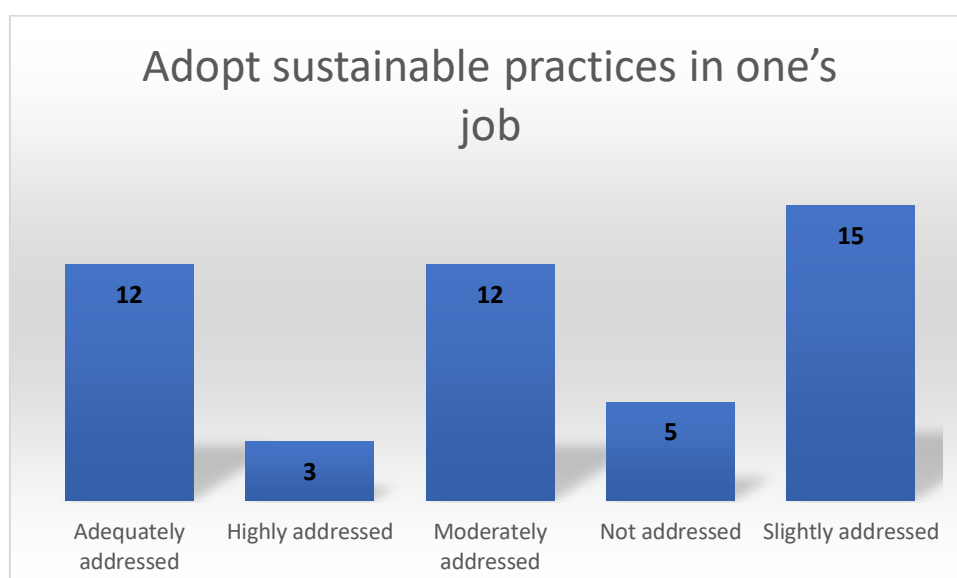
food are all addressed from slightly up to adequately by the majority of VET teachers. These rates indicate that educators are not highly committed to include these competences in their VET courses.



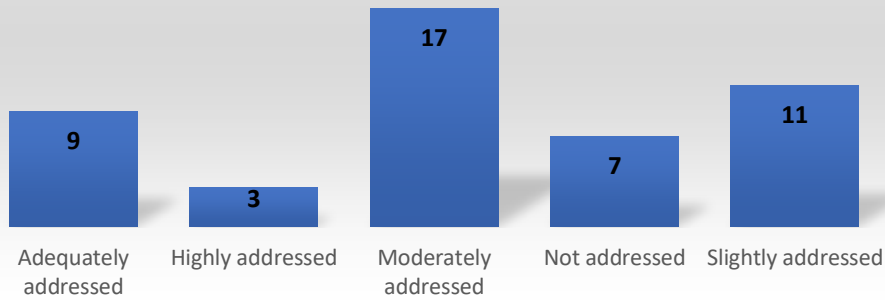


To assess the level of being aware of **Sustainable Practices**, the teachers were required to respond on what degree they (try to) address somehow the competences that are included in this section and are the following: adopting sustainable practices in their occupation, understanding and applying environmental regulations and certification criteria, recognizing the ingredients with the greatest environmental impact, implementing measures that align with sustainable waste management, creating a menu that emphasizes seasonal ingredients and other similar sustainable modifications, and selecting sustainable production systems for all food and consumables.

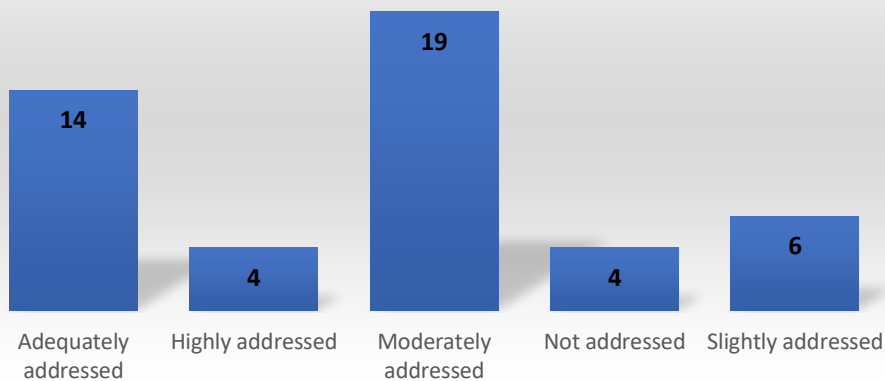
Respondents assign a mediocre deal of significance to these competences by addressing them moderately during their courses, thus giving the impression that Sustainability-related skills are not as crucial as might be expected. This is also enhanced by the high ratings that were attributed to the responses ‘Slightly addressed’ and ‘Adequately addressed’ in all skills, too.



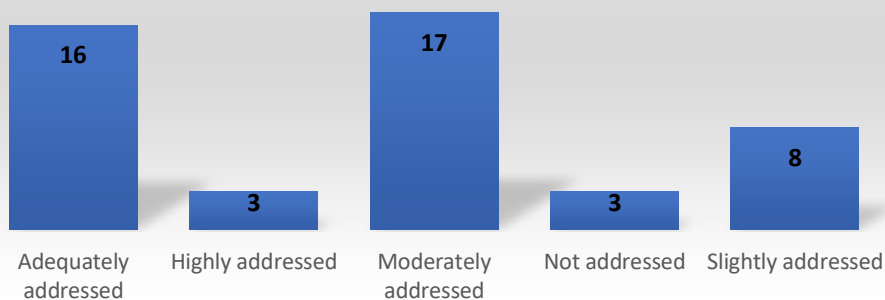
Know and be able to apply the environmental rules and certification criteria in the food service industry



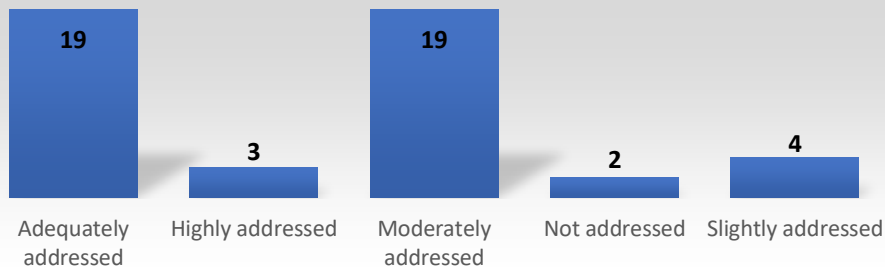
Know which ingredients have the highest environmental impact



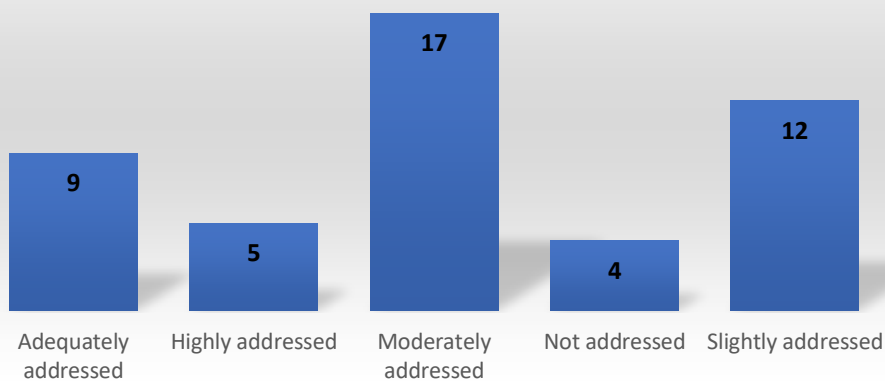
Identify and implement practices coherent with a sustainable management of waste



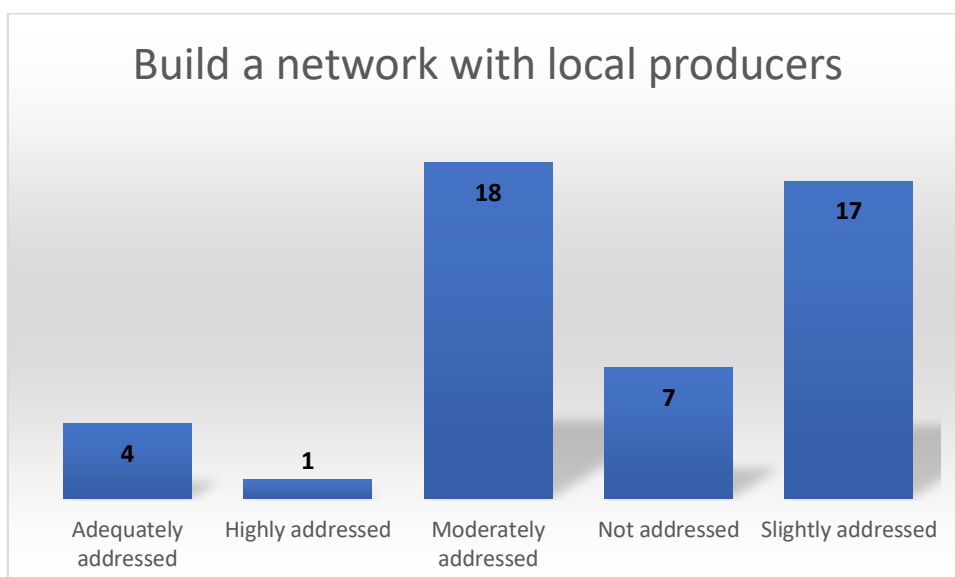
Be able to develop a menu focused on seasonal ingredients, produced locally, using smaller amounts of animal products in dishes and expanding...



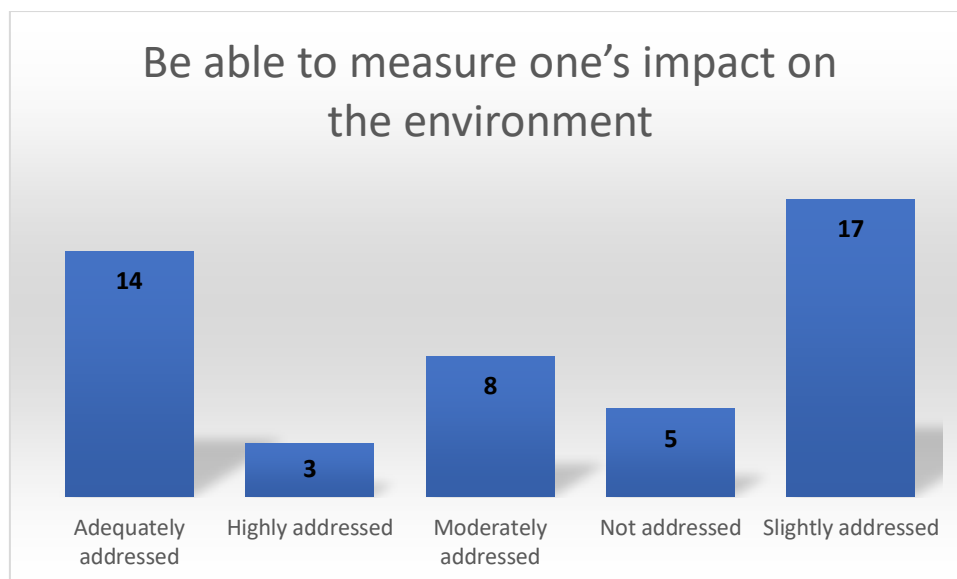
Select sustainable production systems for all food and consumables



Another category of skills associated with sustainability is **Communication and Network** competences. These competences were assessed in the questionnaire through 'Communicate sustainable goals to staff and customers' and 'Establish connections with local producers'. As it can be seen in the charts below, most VET teachers replied that they address these skills either slightly or moderately, while it is observed that in this section the response 'Not addressed' compiles higher numbers in total compared to other rated skills.

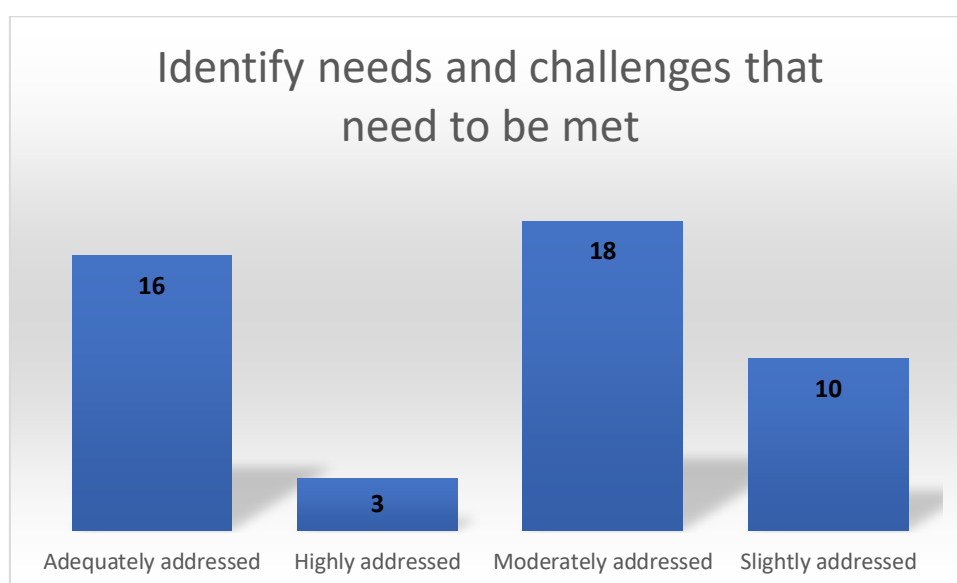


In the last competence **Measure of Impact**, concerning one's environmental impact, which includes factors such as water and energy usage, waste production, and greenhouse gas emissions, among others. The higher ratings in this competence were on the 'Slightly addressed' and 'Adequately addressed', implying that there is not a specific perception on the necessity of this competence.

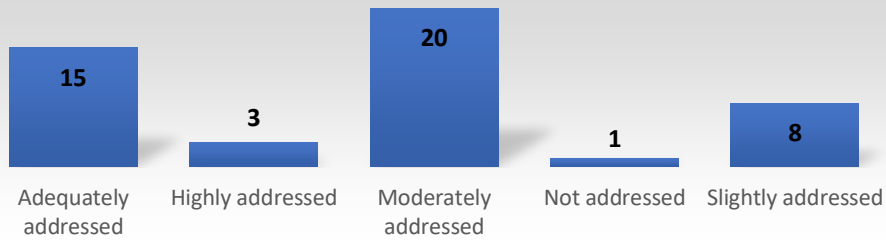


The second section of the survey aimed to evaluate the level on which VET teachers address and develop entrepreneurship skills to their students within their courses. The questionnaire categorized these competences related to entrepreneurship into the pillars of **Ideas & Opportunities**, **Resources**, and **Into Action**, as outlined in EntreComp.

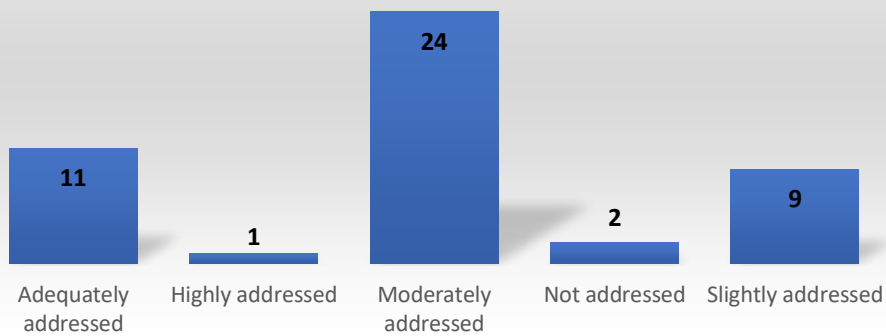
Starting with the Ideas & Opportunities category, first it should be mentioned that there are not high ratings in the option 'Not addressed at all' meaning that VET teachers recognize the necessity of these competences on a higher or lesser degree. Out of 47 respondents, around 30 of them and more replied that they address all the competences adequately and moderately, apart from 'Reflect on how sustainable long-term social, cultural and economic goals are, and the course of action chosen' which is adequately and moderately addressed only by 24 VET teachers. Also, this is the competence that gathered the most 'Slightly addressed' responses, while the 'Act responsibly' skill is the most highly addressed of all.



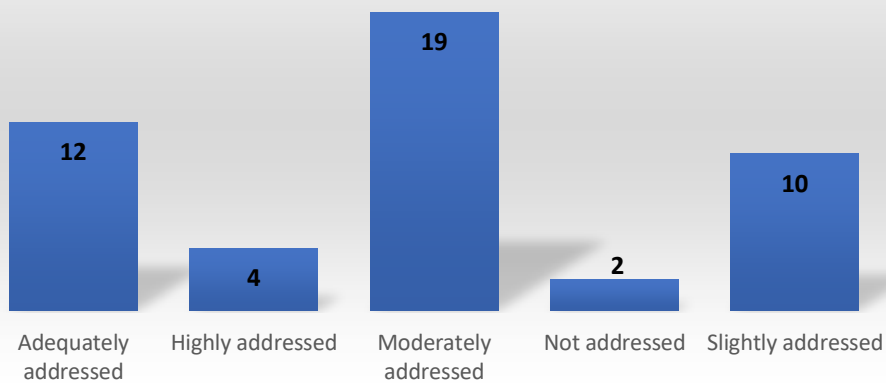
Develop several ideas and opportunities to create value including better solutions to existing and new challenges



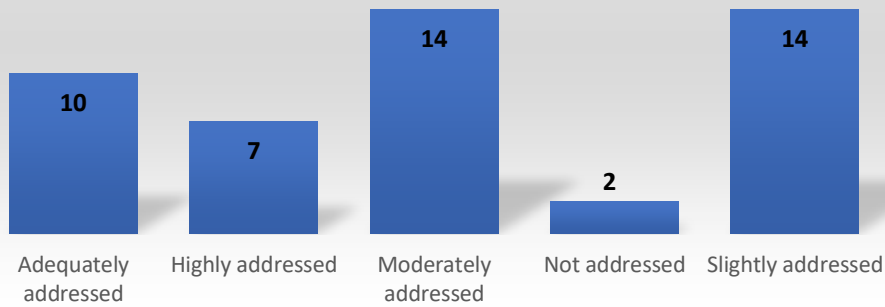
Explore and experiment with innovative approaches



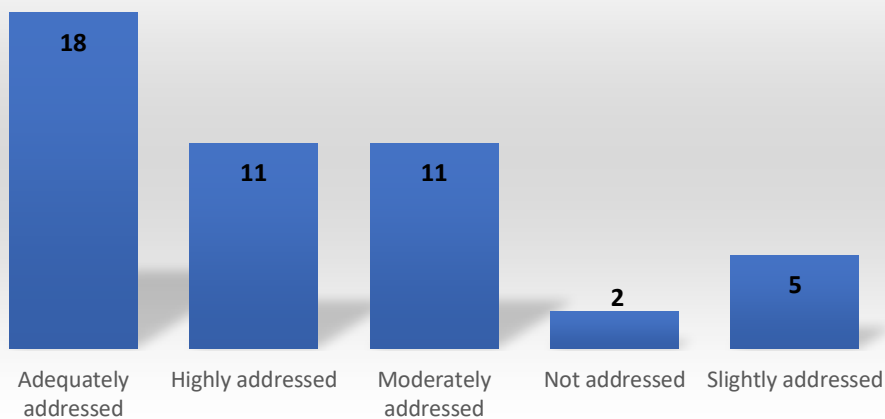
Visualise future scenarios to help guide effort and action



Reflect on how sustainable long-term social, cultural and economic goals are, and the course of action chosen

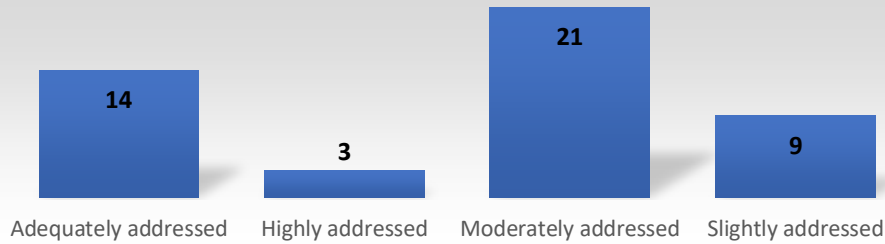


Act responsibly

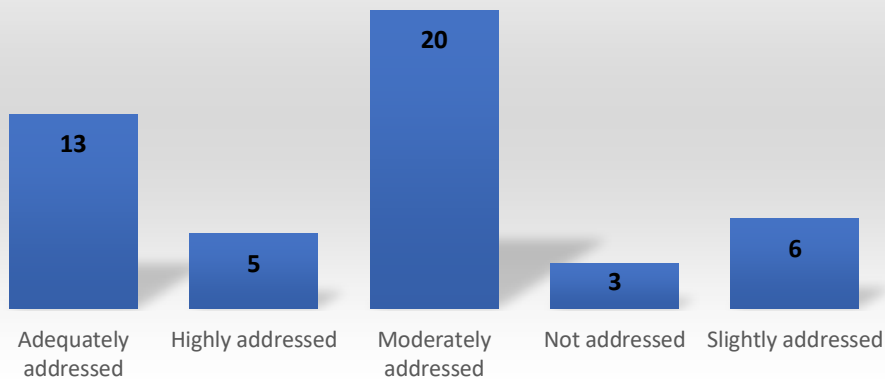


Moving on to the Resources category of entrepreneurial competences, there was a noticeable allocation of responses among 'Slightly addressed', 'Moderately addressed', and 'Adequately addressed', with these options compiling higher numbers. More specifically, the competences 'Identify and assess individual and group strengths and weaknesses, being determined to satisfy the need to achieve', 'Make the most of limited resources', and 'Get and manage the competences needed at any stage, including technical, legal, tax and digital competences' had the most "Moderately addressed' responses, while it is important to notice that not a high percentage of VET teachers highly address any of these competences.

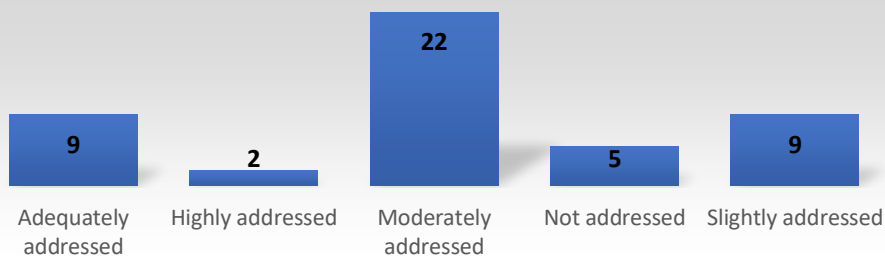
Identify and assess individual and group strengths and weaknesses, being determined to satisfy the need to achieve



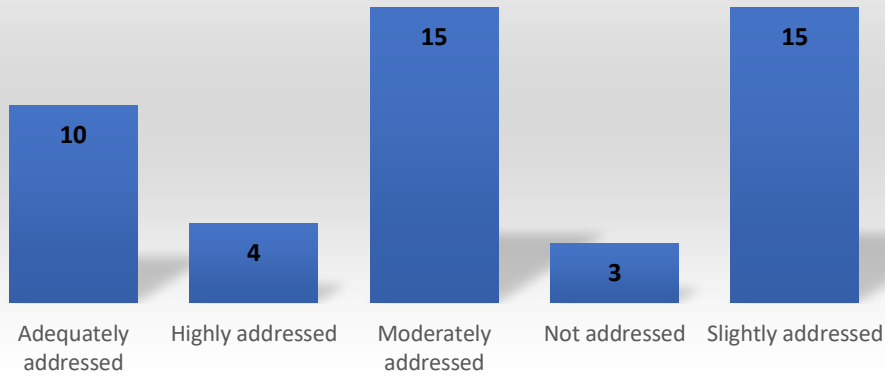
Make the most of limited resources



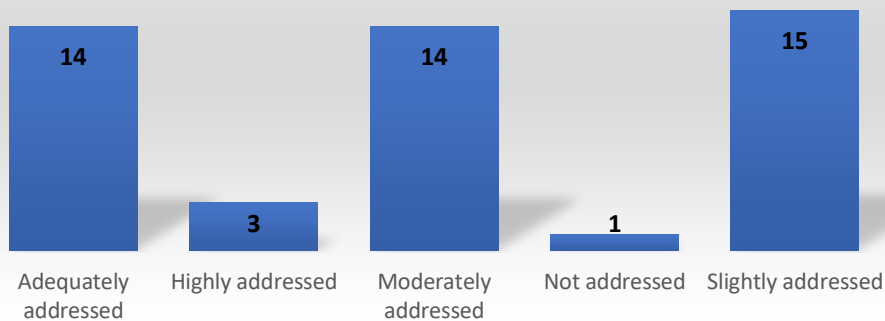
Get and manage the competences needed at any stage, including technical, legal, tax and digital competences



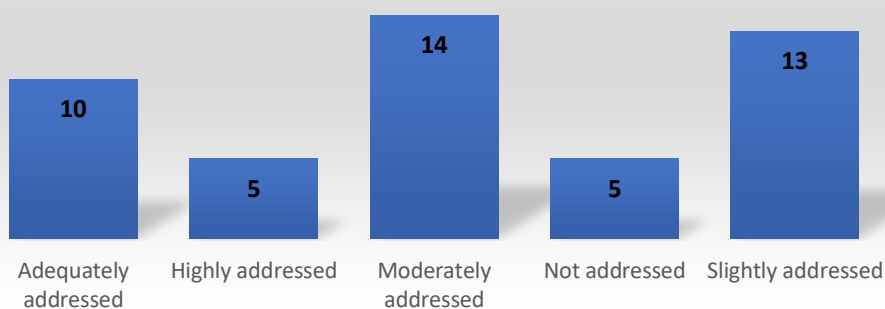
Get the support needed to achieve valuable outcomes



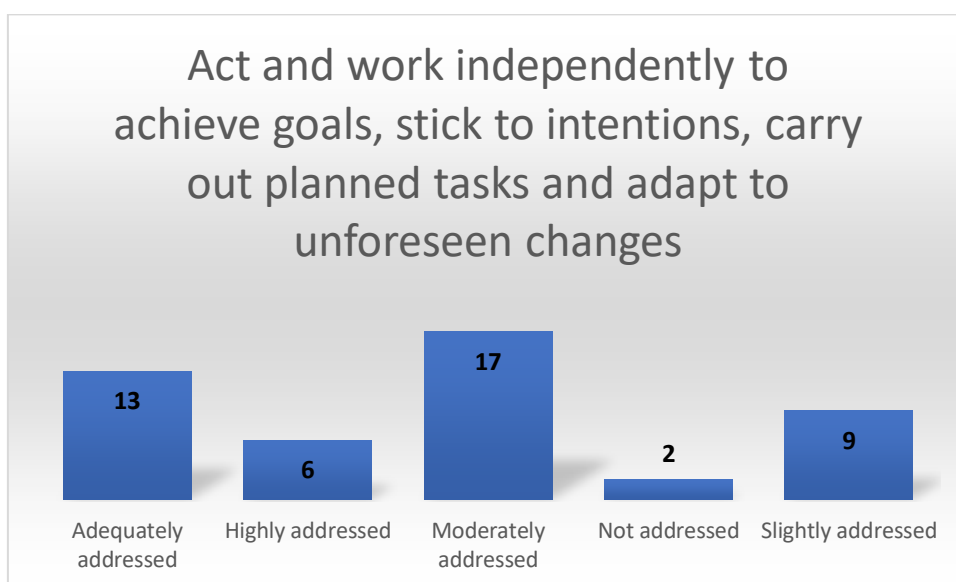
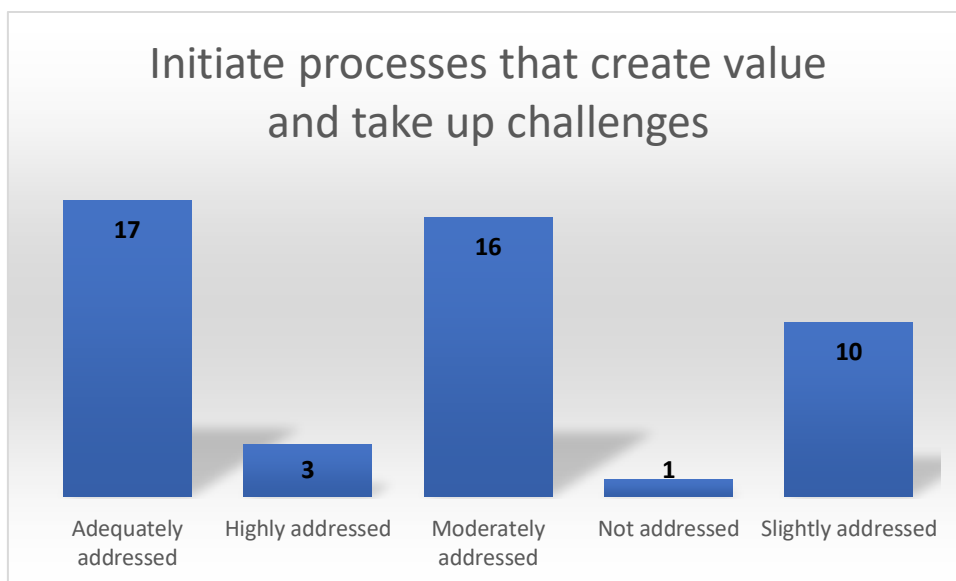
Demonstrate effective communication, persuasion, negotiation, and leadership



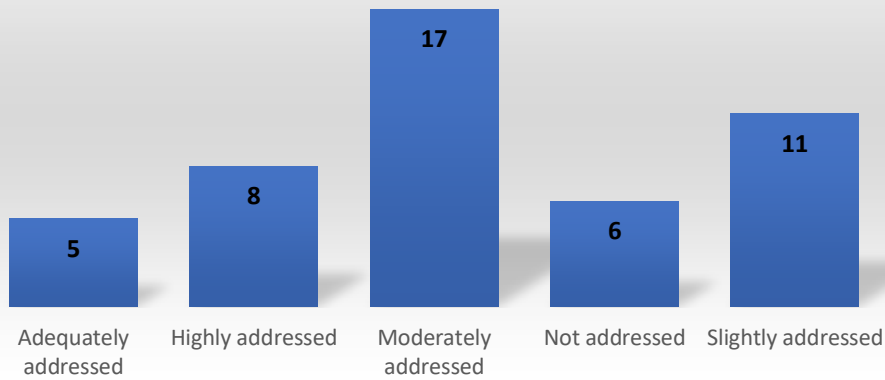
Interact, communicate and share information/content through digital technologies



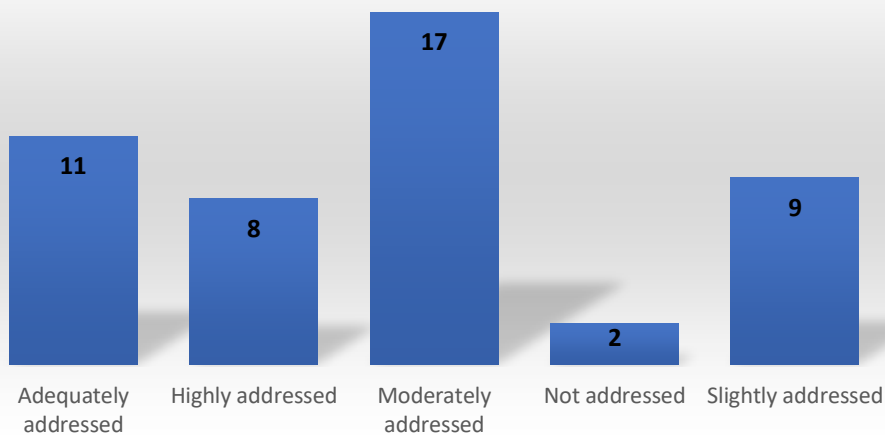
A similar scenario appears in the Into Action category, where most competences were characterized mostly as ‘Slightly addressed’, ‘Moderately addressed’, and ‘Adequately addressed’, as depicted in the accompanying charts. Only in the competences ‘Work together and co-operate with others to develop ideas and turn them into action’ and ‘Learn with others, including peers and mentors, and learn from both success and failure’ had more than 10 ‘Highly addressed’ responses, and in the competences ‘Define priorities and action plans’ and ‘Learn with others, including peers and mentors, and learn from both success and failure’, the ‘Highly addressed’ responses were close to the ‘Adequately addressed’ responses. Again the ‘Moderately addressed’ and ‘Slightly addressed’ responses were the “protagonists” in this survey among VET teachers.



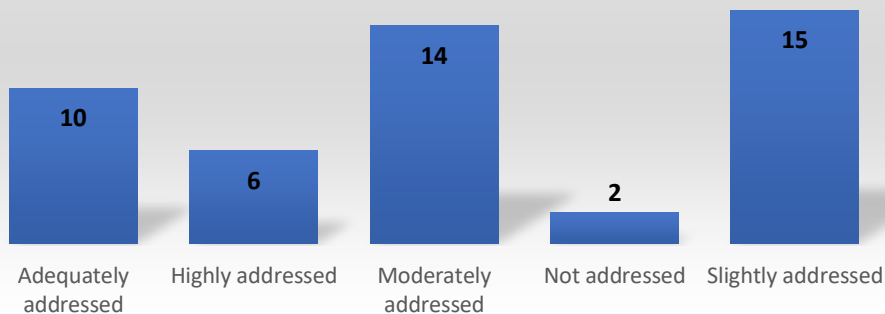
Set long-, medium- and short-term goals



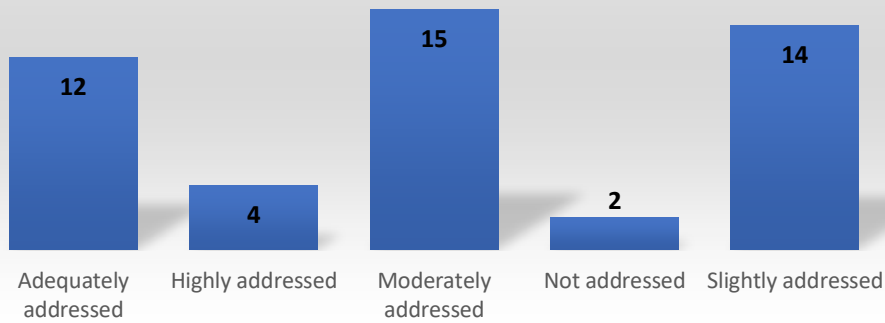
Define priorities and action plans



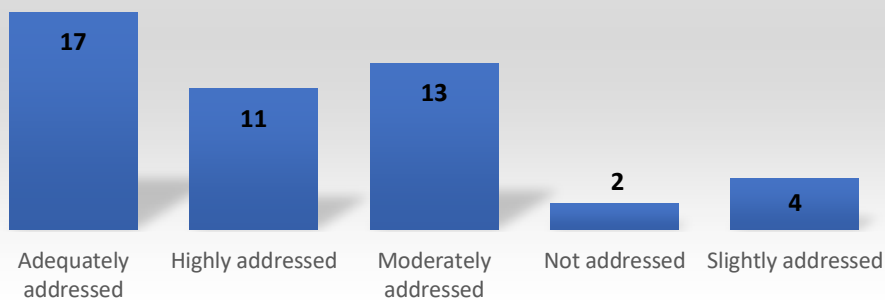
Make decisions when the result of that decision is uncertain, when the information available is partial or ambiguous, or when there is a risk of unintended outcomes



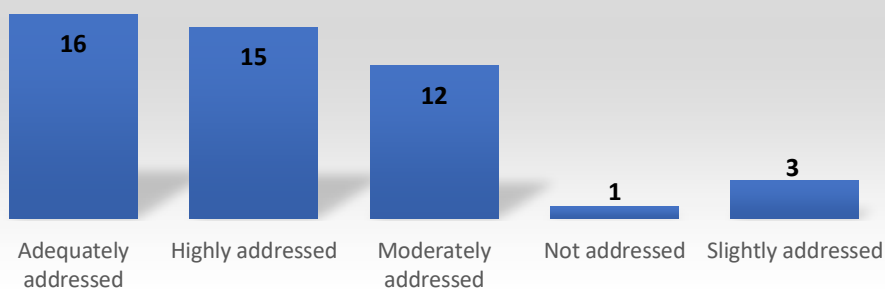
Handle fast-moving situations promptly and flexibly to solve conflicts and face up to competition



Work together and co-operate with others to develop ideas and turn them into action



Learn with others, including peers and mentors, and learn from both success and failure



The results of the survey indicate that sustainability-related skills are not prioritized by educators in vocational education and training (VET) courses. Respondents attributed a moderate level of importance to sustainability competencies, with the most frequent responses being "Slightly addressed" and "Adequately addressed." Similarly, communication and networking skills pertaining to sustainability received comparable ratings. The survey also assessed the extent to which VET teachers address entrepreneurship skills, which were classified into three categories: Ideas & Opportunities, Resources, and Into Action. The findings revealed that most competencies within these categories were predominantly classified as "Slightly addressed," "Moderately addressed," and "Adequately addressed." Hence, the survey reveals that VET teachers acknowledge the significance of incorporating these competencies to some extent, but they are not accorded high priority in their VET courses.

Activity 3 Comparison of findings

Description and debriefing of the skills gap based on the comparative analysis

A skill gap refers to the mismatch between the skills and knowledge that employers require for a job and the skills and knowledge that the job seekers or employees possess. It refers to the difference between the skills that employers need in their workforce and the skills that job seekers possess. The skill gap can exist at different levels, ranging from individual employees to entire industries or regions.

Skill gaps are created due to a variety of factors. Some of the most common reasons include:

- Technological advancements
- Change of industry trends
- Education and training
- Demographic changes

Overall, skill gaps can have significant implications for businesses and individuals, including decreased productivity, decreased competitiveness, and higher unemployment rates. It is important for employers, educators, and policymakers to work together to identify skill gaps and develop strategies for closing them.

In summary, the data from the survey results mentioned above will be compared to draw conclusions on the skills gap(s) created by the skills required in the labor market, which, in this research, is represented by the survey responses from the food/catering sector industries and the European frameworks that define the required entrepreneurial, green, digital skills for young employees in the 21st century, and by the skills offered and worked through VET education, which, in this research, is represented by the VET curriculums and the survey responses from the teachers in the VET schools.

Based on the given data, it can be inferred that there is a significant skills gap between the required skills in the food/catering industry related to sustainability and the European frameworks, VET curriculums, and VET teachers. The survey conducted among food and catering industries showed that sustainability practices are required in most of the enterprises surveyed. Enterprises need employees who are aware of the environmental impact of food and who can develop and implement sustainable practices in the workplace. They also need employees who can communicate and network effectively, build relationships with local producers, and measure their impact on the environment. Additionally, entrepreneurial competencies such as identifying needs and challenges, developing ideas and

opportunities, and taking action to achieve goals are important for success in the food and catering sector.

In terms of sustainability, the food/catering industries require skills related to several aspects of how sustainable practices are applied in a food/catering business. However, the VET curriculums and VET teachers seem to lack the ability to teach these skills effectively, with low ratings in some of the skills rated in the survey.

This skills gap can have significant consequences for the food/catering industry's ability to address sustainability issues effectively. To bridge this gap, it is essential to develop VET curriculums and provide training for VET teachers that emphasize sustainability skills required by the industry. Additionally, European frameworks should incorporate these skills in their guidelines to better prepare individuals for sustainable practices in the food/catering industry.

Overall, these findings suggest that there is a need for more emphasis on practical application and implementation of sustainability practices in VET curriculums, as well as more training and support for VET teachers to effectively teach sustainability topics. Additionally, there may be a need for increased awareness and demand for sustainability skills in the labor market to ensure that VET graduates are equipped with the skills necessary to meet industry demands.

While technical skills are crucial for operating utensils and machinery and knowledge of recipes, entrepreneurial and managerial skills are necessary for successful operation of a restaurant business. VET schools can play a crucial role in addressing this gap by providing both technical and entrepreneurial and managerial skills. Regarding entrepreneurial, digital, green skills, first, it is noticeable that there is a relatively high level of consistency between the skills required by the Food/catering industries and those described by the European frameworks. Across all skills categories, the industry and frameworks both assign the highest score to a majority of the skills listed. This suggests that the industry and the European frameworks agree on what skills are necessary for success in the field.

The findings from the survey on sustainability-related skills and entrepreneurship skills in vocational education and training (VET) courses shed light on the skills gap that exists in the food and catering sector. According to the survey results, sustainability-related skills are not prioritized by educators in VET courses. Respondents attributed a moderate level of importance to sustainability competences. Thus, the curriculum of VET schools should focus on developing both technical and managerial and entrepreneurial skills to address the skills gap between the desired and targeted competences for the food and catering sector by employers and frameworks, and the competences that are deployed in VET education. By providing the necessary technical and managerial and entrepreneurial skills, VET schools can help prepare young learners for successful careers in the food and catering sector.

There is a significant gap between the skills required by the industry and those taught in VET curriculums, as well as those addressed by VET teachers. In many cases, the VET curriculums and teachers score significantly lower on specific skills than both the industry and the European frameworks. This gap suggests that there is room for improvement in VET curriculums and in the training of VET teachers to better align with the needs of the industry. This may require changes in the way that VET programs are designed and delivered, as well as the development of new training resources to help teachers better prepare students for the workforce.

Activity 4 Matrix development

Methodology and how to use a matrix

A matrix table with numerical data is a type of table or grid where each row and column represent a variable or category, and the cells in the table contain numerical data that represents the relationship between those variables or categories. Matrix tables with numerical data are commonly used in data analysis and statistics to organize and display large amounts of data in a clear and concise manner, making it easier to identify patterns, trends, and relationships between variables.

Interpreting results in a matrix table involves analyzing the data to identify patterns, trends, and insights. Here are some general steps you can follow to interpret results in a matrix table:

- Examine the labels for each row and column to understand the categories being represented in the table.
- Look for any outliers or anomalies in the data, such as unusually high or low values, missing data, or unexpected patterns.
- Examine the shading or formatting of the cells to identify any patterns or trends in the data. For example, cells with a darker shading may indicate higher values than cells with lighter shading.
- Look for relationships between the data in different rows and columns. For example, if the table represents sales data, you may look for products that are consistently selling well across different regions.
- Use additional tools and techniques, such as charts and graphs, to further visualize and analyze the data.

When interpreting results in a matrix table, it's important to keep in mind the context and purpose of the data. The insights and conclusions you draw from the data will depend on the specific application and the questions you are trying to answer. Overall, interpreting results in a matrix table involves analyzing the data, identifying patterns and trends, and drawing insights and conclusions that can inform decision-making and drive improvements.

Defining the data to insert in a matrix table for competences and fields of interest requires identifying the different competences and fields of interest that you want to display in the table, and then determining how to quantify and categorize these variables. Here are some steps you can follow:

1. Identify the **competences** that you want to display in the table. For example, in our case the competences identified and included in the survey questionnaires for food/catering sector industries and VET teachers will constitute the data to be inserted and measured in the columns of the matrix table.
2. Identify the **fields of interest** that you want to display in the table. In our case the general fields of interest are divided between required and addressed competences. The former field consists of the food/catering sector industries of partner countries, VET teachers' expertise and personal assessment of what is considered as required competences through courses, and

the European competence frameworks, EntreComp, GreenComp, DigComp. The competences addressed in VET education include the competences that are addressed in the VET schools' curriculums and by the VET teachers from the VET schools in partner countries.

3. Determine how to **quantify** and categorize the competences and fields of interest. For competences assessed in the surveys, the rates 1-5 are used to depict their presence and importance in the fields of interest where the skills mapping was conducted through questionnaires with a likert scale. Based on the average rating that the competences had in every survey, the relevant number was filled in the box regarding the competence and the field of interest it was assessed. For example, the competences that had an average rating of 3-3,4 in the surveys take the value 3. The indication N/A is used for the fields that the competences were not identified or addressed due to lack of involvement of the partner country in this activity.
4. For the VET curriculums, the value 1 means "present in the curriculums", and 5 is "absent from the curriculum"; accordingly, for the field of VET teachers, it means that 1 would be "strongly addressed during the course" and 5 would be "strongly omitted during the course". In this way, a simple addition of all the numbers shows which skills are lacking: a high sum for the required competences would mean that it is a highly important skill, and a high sum in the not addressed competences would mean that the skill is neglected in the learning process; therefore, a high total score of "[required competences] + [not addressed competences]" depicts that it is an important skill lacking in the training courses.
5. A matrix table was created using the spreadsheet software Excel. The rows of the table represent the competences under discussion, and the columns represent the above-mentioned fields of interest.
6. The data for each cell of the table were entered based on the quantification and categorization method determined in steps 3 and 4.
7. The table was designed and formatted in a way to make it more readable and easier to interpret, such as by adding borders, shading, or font styles.
8. Three (3) versions of the matrix were created: Version 1 takes into account all the field of interest for the competences, Version 2 "ignores" the competences rating in the European Frameworks field, and Version 3 "ignores" the competences rating both in the European frameworks and VET curriculums to only compare competences directly from the VET teachers' experience and the industries. Through the comparison of these versions, it becomes obvious which competences appear as most "wanted" and "lacked" in the fields of interest repetitively. These are the competences that form the skills gap to be bridged and need to be addressed on a high degree.

		SSPICE IT - Skills Matrix																																		
		REQUIRED COMPETENCES															ADDRESSED COMPETENCES										Comparison									
Field of research		Food/catering Industries					VET teachers					European frameworks					VET curriculums					VET teachers					Required competences	Assessed competences	Full Comparison							
Competences		Italy	Greece	Portugal	Belgium	Spain	Romania	AVERAGE	Italy	Greece	Portugal	Belgium	Spain	Romania	AVERAGE	EntreComp	GreenComp	DigiComp	AVERAGE	Italy	Greece	Portugal	Belgium	Spain	Romania	AVERAGE	Italy	Greece	Portugal	Belgium	Spain	Romania	AVERAGE	Required competences	Assessed competences	Full Comparison
SUSTAINABILITY	1. Recognize the principal relations and problems between humans and environment	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.8	3.8	2.8	1.3
	2. Understand the environmental impact of food	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.8	4.1	3.4	1.2
	3. Understand the correlation between health and sustainable food	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.8	4.7	2.9	1.6
	4. Adopt sustainable practices in one's job	5	5	4	4	4	4.5	5	5	5	N/A	5	5	5.0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.8	4.8	2.8	1.8
	5. Know and be able to apply the environmental rules and certification criteria	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.2	3.2	1.1	1.1
	6. Know which ingredients have the highest environmental impact	4	4	4	4	4	4.2	5	4	5	N/A	5	5	5.0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.8	3.8	2.8	1.3
	7. Identify and implement practices coherent with sustainable waste management	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.7	2.2	2.1	2.1
	8. Develop a menu focused on seasonal ingredients, produced locally, using smaller amounts of animal products in dishes and expanding plant-based dishes	5	5	4	4	4	4.5	5	5	5	N/A	5	5	5.0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.7	2.2	2.1	2.1
	9. Select sustainable production systems for all food and consumables	4	4	4	4	4	4.2	5	4	5	N/A	5	5	5.0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.3	4.3	2.3	1.8
	10. Communicate sustainable ambitions to staff and consumers	4	4	4	3	4	4.3	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.6	2.1	2.2	2.1
	11. Build a network with local producers	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.7	2.6	1.8	1.8
	12. Be able to measure one's impact on the environment	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.0	1.4	1.4	2.8
	13. Identify needs and challenges that need to be met	4	4	4	3	4	4.3	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.7	3.1	1.6	1.6
	14. Develop several ideas and opportunities to create value	4	4	4	3	4	4.3	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.1	3.0	1.4	3.0
	15. Explore and experiment with innovative approaches	4	4	4	3	4	4.3	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.1	2.1	1.9	1.9
	16. Visualise future scenarios to help guide effort and action	4	4	4	3	4	4.3	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.1	2.9	1.4	2.9
	17. Reflect on how sustainable long-term social, cultural and economic goals and actions are	4	4	4	3	4	4.3	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.1	2.9	1.4	2.9
	18. Act responsibly	5	4	4	4	4	4.3	5	4	5	N/A	5	5	5.0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.8	3.7	1.3	1.3
	19. Identify and assess individual and group strengths and weaknesses	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.2	3.6	2.2	1.6
	20. Make the most of limited resources	5	4	4	4	4	4.3	5	4	5	N/A	5	5	5.0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.7	3.6	1.0	1.0
	21. Get and manage the competences needed at any stage, including technical, legal, tax and digital competences	4	4	4	3	4	3.7	5	4	5	N/A	5	5	5.0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.0	4.0	1.9	1.9
	22. Get the support needed to achieve valuable outcomes	4	4	4	3	4	4.3	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.1	2.1	1.9	1.9
	23. Demonstrate effective communication, persuasion, negotiation, and leadership	4	4	4	3	4	4.3	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.8	3.4	1.1	1.1
	24. Interact, communicate and share information/content through digital technologies	4	4	4	3	4	4.3	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.8	3.4	1.1	1.1
	25. Initiate processes that create value and take up challenges	4	4	4	4	4	4.2	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.1	3.5	2.8	1.3
	26. Act and work independently to achieve goals, stick to intentions, carry out planned tasks and adapt to unforeseen changes	4	4	4	4	4	4.2	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.2	3.6	1.2	1.2
	27. Set long-, medium- and short-term goals	4	4	4	4	4	4.2	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.6	2.2	1.6	1.6
	28. Define priorities and action plans	4	4	4	4	4	4.2	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.5	3.8	2.4	1.5
	29. Make decisions when the result of that decision is uncertain, partial or ambiguous, with risk of unintended outcomes	4	4	4	3	4	4.3	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.1	1.6	2.8	1.6
	30. Handle fast-moving situations promptly and flexibly to solve conflicts and face up to competition	4	4	4	3	4	4.3	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.2	2.2	1.9	1.9
	31. Co-operate with others to develop ideas and turn them into action	5	4	4	4	4	4.3	5	4	5	N/A	5	5	5.0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.8	3.2	1.5	1.5
	32. Learn with others, peers and mentors, from both success and failure	5	4	4	4	4	4.3	5	4	5	N/A	5	5	5.0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.2	2.6	1.8	1.8

Figure 22. Matrix of competences_v1

		SSPICE IT - Skills Matrix																																		
		REQUIRED COMPETENCES															ADDRESSED COMPETENCES										Comparison									
Field of research		Food/catering Industries					VET teachers					European frameworks					VET curriculums					VET teachers					Required competences	Assessed competences	Full Comparison							
Competences		Italy	Greece	Portugal	Belgium	Spain	Romania	AVERAGE	Italy	Greece	Portugal	Belgium	Spain	Romania	AVERAGE	EntreComp	GreenComp	DigiComp	AVERAGE	Italy	Greece	Portugal	Belgium	Spain	Romania	AVERAGE	Italy	Greece	Portugal	Belgium	Spain	Romania	AVERAGE	Required competences	Assessed competences	Full Comparison
SUSTAINABILITY	1. Recognize the principal relations and problems between humans and environment	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.8	4.5	2.8	1.6
	2. Understand the environmental impact of food	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.5	3.4	1.3	1.3
	3. Understand the correlation between health and sustainable food	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.2	4.5	2.9	1.6
	4. Adopt sustainable practices in one's job	5	5	4	4	4	4.5	5	5	5	N/A	5	5	5.0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.8	2.8	1.7	1.7
	5. Know and be able to apply the environmental rules and certification criteria	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.8	3.2	1.4	1.4
	6. Know which ingredients have the highest environmental impact	4	4	4	4	4	4.2	5	4	5	N/A	5	5	5.0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	3.8	4.5	3.2	1.4
	7. Identify and implement practices coherent with sustainable waste management	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.8	2.8	1.7	1.7
	8. Develop a menu focused on seasonal ingredients, produced locally, using smaller amounts of animal products in dishes and expanding plant-based dishes	5	5	4	4	4	4.5	5	5	5	N/A	5	5	5.0	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.7	2.2	2.0	2.0
	9. Select sustainable production systems for all food and consumables	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.3	4.6	2.2	2.1
	10. Communicate sustainable ambitions to staff and consumers	4	4	4	3	4	4.3	4	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.6	2.1	2.1	2.1
	11. Build a network with local producers	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.7	2.6	1.8	1.8
	12. Be able to measure one's impact on the environment	4	4	4	4	4	4.2	5	4	5	N/A	5	5	4.8	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	4.0			

Conclusions and remarks

More precisely and always based on the created versions of the matrix above, the competences, either in the sustainability aspect or in the entrepreneurial, digital, green spectrum, that were emerged as most critical to address for the needs of future employees in the food and catering sector were highlighted in every version depending on the score as measured in the methodology described. Furthermore, they were compared to indicate the repetition of some of them and in this way reach conclusions about which are the required competences in the prevailing situation of the sector. Below, only the lists with the competences are provided:

Recognize the principal relations and problems between humans and environment
Understand the environmental impact of food
Understand the correlation between health and sustainable food
Adopt sustainable practices in one's job
Know and be able to apply the environmental rules and certification criteria
Know which ingredients have the highest environmental impact
Identify and implement practices coherent with sustainable waste management
Develop a menu focused on seasonal ingredients, produced locally, using smaller amounts of animal products in dishes and expanding plant-based dishes
Select sustainable production systems for all food and consumables
Communicate sustainable ambitions to staff and consumers
Build a network with local producers
Be able to measure one's impact on the environment
Identify needs and challenges that need to be met
Develop several ideas and opportunities to create value
Explore and experiment with innovative approaches
Visualise future scenarios to help guide effort and action
Reflect on how sustainable long-term social, cultural and economic goals and actions are
Act responsibly
Identify and assess individual and group strengths and weaknesses
Make the most of limited resources
Get and manage the competences needed at any stage, including technical, legal, tax and digital competences

Get the support needed to achieve valuable outcomes
Demonstrate effective communication, persuasion, negotiation, and leadership
Interact, communicate and share information/content through digital technologies
Initiate processes that create value and take up challenges
Act and work independently to achieve goals, stick to intentions, carry out planned tasks and adapt to unforeseen changes
Set long-, medium- and short-term goals
Define priorities and action plans
Make decisions when the result of that decision is uncertain, partial or ambiguous, with risk of unintended outcomes
Handle fast-moving situations promptly and flexibly to solve conflicts and face up to competition
Co-operate with others to develop ideas and turn them into action
Learn with others, peers and mentors, from both success and failure

Recognize the principal relations and problems between humans and environment
Understand the environmental impact of food
Understand the correlation between health and sustainable food
Adopt sustainable practices in one's job
Know and be able to apply the environmental rules and certification criteria
Know which ingredients have the highest environmental impact
Identify and implement practices coherent with sustainable waste management
Develop a menu focused on seasonal ingredients, produced locally, using smaller amounts of animal products in dishes and expanding plant-based dishes
Select sustainable production systems for all food and consumables
Communicate sustainable ambitions to staff and consumers
Build a network with local producers
Be able to measure one's impact on the environment
Identify needs and challenges that need to be met
Develop several ideas and opportunities to create value

Explore and experiment with innovative approaches
Visualise future scenarios to help guide effort and action
Reflect on how sustainable long-term social, cultural and economic goals and actions are
Act responsibly
Identify and assess individual and group strengths and weaknesses
Make the most of limited resources
Get and manage the competences needed at any stage, including technical, legal, tax and digital competences
Get the support needed to achieve valuable outcomes
Demonstrate effective communication, persuasion, negotiation, and leadership
Interact, communicate and share information/content through digital technologies
Initiate processes that create value and take up challenges
Act and work independently to achieve goals, stick to intentions, carry out planned tasks and adapt to unforeseen changes
Set long-, medium- and short-term goals
Define priorities and action plans
Make decisions when the result of that decision is uncertain, partial or ambiguous, with risk of unintended outcomes
Handle fast-moving situations promptly and flexibly to solve conflicts and face up to competition
Co-operate with others to develop ideas and turn them into action
Learn with others, peers and mentors, from both success and failure

Recognize the principal relations and problems between humans and environment
Understand the environmental impact of food
Understand the correlation between health and sustainable food
Adopt sustainable practices in one's job
Know and be able to apply the environmental rules and certification criteria
Know which ingredients have the highest environmental impact
Identify and implement practices coherent with sustainable waste management



Develop a menu focused on seasonal ingredients, produced locally, using smaller amounts of animal products in dishes and expanding plant-based dishes
Select sustainable production systems for all food and consumables
Communicate sustainable ambitions to staff and consumers
Build a network with local producers
Be able to measure one's impact on the environment
Identify needs and challenges that need to be met
Develop several ideas and opportunities to create value
Explore and experiment with innovative approaches
Visualise future scenarios to help guide effort and action
Reflect on how sustainable long-term social, cultural and economic goals and actions are
Act responsibly
Identify and assess individual and group strengths and weaknesses
Make the most of limited resources
Get and manage the competences needed at any stage, including technical, legal, tax and digital competences
Get the support needed to achieve valuable outcomes
Demonstrate effective communication, persuasion, negotiation, and leadership
Interact, communicate and share information/content through digital technologies
Initiate processes that create value and take up challenges
Act and work independently to achieve goals, stick to intentions, carry out planned tasks and adapt to unforeseen changes
Set long-, medium- and short-term goals
Define priorities and action plans
Make decisions when the result of that decision is uncertain, partial or ambiguous, with risk of unintended outcomes
Handle fast-moving situations promptly and flexibly to solve conflicts and face up to competition
Co-operate with others to develop ideas and turn them into action
Learn with others, peers and mentors, from both success and failure

In conclusion, the food and catering sector requires a combination of green, digital, and entrepreneurial skills. VET schools can play a crucial role in addressing the skills gap by providing necessary technical and managerial and entrepreneurial skills. The skills mapping in all the above mentioned environments suggests that sustainability, communication/networking, and entrepreneurship skills are crucial for success in the sector. Therefore, there is a need for VET schools to focus more on entrepreneurship and managerial skills to bridge the skills gap in the sector.

Apart from the data analysis conducted above, in this section the additional comments of each target group in the surveys are compiled to indicate what extra elements can be taken into consideration to bridge the skills gap between the required and addressed competences in the food/catering sector.

Survey in food/ catering industries

The comments provided by the representatives of the food/catering industries that participated in the survey as additional input for what is expected in terms of green, digital, and entrepreneurial skills are concentrated in the following main categories:

- Desire to learn
- Efficiency and awareness of energy and water consumption
- Good knowledge and practice of hygiene rules
- Minimization of food waste
- Use and exploitation of regional and seasonal products
- Innovation and creativity
- Social media skills (especially on Instagram and Facebook)
- Ambition and resilience
- Communication with local public bodies for support assurance
- Speaking foreign languages and learning basic calculation skills
- Non-violent communication skills
- Maximizing permanent education initiatives for disadvantaged people
- Ecofriendly competences
- Sophistication in the presentation of products and dishes
- Local network improvement

One of the most important skills is the desire to learn, as the food industry is constantly evolving and it is crucial for employees to stay up to date with the latest developments. Learning about regional and seasonal products and having sophistication in the presentation of dishes are also important skills.

In addition, it is important for employees to be aware of the actions that impact climate change and be resilient in the face of challenges such as fluctuating prices from local producers. Adherence to hygiene rules is also a critical skill in this industry, and it is important to have a good knowledge of these rules and the ability to implement them.

Digitization is increasingly present in our daily lives, and it is important for food/catering industries to have the knowledge to use social media platforms for promotion purposes. Another essential skill is the ability to minimize food waste in the preparation process, therefore employees should also be aware of energy and water consumption in the workplace and strive for efficiency in this regard. Employees should have the responsibility to learn, take initiatives and show creativity. Overall, eco-

friendly competences, the desire to learn, innovation, and good knowledge of hygiene rules are essential skills for new employees in the food and catering sector.

Survey in VET teachers

Apart from asking VET teachers to identify which competences they address during VET courses, another aspect of the questionnaire required from teachers to respond which competences they think SHOULD BE ADDRESSED in VET education for students that are about to become the future workers in the food/catering sector. As can be seen in the matrix, there was consensus by all VET teachers who rated all the competences as Important and Very important to be addressed in courses.

Moreover, the teachers from VET schools who took part in the survey were invited to provide their additional comments on other competences that they would define as required skills in the catering/restaurant sector, with particular reference to sustainability, digitalization, and soft skills. What was indicated by VET teachers is listed below:

- Enhancement of skills to improve practical level of awareness about agri-food products, production, environmental impact, and sustainability
- Basic knowledge of primary production systems with special reference to food industry and small-scale production with effects on local economy
- Soft skills, including communication, active listening, conflict resolution, trust, and organization, should be emphasized at cultural and practical levels
- Development of basic scientific knowledge and skills, especially for identifying major environmental issues and designing solutions in educational and professional contexts
- Formation of work groups to better understand goals related to food sustainability and awareness
- Skills for implementation of sustainable cultivation and breeding processes, with emphasis on innovative sustainable techniques with a focus on water conservation
- Curriculum should be reviewed and updated to reflect current themes and problems in world economy, including sustainability and digital skills
- Ecological awareness and knowledge about ecological foods and ingredients, local and organic production, reduction of waste, and good social media use
- Knowledge of hygiene rules, food sector good practices, waste management rules, HACCP principles, hygiene rules and good manufacturing practices, non-conformity management, risk-based thinking, and PDCA principles
- Digital skills, such as Excel use, social media good practices, GDPR provisions and requirements, and risk evaluation and assessment

Annex

Annex 1

SECTION 1. INFORMATION ABOUT THE COMPANY

Country where the company resides	
Name of the company / SME	
Number of employees	
Role of the respondent to the questionnaire	
E-mail of the respondent	
Approach to sustainability: Has the company already introduced any sustainability practices? <input type="checkbox"/> Yes <input type="checkbox"/> No If yes, in what sector/field? <input type="checkbox"/> Short supply chain <input type="checkbox"/> Menu with seasonal products <input type="checkbox"/> Waste management <input type="checkbox"/> Use of eco-friendly materials <input type="checkbox"/> Use of low consumption equipment <input type="checkbox"/> Other: _____	
For which figure(s) of the staff does the employer repond to this questionnaire?	

SECTION 2. STAFF EXPERTISE IN SUSTAINABILITY

<p><i>To what degree do you feel that the employees in your workplace should have the following competences? Please indicate the degree of need for each skill from 1-5 (1 equals to "Totally irrelevant" and 5 equals to "Very important").</i></p>	
FIELD	COMPETENCE
4. SUSTAINABILITY	<i>Understanding of sustainability challenges</i>
	Recognize the principal relations and problems between humans and environment
	Understand the environmental impact of food (for example on climate change and water use across the whole food system, not just within the operations of a restaurant)
	Understand the correlation between health and sustainable food
	<i>Sustainable practices</i>
	Adopt sustainable practices in one's job
	Know and be able to apply the environmental rules and certification criteria in the food service industry



Know which ingredients have the highest environmental impact
Identify and implement practices coherent with a sustainable management of waste
Be able to develop a menu focused on seasonal ingredients, produced locally, using smaller amounts of animal products in dishes and expanding plant-based dishes
Select sustainable production systems for all food and consumables
<i>Communication and network</i>
Communicate sustainable ambitions to staff and consumers
Build a network with local producers
<i>Measure of impact</i>
Be able to measure one's impact on the environment (use of water and energy, production of waste and greenhouse gas emissions, etc.)

SECTION 3. STAFF EXPERTISE IN ENTREPRENEURSHIP

<i>To what degree do you feel that the employees in your workplace should have the following competences? Please indicate the degree of need for each skill from 1-5 (1 equals to "Totally irrelevant" and 5 equals to "Very important".)</i>	
FIELD	COMPETENCE
1. IDEAS & OPPORTUNITIES	Identify needs and challenges that need to be met
	Develop several ideas and opportunities to create value including better solutions to existing and new challenges
	Explore and experiment with innovative approaches
	Visualise future scenarios to help guide effort and action
	Reflect on how sustainable long-term social, cultural and economic goals are, and the course of action chosen
	Act responsibly
2. RESOURCES	Identify and assess individual and group strengths and weaknesses, being determined to satisfy the need to achieve
	Make the most of limited resources
	Get and manage the competences needed at any stage, including technical, legal, tax and digital competences
	Get the support needed to achieve valuable outcomes
	Demonstrate effective communication, persuasion, negotiation, and leadership
	Interact, communicate and share information/content through digital technologies
3. INITIATE	Initiate processes that create value and take up challenges
	Act and work independently to achieve goals, stick to intentions, carry out planned tasks and adapt to unforeseen changes

Set long-, medium- and short-term goals
Define priorities and action plans
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
Handle fast-moving situations promptly and flexibly to solve conflicts and face up to competition
Work together and co-operate with others to develop ideas and turn them into action
Learn with others, including peers and mentors, and learn from both success and failure

As representative of industries in the food sector, what other competences would you define as required skills in the catering/restaurant sector, with particular reference to sustainability, digitalization, and soft skills that are not mentioned above? (open-ended question)

Annex 2

SECTION 1. INFORMATION ABOUT THE VET SCHOOL

Country where the VET school resides	
Name of the VET school	
Number of students	
Role of the respondent to the questionnaire	
E-mail of the respondent	
For which course(s) in the school does the respondent answer this questionnaire?	

SECTION 2. COMPETENCES RELATED TO SUSTAINABILITY

		<i>Which competences do you think students in VET courses in the food/catering sector SHOULD HAVE to be able to correspond to the labor market needs in that field? Please indicate the degree of need for each skill from 1-5 (1 equals to "No need" and 5 equals to "Very high").</i>	<i>Which competences ARE ACTUALLY ADDRESSED in the Curriculum of your VET centre? Please indicate the extent to which they are addressed from 1-5 (1 equals to "Not at all" and 5 equals to "Fully addressed")</i>
FIELD	COMPETENCE		
1. SUSTAINABILITY	<i>Understanding of sustainability challenges</i>		
	Recognize the principal relations and problems between humans and environment		
	Understand the environmental impact of food (for example on climate change and water use across the whole food system, not just within the operations of a restaurant)		
	Understand the correlation between health and sustainable food		
	<i>Sustainable practices</i>		



Adopt sustainable practices in one's job		
Know and be able to apply the environmental rules and certification criteria in the food service industry		
Know which ingredients have the highest environmental impact		
Identify and implement practices coherent with a sustainable management of waste		
Be able to develop a menu focused on seasonal ingredients, produced locally, using smaller amounts of animal products in dishes and expanding plant-based dishes		
Select sustainable production systems for all food and consumables		
<i>Communication and network</i>		
Communicate sustainable ambitions to staff and consumers		
Build a network with local producers		
<i>Measure of impact</i>		
Be able to measure one's impact on the environment (use of water and energy, production of waste and greenhouse gas emissions, etc.)		

SECTION 3. COMPETENCES RELATED TO ENTREPRENEURSHIP

	Which competences do you think students in VET courses in the food/catering sector SHOULD HAVE to be able to correspond to the labor market needs in that field? Please indicate the degree of need for each skill from 1-5 (1 equals to "No	Which competences ARE ACTUALLY ADDRESSED in the Curriculum of your VET centre? Please indicate the extent to which they are addressed from 1-5 (1 equals to "Not at all" and 5 equals to

		need" and 5 equals to "Very high").	"Fully addressed"
FIELD	COMPETENCE		
2. IDEAS & OPPORTUNITIES	Identify needs and challenges that need to be met		
	Develop several ideas and opportunities to create value including better solutions to existing and new challenges		
	Explore and experiment with innovative approaches		
	Visualise future scenarios to help guide effort and action		
	Reflect on how sustainable long-term social, cultural and economic goals are, and the course of action chosen		
	Act responsibly		
3. RESOURCES	Identify and assess individual and group strengths and weaknesses, being determined to satisfy the need to achieve		
	Make the most of limited resources		
	Get and manage the competences needed at any stage, including technical, legal, tax and digital competences		
	Get the support needed to achieve valuable outcomes		
	Demonstrate effective communication, persuasion, negotiation, and leadership		
	Interact, communicate, and share information/content through digital technologies		
4. INTO ACTION	Initiate processes that create value and take up challenges		
	Act and work independently to achieve goals, stick to intentions, carry out planned tasks and adapt to unforeseen changes		
	Set long-, medium- and short-term goals		

Define priorities and action plans		
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		
Handle fast-moving situations promptly and flexibly to solve conflicts and face up to competition		
Work together and co-operate with others to develop ideas and turn them into action		
Learn with others, including peers and mentors, and learn from both success and failure		

As representative of VET teachers in the food sector, what other competences would you define as required skills to be developed by VET students in the catering/restaurant sector, with particular reference to sustainability, digitalization, and soft skills that are not mentioned above? (open-ended question).