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Introduction

The objective of the Activity 2.2 «REPper Factory setting up» is to develop a framework in repair training and incorporate repair and circular economy approach into local vocational training circuit and curricula. In the first semester, a joint needs analysis of the repair sector in each partner's region was compiled, identifying the specific educational requirements necessary for workforce development, through surveys, interviews, and analysis of current trends. The analysis led to the identification of the category of the 8 local Hubs and their specialization. In the second semester of the project, the partnership will develop a portfolio of skills for repair trainers and business supporters. This portfolio will be the guide to launch the pilot training, which is the main target of the Factory. By utilizing this portfolio, trainers/stakeholders/learners/users can enhance their effectiveness, support the growth of repair businesses, and contribute to the sustainability of the repair economy. Establishing a REPper Factory to support the upskilling and reskilling of repair trainers will offer a high-quality training aligned with EU standards, helping to address disparities between Mediterranean regions.

1. The necessity of enhancing the skills of trainees/students and professionals/employees

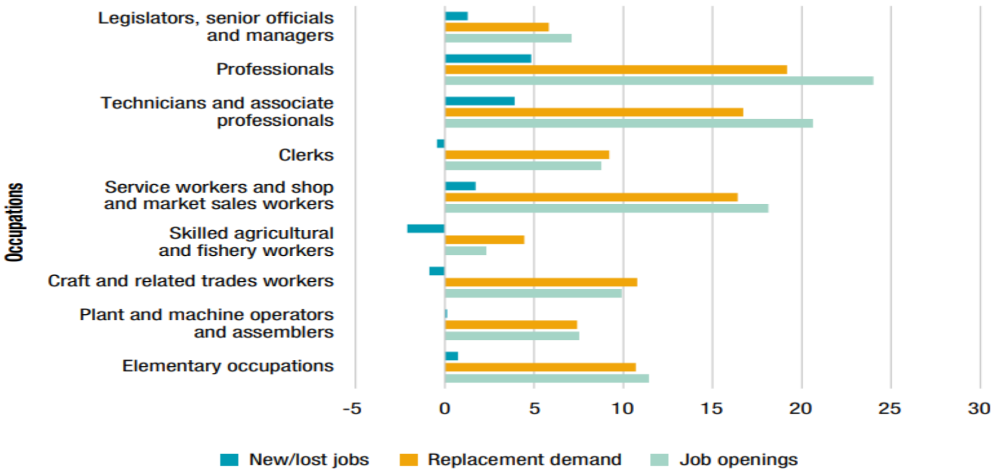
According to Peter Jarvis (2004) and Knud Illeris (2016), skill means being able to put into practice the knowledge acquired to respond competently to the demands and objectives related to professional activity, social roles, and the personal sphere of life.

In a rapidly changing world of work, reliable information on current and future labour market trends and skill needs is critical. Environmental change has been one of the key drivers of labour demand and skills supply across all sectors for the past years. Cedefop has been exploring the implications for jobs and skills for over a decade now. Since 2019, the European Green Deal (EGD) is the EU's new growth strategy, aiming at transforming the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use. Leaving no person and no place behind this transition is another pillar of the EGD. Implementing the EGD will affect all EU sectors and occupations, albeit in different intensities and directions.

Under the European Green Deal, a greener future is the European Union's new target. The energy crisis caused by the conflict in Ukraine has intensified these efforts. As Cedefop has shown, new occupations are emerging and existing ones changing, which makes up- and reskilling essential across the board. Some occupations are readily linked to the green transition, such as solar panel installers, but identifying 'green' occupations is not always so easy.

In the period up to 2035[1], employment in almost all occupations in EU-27 is expected to either increase or remain stable. The lion's share of job opportunities emerging up to 2035 will be for highly skilled occupations, which jointly amount to about 56% of total job openings (the combination of new/lost jobs and replacement needs). Many will likely be triggered by the implementation of the European Green Deal: developing 'greentech' requires a technical and/or engineering profile and managing the green transition will require organisations to employ people that can act as greening promoters and ambassadors (Figure 11).

Figure 11. **Job openings by broad occupational group (millions), 2021-35**



Source: Cedefop 2023 skills forecast.

Fast-growing fields include science, engineering, business, IT, and legal professions, as they drive innovation and adapt processes for trends like the green transition. The green transition is expected to become a driver of occupational, and in some cases sectoral, transitions for energy workers (Cedefop, 2021). Regional and sectoral-level analysis of current and expected shifts of that sort will help shape targeted policy implementation approaches, which go beyond training provision.

The 2023 Cedefop skills forecast highlights that while the European Green Deal affects all sectors, its impact is strongest in green-transition-critical industries like energy, manufacturing, construction, transport, and waste management, which are already significantly shaped by related strategies and regulations.

The shift toward sustainable production will impact all occupations and sectors, altering skill demands across the board. Alongside green-specific technical skills, transversal skills should be integrated into education and training at all levels. Vocational education and

[1] Skills in transition the way to 2035, Cedefop, Luxembourg: Publications Office of the European Union, 2023

training (VET) will be essential for delivering adaptable skill sets to meet the evolving needs of the green economy. (see box below)

What are the skills for the green transition?[1]

'Skills for the green transition' include skills and competences, but also knowledge, abilities, values and attitudes needed to live, work and act in resource-efficient and sustainable economies and societies. These are:

- **technical:** required to adapt or implement standards, processes, services, products and technologies to protect ecosystems and biodiversity, and to reduce energy, materials and water consumption. Technical skills can be occupation-specific or cross- sectoral; and
- **transversal:** linked to sustainable thinking and acting, relevant to work (in all economic sectors and occupations) and life. They are alternatively referred to as 'sustainability competences', 'life skills', 'soft skills' or 'core skills'

Education and training need to prioritise the development of technical job-specific skills for occupations critical for the green transition. Without such skills it is not possible to implement and mainstream the 'green' technologies and processes that are at the core of these occupations. In rapidly changing contexts, technical skills facilitating the green transition are symbiotic with soft ones, as the latter amplifies the impact of innovation via consumer and citizen engagement.

Green VET

Vocational Education and Training (VET) tailored to green skills, particularly in repair-related fields, plays a crucial role in supporting sustainable development and transitioning to a circular economy.

Green VET programs emphasize skills development in repairing and refurbishing technologies to reduce waste and promote resource efficiency. This includes training in sustainable construction practices, eco-friendly transportation maintenance, and appliance repair, all aligned with green economy goals. Their main goal is to prepare workers or stakeholders to emerge green jobs while ensuring their expertise supports environmental targets.

Learning objectives in Green VET often aim to instill a sense of responsibility toward the environment.

Trainees are educated on the broader impacts of their work, ensuring their practices contribute to sustainability. For instance:

- Understanding and minimizing carbon footprints in technical and industrial settings.
- Incorporating sustainable materials and processes into repair and maintenance activities.

2. Metaknowledge and green jobs

Meta-knowledge refers to the awareness and understanding of one's own cognitive processes, including knowing what one knows, how to learn, and the limitations of that knowledge. It involves self-regulation, strategic planning, and reflection to improve learning and problem-solving. Meta-knowledge includes understanding how to acquire and evaluate new knowledge, and it extends to knowing what others know or need. It's closely linked to critical thinking[2] and emerges around age 11, helping individuals monitor and adjust their learning strategies. This process involves conscious evaluation and planning for future learning actions.

Besides knowledge about acquisition of knowledge, its origin, applicability, and dependability, metaknowledge refers also to knowledge about what others know, about which information others need, and about how one's own knowledge can be utilized accordingly. A group that knows how to use this metaknowledge can establish a transactive memory[3].

In the context of repair work, "meta" carries the meaning of operating at a higher level of description. Specifically, it is defined as a prefix indicating something that deals with data about, or processes that act on, a given concept. For instance, if "X" represents a concept, then "meta-X" refers to information or operations concerning X. In this way, metaknowledge refers to a system's understanding of how it reasons, functions, or utilizes domain-specific knowledge.

An important kind of metaknowledge is knowledge about where to locate knowledge. Knowing where to look for textiles in your area is an example of metaknowledge[4]. Metaknowledge is crucial in the process of repairing because it enhances the efficiency

[2] META-DIAGNOSIS AND THE CULTIVATION OF META-COGNITIVE SKILLS

[3] (Handbook of Research on Computer Mediated Communication (chapter 32) Sigrid Kelsey, Kirk St.Amant))

[4] **Expert Systems: The Technology of Knowledge Management and Decision Making for the 21st Century 1st Edition**
by Cornelius T. Leondes (Editor)

and effectiveness of diagnosing, solving problems, in knowing one's gaps, choosing the right tools and methods, learning from previous repairs.

Overall, metaknowledge helps repair professionals become more self-regulated, efficient, and adaptive, ultimately leading to higher quality repairs and by extension, to customer satisfaction.

3. CEDEFOP: Aiding in the establishment of strategic policies to foster skill acquisition

Enterprises need people with the skills required to compete and provide high-quality goods and services. People need the right qualifications to find jobs. People with low levels of or no qualifications are nearly three times more likely to be unemployed than those with high qualifications. In the EU, around 75 million people, nearly a third of the working population, have low levels of or no qualification. Too many young people, around 15%, leave school without any qualifications. In this endeavor, CEDEFOP (European Centre for the Development of Vocational Training) is a valuable assistant and guide.

CEDEFOP is one of the EU's decentralised agencies. Founded in 1975 and based in East Thessaloniki, Greece, since 1995, Cedefop supports the promotion, development and implementation of the Union policy in the field of vocational education and training (VET) as well as skills and qualifications policies by working together with the Commission, Member States and social partners. To this end, it enhances and disseminates knowledge, provides evidence and services for policy-making, including research-based conclusions, and facilitates knowledge sharing among and between EU and national actors.

Cedefop is focusing on themes related to skills and market and analyses how changing economic and social megatrends, such as an ageing workforce and the digital and green transition, are creating new skills demands and skills mismatches and reshaping the future of work in EU workplaces; gathers and compares data from Europe and beyond to support the development of vocational education and training (VET) systems and institutions, that are responsive to the skill demands of labour market and society. Its work helps to improve the delivery of relevant and high-quality skills and competences to learners of all ages and at different stages of their careers and lives.

Cedefop Green Observatory (Cedefop GO)

As adopting more sustainable practices in production, consumption, and daily living is essential to addressing climate change and its global impacts, Cedefop GO focuses on how the green transition impacts jobs and skills across different sectors and professions within the EU. For this transition to succeed, young learners, workers, and all citizens must acquire the necessary skills, knowledge, and awareness. Vocational education and training (VET) play a pivotal role in facilitating these changes, supporting short-term transitions while helping establish a more sustainable future in the long term.

CEDEFOP[5] can **enhance our project's effectiveness** in building skilled repair professionals while:

- Offering insights into skills gaps, labor market trends, and future needs in the repair industry.
- Helping design vocational training tailored to repair skills, ensuring alignment with industry standards.
- Sharing successful case studies and models from across Europe to improve our project’s effectiveness.
- Supporting the creation of recognized qualifications for repair professionals, ensuring portability and recognition across Europe.

4. Purpose of the Skills Portfolio

The purpose of a skills portfolio for trainers/stakeholders/learners/users is to provide them with:

- access to their own skills documentation
- the ability to self-assess themselves on request
- insights into which areas they can improve their performance
- qualifications (capability to include or specify their own abilities or expertise)
- the ability to manage expiring skills. Expiring skills refer to abilities or knowledge areas that become less relevant or valuable over time due to changes in technology, industry trends, or market demands, e.g. knowing how to use outdated software.

[5] More information is provided on the website https://www.cedefop.europa.eu/en/about-cedefop/who-we-are?etransnolive=1

In terms of categorisation, in general, according to the literature (e.g., CEDEFOP, 2017; European Commission, 2016; ILO, 2017; OECD, 2019a; Kokkos and Pavlakis, 2015; Lindzeris, 2020), skills can be divided into three types. The **first type** is basic skills (writing, reading, basic text comprehension, basic mathematics, basic knowledge of technology and IT applications); **the second type** is technical/occupational skills, related to specific occupational functions, including digital ones. In recent years, both the European Union and Member States' policies have emphasised the development of digital and 'green' skills. The **third type** is an important group of skills, which some call 'horizontal', others 'generic' or 'soft' or 'life' or 'personality' skills, but all mean much the same thing, i.e. skills that are intrinsically related to all professional, social, and personal life activities.

5. List of skills

In order to develop the skills portfolio, all partners provided a list of skills for repair trainers and business supporters, according to the needs analysis of their region specified in the first semester. These data provided by all partners are compiled by ANATOLIKI SA to produce this deliverable.

Each partner (PP) provided:

a) a list of essential skills, qualifications, and competencies, the necessary technical expertise and skills, relevant to the repair economy sector they are focusing on in their respective countries (as identified by each partner during their needs analysis).

b) a list of qualification criteria needed for repair trainers and business supporters to ensure they meet industry standards, e.g. necessary certifications, experience, and training.

5.1 Contents and Insights

The skills gathered by the partners per each region will be listed in four categories. The following tables collect information about what the instructors have to do and what they have to obtain in order to be properly trained to teach some aspects of the repair sector. The partners filled in the following tables, which are divided in the four categories of skills. A short description of each category is provided here:

a) **Technical skills:** Practical, hands-on abilities related to diagnosing, repairing, and maintaining products. These are the skills that are necessary to better understand the technical aspects of the repair process.

b) **Management/Business skills:** Abilities required to effectively run and grow a repair business.

c) **Communication/Interpersonal skills:** The ability to effectively exchange information and build relationships with students, employees, customers, team members, and partners.

d) **Qualification criteria:** Standards or benchmarks that individuals must meet to demonstrate competency in repair-related roles.

The following data is collected per region, in order to provide clear indications and to allow the collection of different skills in this section. It is necessary to identify the main skills that are useful to each PP in order that they are able to create their own training of trainers' pathway. PP filled in the portfolio on the basis of the "repair sector" they identified during the previous semester. Finally, ANATOLIKI collected 8 tables in total.

5.1.1 ALBANIA

Technical skills	Management / Business skills	Communication / interpersonal skills	Qualification criteria
Diagnostic skills in electronic goods. Good knowledge of fabrics, latest fashion trends, sewing, cutting, colors etc., Experience in using specific tools regarding electronics and textile repair. Proficiency in troubleshooting, maintaining, and upgrading various products.	Skills on running a repair shop. Knowledge on financial management, inventory control, and customer service. Knowledge on marketing, pricing strategies, and customer acquisition.	Effective communication skills, including conflict resolution and customer service. Skills in fostering strong relationships with employees, partners, and customers.	Certification in specific repair techniques (e.g., electronics, textiles) Hands-on experience with relevant tools and materials. Up-to-date knowledge of industry standards and repair technologies. Knowledge of industry trends and market demand. Business management certification or workshop participation Demonstrated ability to work in team settings and mentor others.

Albania has identified electronics and textile sector as the two main directions of the Albanian repair hub.

The table above outlines the key skills and qualifications instructors, in the repair sector, need to have to effectively pass to their students.

Instructors need hands-on abilities in diagnosing and repairing electronics and textiles, along with familiarity with tools and industry standards demonstrated with ISO quality standards. This is essential to ensure students can perform repairs competently.

Instructors must understand business management, including financials and customer acquisition, to help future repair entrepreneurs run sustainable businesses.

Strong communication and customer service skills are important for instructors to teach students how to interact with customers and team members effectively. Instructors must meet regulatory standards, including certifications and safety requirements, to ensure the training provided is up to industry expectations.

5.1.2 BOSNIA & HERZEGOVINA

Technical skills	Management / Business skills	Communication / interpersonal skills	Qualification criteria
Skills related to electrical engineering Hydraulic technical skills Heavy machinery repair skills Brazing Small appliances repair skills (e.g. printers and IT equipment) BGA training for chip replacement	Basic work protocol skills Project management skills	Coaching and mentoring skills in IT sector Client communication skills	Brand certifications Industry certifications LLL trainings Circular economy topics to be included in educational programs across all levels of schooling

As previously declared, UNSA-SEBS from Bosnia & Herzegovina is working on setting up an awareness-raising Hub. In line with the project's objectives, these hubs will focus on "co-design, design thinking, and participatory processes" and will primarily "target citizens and NGOs." Consequently, the awareness hub in BiH aims to engage a wide range of stakeholders, each contributing significantly to the shift toward sustainable practices. By involving these diverse groups, the UNSA-SEBS awareness-raising hub can foster a comprehensive and inclusive strategy to promote repair and reuse principles across all sectors of society.

Through the activities implemented by REPper, and based on insights gathered from interviews, direct communication with stakeholders, and relevant secondary data obtained via desk research, several key skills have been identified as the most needed in Bosnia and Herzegovina's repair sector.

Companies specializing in recycling and reusing electronic waste struggle to find experts in electrical engineering, hydraulics, and heavy machinery repairs—skills essential for handling complex systems and ensuring efficient operations. Companies in the same sector face difficulties finding IT equipment repairers capable of both technical work and engaging in training, highlighting the need for professionals who can transfer knowledge and upskill others. In the mobile device sector, hardware repairs, such as brazing, are a major challenge, while companies in the printing industry report significant obstacles in finding expertise for printer repairs. These specific technical skills are critical for maintaining productivity and minimizing downtime.

There is also the need for specialized training, including smaller IT equipment repairs, printer maintenance, and BGA (Ball Grid Array) training for chip replacement, underscoring the industry's demand for highly specialized skill sets. A lack of basic work protocol knowledge among repairers was identified, seeking training to enhance professionalism, while another emphasized the need for better communication skills to improve client relations.

Moreover, many repair professionals stress the importance of professional certifications from various brands and industry bodies, which provide standardized skills and knowledge, ensuring quality service. The research also points to a broader issue: the lack of formal and informal education and training in areas crucial to the circular economy, with these topics being insufficiently included in educational programs at all levels.

5.1.3 FRANCE

No data was provided for the skills portfolio in France.

5.1.4 GREECE

Technical skills / Manufacturing skills	Management / Business skills	Communication / interpersonal skills	Qualification criteria
Upholstery, carpentry & fabric Repair Skills Hand Tool Proficiency Shoe Construction Knowledge Pattern Making and Design Hand Tool Proficiency Material Knowledge/ Hardware Knowledge Finishing and Polishing Skills Repair Techniques for Leather Goods like bags Sustainability and Eco-Friendly Practices Dying and Recoloring Techniques of Patching Knowledge and regular maintenance of machinery Tailoring Skills	Financial management Pricing and costing of repair services Supply chain management (sourcing textiles, fabrics, furniture materials) Marketing and promotion Time management and scheduling Project management Knowledge of national regulations and industry standards Quality control and assurance Knowledge of the business' code of ethics and professional conduct	Customer service and active listening Negotiation skills (pricing, timelines, expectations) Teamwork and collaboration with other repair specialists, and teaching – mentoring trainees or apprentices in the business Conflict resolution with dissatisfied customers or team members Building partnerships with suppliers, artisans, or subcontractors Presentation skills for marketing or demonstrating expertise Networking within the repair community or industry Creativity	Sustainable or Eco-Friendly Certifications Ability to meet quality and durability standards in repair jobs Adherence to safety and health standards (use of tools, chemicals) Specialized Vocational Training or Technical School Diploma in textile and clothing repair, tailoring, or fashion design. Workshops and Short Courses

The information provided for the Greek hub was gathered through interviews and communications with small businesses, amateur groups, Social Cooperative Enterprises, Sole Individual Private Equity Companies, and self-employed individuals, as well as through a literature review. This analysis reveals that the repair sector is highly complex, influenced by various interconnected and overlapping factors. As a result, professionals entering this field must acquire a wide range of skills, develop techniques, and gain knowledge in areas they often lack when starting their careers. Essential skills such as management, communication, technology, and finance are crucial to helping individuals who are or wish to become active in the repair sector succeed in today's dynamic economic environment.

In Greece, the knowledge available in the repair sector is often uncertified, and professionals frequently face multiple challenges related to financial, legal, and tax operations. Therefore, it is essential for individuals to receive both theoretical and practical training, using flexible methods (such as remote and in-person learning) to improve their skills and enhance their qualifications.

By utilizing the table as a reference, Small and Medium Enterprises can be supported in adapting to the evolving economic landscape of the repair sector.

5.1.5 ITALY

Technical skills	**Management / Business skills**	**Communication / interpersonal skills**	**Qualification criteria**
Diagnostic skills of small electronic objects. Maintenance skills. Expertise in repairing common small household appliances, such as disassembly techniques, identification of components that are most prone to failure, methods for conducting checks and repairs on electronic boards.	Logistic skills to find spare part of electronic objects. Fundraising skills, to find financial resources. Social media management skills, to promote repair services. Organization skills to create an order inside lab that can be easily understood by external people coming to the repair café	Communication skills, to promote repair services and to explain repair processes and outcomes to non-technical customers. Community organizing skills, to create knowledge-sharing environments about the repair economy at the community level. Facilitation skill to make easier to work in group and make	Previous experience in repair economy and direct hands-on experience. Technical certifications of repair trainers. Green skills, such as knowledge of the circular economy. Be informed about consumption patterns and sustainable approach to consumption, including awareness of recyclable materials.

Replacement skills, to replace specific components from various suppliers, often requiring knowledge of both current and older technology. Problem solving competence, to manage emergency or unpredictable situations in lab A bit of first aid competence, to manage little wounds during work		decisions in an assembly way	

Technical skills that are included in the table are tailored to the Italian hub, as they emerge from the needs that have been identified during interviews of the Joint Needs Analysis conducted in the territory. Italy also included communication and business skills and qualification criteria in the table, that can be considered as transversal to different repair domains and applicable across different sectors. In summary, technical skills selected by Italy include expertise in electronic repairs, diagnostic skills, and the knowledge of different materials and techniques. Key abilities involve diagnosing and maintaining small electronic objects and repairing common household appliances. Management skills that are specific to the repair sector are logistics skills for sourcing spare parts and fundraising skills to secure financial resources. Organizing the space (deciding where to put each spare part and tool) is often an underestimated competence, while it is essential to work in a space (for example the lab or the repair caffè) shared by more than one person, otherwise, most of the time of work would be wasted in searching. It is also essential to develop facilitation and decision-making skills, to avoid conflict unsolved between people who work in the lab space, and to help make decisions in an assembly manner. Communication skills include community organizing to foster knowledge-sharing, customer service skills to explain repair processes, and social media management to promote repair services. These skills are essential for effective interaction with customers and the broader community. Eventually, qualification criteria encompass hands-on experience with materials, prior expertise in the repair economy, and green skills related to the circular economy. These criteria ensure that trainers are informed about sustainable consumption practices and can effectively transmit their knowledge to all the people receiving the training.

5.1.6 PORTUGAL

Technical skills	Management / Business skills	Communication / interpersonal skills	Qualification criteria
Diagnostic skills of small electronic objects. Maintenance skills. Expertise in repairing common household appliances.	Social media management skills, to promote repair services. Management and financial knowledge for repair services Knowledge of consumer rights (warranties, mandatory information, repair timelines, etc.)	Communication skills, to promote repair services to consumers. Explaining warranty rights and repair timelines to consumers	Previous experience in the sector of repair. Green skills, such as knowledge of the circular economy, reuse, repair and recycling.

In Portugal, the Hub focuses on the repair of household appliances and electronic devices, including large appliances, electronic products, and small appliances. We will produce an online platform designed to raise awareness and empower consumers in the repair sector. It focuses on the public, not industry professionals, while still providing context on when professional help is needed. The website is directed to consumers and for this reason it won't offer professional-level information.

5.1.7 SLOVENIA

Technical skills	Management / Business skills	Communication / interpersonal skills	Qualification criteria
Understanding basic electronic circuits and the ability to trace and troubleshoot issues within these circuits. Knowledge of updating device firmware and troubleshooting software-related	Determining the **economic viability** of different types of repairs, ensuring that services remain profitable while aligning with sustainability goals. Effectively **managing tools**, spare parts, and skilled labour necessary for repairs.	Translating technical jargon into simple terms to help customers make informed decisions. Explaining technical repair processes to customers in a way that is easy to understand, with steps involved. Understanding customer concerns	A foundational knowledge of area is essential. For those working in the circular economy aspect, a background in environmental studies can provide an edge. Vocational technical training programs offer hands-on

issues that may cause malfunction. Understanding of ESD safety procedures to protect sensitive components during repair. Ability to use diagnostic tools (e.g., multimeters, oscilloscopes). Skill in repairing or replacing faulty components. Proficiency in soldering electronic components on printed circuit boards (PCBs) and desoldering for component replacement. Basic understanding of furniture construction and design principles to restore functionality without compromising the aesthetic. Proficiency with using fasteners like nails, screws, and adhesives, as well as fitting and aligning parts during repairs. Expertise in hand-sewing and using sewing machines. Skill in mending holes, tears, or worn-out fabric areas through techniques like darning, patching, or applique.	Ensuring that high-**priority** or urgent repair tasks are completed first, balancing workloads to meet customer demands or production timelines. **Sourcing parts from recycled or repurposed goods**, integrating sustainability practices directly into the repair process. **Identifying potential risks** (e.g., supply chain disruptions, technical issues) and creating mitigation strategies to prevent delays or financial losses. Producing engaging content that **educates consumers** on the benefits of repair versus replacement, particularly for environmental and cost-saving benefits. Using platforms like Instagram, Facebook, or YouTube to **showcase** repair work, customer testimonials, or educational content about extending the life of products. Ensuring that repair services are easily discoverable online, through search engine optimization (SEO) and targeted marketing strategies. Identifying and applying for grants or using crowdfunding	and preferences related to repairs, like specific issues with their devices or the desired aesthetic of restored furniture. Working closely with other repair technicians, designers, or customer service representatives to ensure an efficient and high-quality repair process. Sharing knowledge and expertise about specific repair techniques and helping train newer members of the team. Being aware of and sensitive to cultural values and preferences, mainly when working with textiles or traditional furniture that might have cultural or personal significance. Ensuring that repair services are accessible to a diverse range of customers, taking into account language barriers or different communication needs. Establishing relations with customers by being approachable and transparent about repair timelines, costs, and potential outcomes. Addressing any dissatisfaction or misunderstandings	experience and are beneficial. Experience through apprenticeship programs or hands-on repair workshops. Ability to diagnose and repair at a component level. Soldering and de-soldering skills are required for replacing or repairing electrical components. Knowledge of materials recycling to understand the breakdown of components for proper recycling, e.g., separating metals, plastics, and hazardous materials. Hands-on experience with electro-mechanical systems. Expertise in sanding, varnishing, staining, and painting to restore furniture surfaces. Ability to select and work with appropriate materials (e.g., wood, metal, fabric) for structural and aesthetic repairs. Understanding different fabric types and their properties (e.g., stretch, durability) to choose the right techniques and materials for repair. Ability to create or modify patterns to ensure proper repair or adjustment of textiles.

Knowledge of textile cleaning and stain-removal techniques to restore the appearance and integrity of fabrics.	platforms to **finance innovative repair solutions** or community repair workshops. Building relationships with environmental NGOs, governments, or corporate social responsibility programs to fund repair initiatives that reduce waste. Developing budgets that account for labour, materials, and overhead costs while ensuring affordability for customers seeking repair services. Providing **warranties** or follow-up services to ensure customer satisfaction and trust in the repair business. Consider **Life Cycle Assessment** (LCA) to understand the environmental impact of products and repairs to guide decisions about which materials or techniques to use in the repair process. Ensuring repair operations meet **national or EU standards**. Developing **Quality Assurance protocols** to maintain high-quality repairs. Understanding **market demand** for repairs in specific sectors and adjusting services or pricing to	professionally and finding solutions that meet customer expectations. Offering clear explanations of repair options, the extent of damage, and potential costs, helping customers feel more comfortable with the repair process. Educating customers on how to prevent future damage.	Familiarity with diagnostic software tools for troubleshooting modern electronics. Special training in eco-friendly repair techniques and low-energy repair methods.

	meet customer needs. Incorporating **new technologies** (e.g., 3D printing for replacement parts) or methods (like modular repairs) to differentiate services and attract more customers.		

After identifying the needs for Slovenian Hub, we decided to work on a horizontal scope addressing repair sectors (EEE, furniture and textile) in the B2B approach. Analyses we made showed that the indications provided in the table above are necessary to have a complete set of activities that will determine the success of the operation of the Hub. We aim to include individuals, businesses, and high-profile service providers in the Hub's activities to cover the needs of all and to be able to present a financially sustainable business model that incorporates training programs, provides digital literacy courses, etc. We will engage prominent media and communication experts to promote repair initiatives and give a good example of publicizing the repair content effectively. Only specialized (online) courses and hands-on training can enhance skills and upskill individuals. Based on our expertise, we can support SMEs by offering proposals and assisting with funding and co-financing opportunities.

5.1.8 SPAIN

Technical skills	Management / Business skills	Communication / interpersonal skills	Qualification criteria
Repairing large and small household appliances Knowledge of hydraulic plumbing, mechanics, refrigeration, and electronics to repair electrical appliances Diagnosing electrical and electronic issues Handling of electronic systems	Management and financial knowledge for repair services Knowledge of consumer rights (warranties, mandatory information, repair timelines, etc.) Training of repairers by SMEs Continuous training programs for repair	Effective customer communication Clear explanations of repair processes to consumers Explaining warranty rights and repair timelines to consumers Ability to foster a self-repair culture among citizens combining environmental and	**For electrical appliances:** Vocational training (FP) in: 1) Machines and Tools, 2) Installation and Maintenance, 3) Electricity and Electronics Certificate of Professionalism in "Repair and Maintenance of

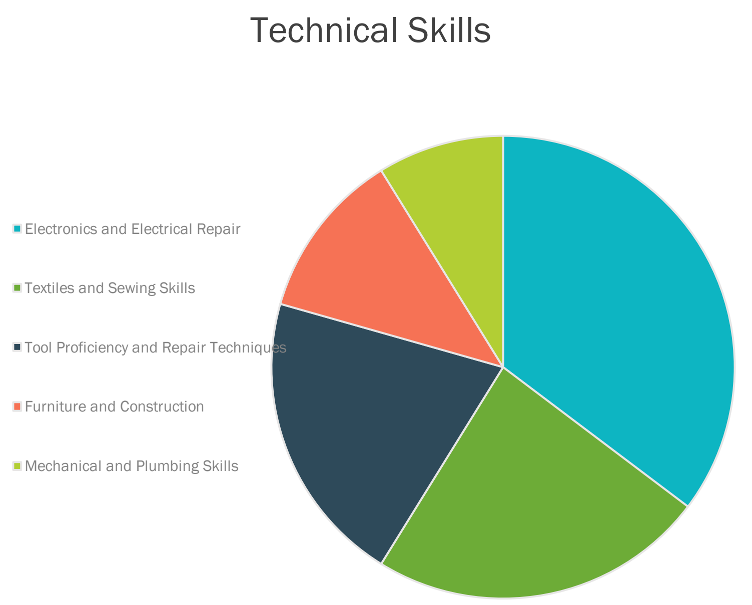
	technicians by manufacturers.	technical repair knowledge.	Household Appliances” **For electronical devices:** Vocational training (FP) in: 1) Higher Technician in Electronic Maintenance 2) Electricity and Electronics 3) Electronic equipments Certificate of Professionalism in “Assembly and Repair of Microcomputer Systems” **For all:** Knowledge of consumer rights

In Spain, the Hub focuses on the **repair of household appliances and electronic devices**, including large appliances, electronic products, and small appliances. The Spanish Hub is an online platform designed to raise awareness and empower consumers in the repair sector. It focuses on the general public, not industry professionals, while still providing context on when professional help is needed. Although it won't offer professional-level information, understanding the industry is key, as consumers often need expert assistance when they can't repair their appliances on their own.

For **repair professionals**, it is essential to have technical skills not only for diagnosing and repairing large and small household appliances but also for understanding hydraulic plumbing, mechanics, refrigeration, and electronics. In addition, training in consumer rights is essential, covering rules about warranties, information and repair timelines. This focus on consumer education enhances effective communication and fosters a self-repair culture, blending environmental awareness with technical knowledge. The shortage of qualified repair personnel, particularly in the appliance sector, is explained partly from low salary prospects and a lack of promotion for the profession. To address this issue, repair companies must include among its management skills the training of new technicians, while manufacturers play a vital role in developing continuous training programs. Ultimately, integrating vocational training and professional certification into repair careers can elevate the standards of the industry and ensure that technicians are well-equipped to meet consumer needs.

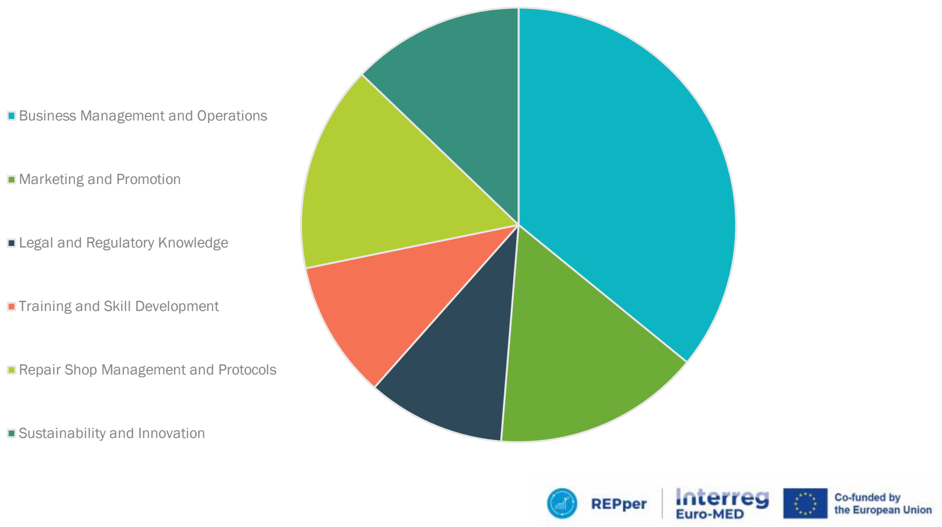
Summary of skills

The skills presented on each country's table could be organised in the following main categories and presented in total in pie diagrams.



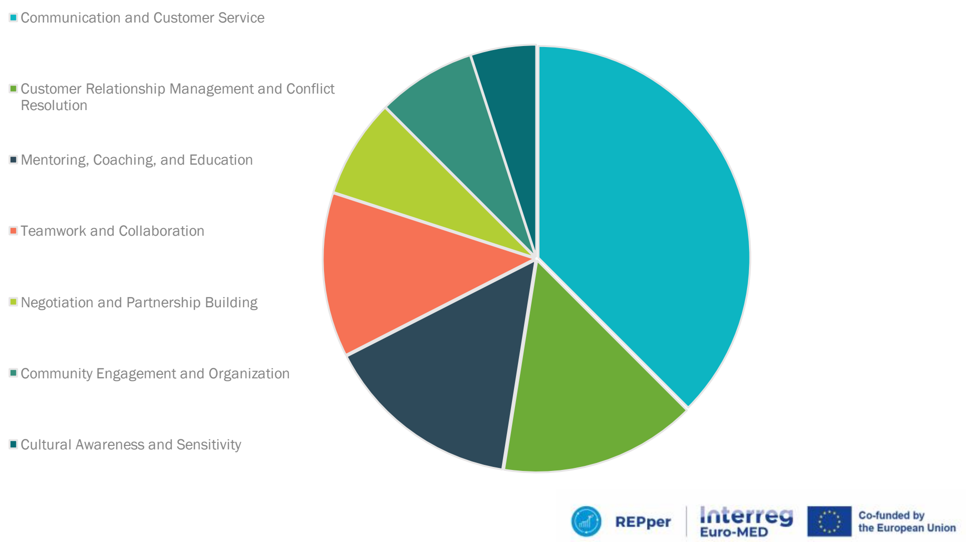
Electronics and electrical repair skills along with textiles and sewing skills were the predominant technical skills.

Management/Business Skills

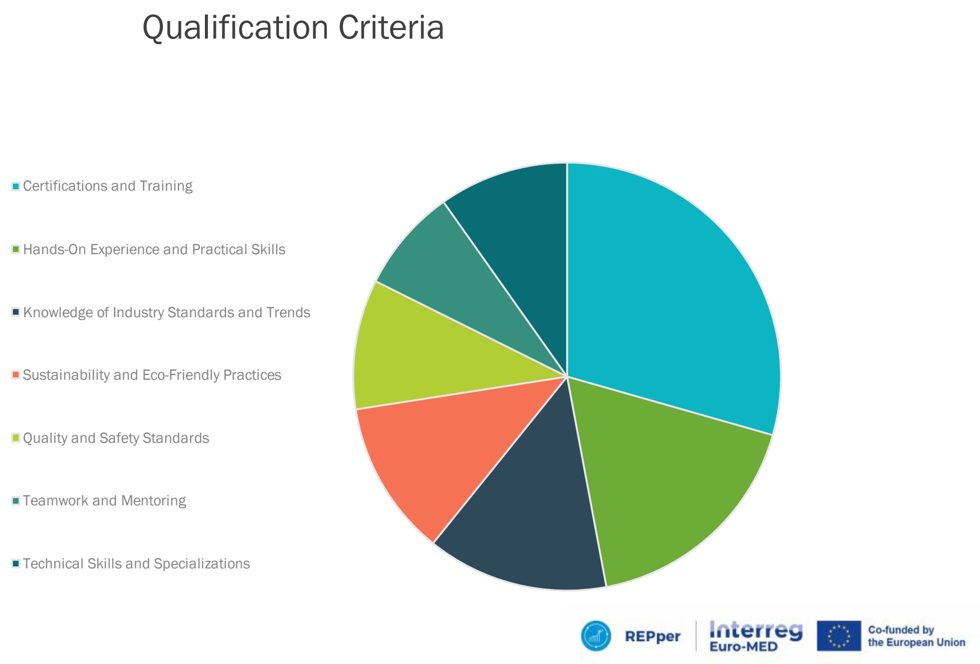


Business management and operations skills along with the marketing and promotion skills were the predominant ones in the managing sector.

Communication/Interpersonal Skills



Customer service skills are really powerful and demanding in interpersonal skills.



Certifications and hands-on skills seem really important in qualification criteria category.

To sum up with the repair sector initiatives and challenges within the 8 countries of the partnership, **Albania** focuses on electronics and textiles, emphasizing instructors' skills in diagnostics, repairs, business management, communication, and regulatory compliance to prepare students for sustainable repair careers. **Bosnia & Herzegovina** prioritizes creating an awareness hub involving diverse stakeholders to promote repair and reuse. The repair sector lacks specialists in areas like electrical engineering and IT repairs, highlighting the need for professional certifications and training in advanced skills. **Greece** spots that the sector faces challenges with financial, legal, and tax operations, often relying on uncertified knowledge. Flexible theoretical and practical training is needed to address skill gaps in management, communication, technology, and finance. **Italy** highlights the need for technical repair skills, logistics, conflict resolution, and communication, along with community engagement. Expertise in sustainability and green practices is also essential. **Portugal and Spain** both focus on empowering consumers via online platforms. While Portugal's platform primarily raises consumer awareness, Spain emphasizes education in consumer rights, self-repair, and technical repair skills to address the technician shortage. **Slovenia** adopts a B2B approach addressing various sectors (electronics, furniture, and textiles), offering specialized training and support for SMEs, including funding assistance and digital literacy courses.

These initiatives reflect the diverse approaches and challenges in enhancing the repair economy across Europe.

6. Teaching/training methods & tools

Teaching[6] is a purposeful and professional activity aimed at bringing about positive change in learners. To teach effectively, educators are guided by principles of teaching and learning that have significant implications for their practice.

According to Ayeni (2011), teaching is a continuous process that involves bringing about desirable changes in learners through use of appropriate methods. Adunola (2011) indicated that to bring desirable changes in students, teaching methods used by educators should be best for the subject matter. Furthermore, Bharadwaj & Pal (2011) sustained that teaching methods work effectively mainly if they suit learners' needs since every learner interprets and responds to questions in a unique way (Chang, 2010). As such, alignment of teaching methods with students' needs and preferred learning influence students' academic attainments (Zeeb, 2004).[7]

Teaching and learning are the two sides of a coin. The most accepted criterion for measuring good teaching is the amount of student learning that occurs. There are consistently high correlations between students' ratings of the "amount learned" in the course and their overall ratings of the teacher and the course. Those who learned more gave their teachers higher ratings (Cohen, 1981; Theall and Franklin, 2001). This same criterion was also put forth by Thomas Angelo, when he said; "teaching in the absence of learning is just talking." Doyle.T. (n.d.). A teacher's effectiveness is again about student learning. [8]

CLASSIFICATION OF TEACHING/TRAINING METHODS[9]

There are two main types of teaching methods, non-participatory method and participatory method.

*1. Non-Participatory method***:** In these methods, the teacher takes on the role of subject matter expert, positioning themselves as the authority in the classroom. Students are viewed as passive recipients of information, absorbing knowledge presented by the teacher. Common examples of this approach include the lecture method and demonstration method.

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[6] Pedagogy - Different Methods and Techniques of Teaching, TECNIA INSTITUTE OF ADVANCED STUDIES NAAC Accredited Grade 'A' Institute Internal Quality Assessment Cell IQAC Ref. No.: TIAS/IQAC/2021-22/115, 01.12.2021

[7] Teaching Methods and Students' Academic Performance Elvis Munyaradzi Ganyaupfu Department of Economic and Business Sciences; PC Training & Business College; South Africa

[8] EFFECTIVE TEACHING METHODS AT HIGHER EDUCATION LEVEL Dr. Shahida Sajjad Assistant Professor Department of Special Education University of Karachi. Pakistan

[9] Dr. Arvind Kr. Gill & Dr. Kusum (Pg. 6692-6697) 6694 Copyright © 2017, Scholarly Research Journal for Interdisciplinary Studies

2. Participatory methods: In other words, interactive or learner-centered teaching methods emphasize continuous interaction and active engagement between teachers and students, where ideas and perspectives are frequently exchanged. Unlike traditional methods, which view students as passive recipients of information, these methods encourage students to actively construct their own knowledge with guidance. Best suited for small groups, these approaches help improve knowledge retention and are widely used in modern education. Examples include discussions, Q&A sessions, project-based learning, and problem-solving activities.

Below, indicative methods that could be suitable for the repairers' training are presented:

Differentiated instruction[10] is a teaching method that aims to meet the diverse needs of students by adapting lessons, activities, and assessments to suit individual learning styles, abilities, and backgrounds. This approach is based on the understanding that students are unique and learn in various ways, so a one-size-fits-all approach may not fully engage or support everyone. By offering a variety of learning activities and assessments, teachers can help each student build on their strengths and address areas for improvement, promoting a more tailored and inclusive educational experience.

Project-based learning (PBL) is a teaching method that emphasizes hands-on, real-world projects and collaborative problem-solving. In PBL, students work on a task over an extended period, aiming to create a tangible outcome, like research papers, multimedia presentation, community service project, or product design. This approach is often interdisciplinary, combining concepts from multiple subjects.

Group learning, or collaborative learning, is a teaching method that focuses on social interaction and teamwork, allowing students to work together in small groups to complete assignments, solve problems, and learn from one another. This approach aims to boost student engagement, enhance critical thinking, and build a strong sense of community.

Individual learning, or self-directed learning, is a teaching method where students take responsibility for their own learning. In this approach, students set their own goals, choose materials, and progress at their own pace, while the teacher provides guidance and resources rather than direct instruction.

Demonstration Method: A demonstration involves showing, performing, or explaining key concepts to students. This technique is often utilized within a broader teaching method and can also serve as a standalone instructional approach. In this context, the teacher's role is to illustrate how to perform a task or convey a principle by first verbally explaining the nature of the activity, followed by a systematic demonstration, and finally allowing students to replicate the task. Demonstrations are particularly effective for teaching psychomotor skills and concepts that require hands-on knowledge.

[10] https://vietnamteachingjobs.com/types-of-teaching-methods/

Using Visual Aids: Visual aids are essential tools that enhance the learning environment, making it more engaging and effective. By capturing interest and fostering deeper understanding, they help create a dynamic, welcoming atmosphere. Digital presentation tools, like PowerPoint, are particularly useful in training, especially for bridging language barriers, as they can clarify and reinforce the trainer's message with visuals and translated text. Images, such as photos, illustrations, charts, and videos, often communicate learning points more powerfully than text alone, helping participants connect with and retain content.

Varied teaching methods can target specific learning outcomes. Hands-on activities and group projects effectively promote collaboration, problem-solving, and critical thinking, while traditional lectures are better suited for introducing new concepts and foundational knowledge.

How to evaluate learning outcomes?

Training program evaluation is the regular analysis of how efficient and effective training programs are. This process includes collecting participant feedback, assessing job performance improvements post-training, aligning with corporate strategic goals, and much more.

The reason[11] for evaluating is to determine the effectiveness of a training program. It allows companies/trainers /contractors, etc. to make sure that the time spent help trainees learn and grow. It shows what worked well and what didn't, so future training can be improved. Finally, it checks if the training helps people do their jobs better, which is the main goal.

The processes of training evaluation can be divided into five steps:

Step 1: Identify the Purposes of Evaluation (Why do we want to evaluate the training program)

The reason for evaluating our training is to determine the effectiveness of a program by determining whether the objectives of the training were achieved, how the knowledge

[11] Evaluating Training Programs by Donald L. Kirkpatrick and James D. Kirkpatrick Published by Berrett-Koehler Publishers

and skills learned in the training are put into practice by trainees and assessing the results and impacts; and secondly ways in which it can be improved. The question is, how can it be improved? In looking for the answer to this question, you should consider these eight factors:

1. To what extent does the subject content meet the needs of those attending?

2. Is the leader the one best qualified to teach?

3. Does the leader use the most effective methods for maintaining interest and teaching the desired attitudes, knowledge, and skills?

4. Are the facilities satisfactory?

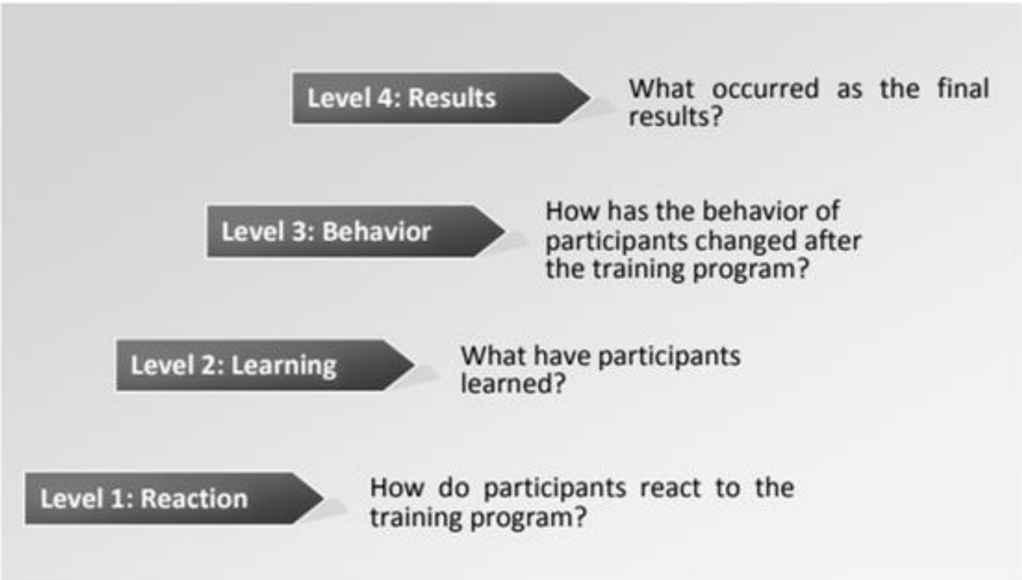
5. Is the schedule appropriate for the participants?

6. Are the aids effective in improving communication and maintaining interest?

7. Was the coordination of the program satisfactory?

8. What else can be done to improve the program?

Step 2: Select Evaluation Method in 4 levels



Level 1. Evaluation on this level measures how participants react to the training program.

Level 2. Do participants change attitudes, improve knowledge, and/or increase skills because of attending the training program?

Level 3. Has the participants' behaviour changed because of attending the training program?

Level 4. Evaluation measures the results that occurred because the participants attended the training program, e.g. increased production, improved quality and meet costumers' needs.

Step 3: Design Evaluation Tools (Questionnaire Pre/Post Test Impact Survey)

Training evaluation tools are what you use to assess training programs. They typically fall into four categories: questionnaires, interviews, focus groups, and observations. For the most thorough and accurate assessment, it's common to use these training evaluation methods together.

Step 4: Collect Data (Who, when, how to collect data)

Purpose: Explain the aim of collecting data, that is to gain insights into the training program's effectiveness, evaluate participant feedback, and identify areas for improvement. The information gathered will be utilized to enhance future training sessions and address any concerns raised by participants.

Step 5: Analyse and Report Results

Data analysis: The analysis should be as simple as possible and limited to what is necessary to draw the required conclusions from the data.

7. How to leverage this portfolio for effective training of trainers

This guide for repair trainers and business support trainers provides information and material that sets the basis for a strategic workshop approach to competence/skills development and lifelong learning. It can be used as a stand-alone version for capacity building or preferably as support - either in part or in its entirety - for a two or three-day workshop, depending on the needs of the participants. It provides an opportunity for repair trainers and business support workers, from different backgrounds to reflect on ideas, engage with important issues, jointly develop knowledge and skills and take the message of skills development and lifelong learning to the workforce.

Training the trainers (TTT) is an integral component of job development and knowledge transfer – it offers a multitude of compelling benefits that resonate with the modern business landscape:

Skill Enhancement

For repair trainers and business supporters, TTT programs not only enhance technical expertise but also build key skills in communication, problem-solving, and leadership. Trainers learn how to effectively teach repair techniques and processes, while business supporters gain skills to better assist with operational and strategic needs.

Increased Training Capacity

Developing internal trainers helps businesses scale their training efforts, enabling them to train more technicians and support staff without needing external consultants. This is especially valuable in industries with large teams or high turnover, allowing for continuous skill development.

Improved Knowledge Transfer

Internal trainers facilitate the transfer of critical knowledge, ensuring that repair techniques, best practices, and operational processes are consistently passed on throughout the organization. This improves service quality and operational efficiency.

Empowerment & Engagement

Investing in internal trainers empowers employees to take ownership of their learning and development. This increases job satisfaction and engagement, leading to higher productivity and better outcomes for the business, from improved repair quality to enhanced customer service.

Conclusions

Continuous learning is crucial for repair trainers and business supporters for several key reasons. First, it helps you stay up to date with the latest tools, technologies, and techniques in the repair industry. With constant advancements in equipment and repair methods, staying current allows you to offer the best solutions to clients and ensure high-quality service.

Second, continuous learning enables you to expand your skill set, whether it's mastering new repair methods or learning how to support businesses more effectively. As customers’ needs evolve and new challenges arise, ongoing education ensures you're prepared to tackle them and provide relevant advice and guidance.

Finally, continuous learning contributes to personal and professional growth. By challenging yourself to acquire new knowledge, you broaden your expertise, enhance your problem-solving abilities, and become a more resourceful trainer or business supporter. This leads to improved job satisfaction, better client relationships, and the potential for career advancement.

To stay up to date with industry trends and developments, repair trainers and business supporters should focus on continuous learning and active engagement.

By staying proactive in learning and networking, repair trainers and business supporters can remain competitive, enhance their expertise, and offer the best support to clients.

Building a Sustainable Future Together OR Repairing the Future

Repairing the future means more than fixing what's broken—it's about transforming the way we think, create, and live. The individuals and organizations in this portfolio have shown that repair is a catalyst for change, a tool for empowerment, and a foundation for progress.

In a rapidly evolving world, the skills and knowledge required to repair our tools, devices, and infrastructure are more vital than ever. The professionals highlighted here are leading the charge, equipping businesses, individuals, and communities with the expertise to adapt and thrive. The future of repair is bright. It rests on the dedication of those who strive for excellence, share their knowledge, and uplift others.

Prepare to face the challenges of tomorrow, today...

REPper | Interreg Euro-MED | Co-funded by the European Union

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