

CoVE Case Studies

Annex to the report 'Advancing European Centres of Vocational Excellence (CoVEs): An Analysis of Erasmus+ Projects'

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1. 3LoE – Three-level Centres of Professional Excellence

1.1. About 3LoE

Background information

- **Project name:** 3LoE: Three-level Centres of Professional Excellence: Qualification, Entrepreneurship and Innovation in the Green Economy
- **Duration:** 2020-2024
- **Call year:** 2019
- **Project status:** Completed

3LoE was a CoVE project led and coordinated by Hanse-Parlament. It involved 21 partners from seven countries and 60 associated partners from 13 countries, establishing eight CoVEs focused on the green economy.

Objectives of the CoVE project

Meeting urgent challenges in energy, climate, and environmental protection requires innovation and a strategic shift – particularly for SMEs facing a growing skills shortage, demographic changes, low training rates, limited innovation, and weak links with education providers.

The 3LoE CoVE project called for a fundamental shift in how VET is delivered, moving from traditional, school-based approaches to dual training models that combine classroom instruction with structured, work-based learning in SMEs. This model addressed several core issues:

- It bridges the gap between theoretical knowledge and practical skills.
- It aligns more closely with labour market demands, especially in the green economy sectors.
- It provides SMEs with early access to skilled future employees and boosts their innovation capacity.
- It empowers learners by offering real work experience, better employability, and smoother transitions into the labour market.

1.2. Activities of 3LoE and skills developed

Activities covered

The 3LoE project has established eight CoVEs in Austria, Germany, Italy, Latvia, Lithuania, Poland, and Spain to develop, test and implement training programmes.

The activities of 3LoE are as follows¹:

- **Teaching and Learning (Cluster 1):** 3LoE develops vocational programmes (EQF 3–6) with a strong focus on dual training and work-based learning. Curricula integrate green skills, digitalisation, and entrepreneurship. “Train the Trainer” initiatives boost teaching quality across CoVEs.
- **Cooperation and Partnerships (Cluster 2):** 3LoE builds regional networks by engaging SMEs, chambers, and international partners. These collaborations ensure training programmes are industry-driven and closely linked to labour market needs.

¹ 3LoE Overview of main activities and results of the project: <https://3-loe.eu/wp-content/uploads/Overview-of-main-activities-and-results-of-the-project.pdf> (the information in section 2.1 is drawn from this publication)

- Governance and Funding (Cluster 3): Each 3LoE regional CoVE operates under structured cooperation agreements and develops long-term business plans. While anchored in EU funding, 3LoE promotes diversified financing and policies that support lasting vocational excellence.
- The 3LoE COVEs are designed as multi-stakeholder ecosystems and are based on binding cooperation agreements and, in one case (CoVE DE Hamburg), on a national law.
- Each CoVE partnership involves a VET school, a chamber of commerce, a crafts association or SME association and a university. The aim is to improve qualifications and meet employer demands for young professionals and entrepreneurs.
- VET colleges and universities support curriculum development, provide academic staff, and deliver dual higher education programmes tailored to the needs of SMEs.
- SMEs contribute to the development of training content, including dual training programmes, host learners, and participate in innovative R&D projects with universities
- Chambers of commerce and crafts facilitate connections between companies and education providers, ensure employer representation, and help coordinate local implementation.
- Public authorities and ministries provide regulatory support, validate qualifications, and help integrate VET outcomes into national qualifications frameworks (NQFs).

The CoVE partnership model has in-built mechanisms for internal and cross-border exchange of best practices. A core goal of 3LoE was to build sustainable, structured cooperation between the seven COVEs and their extended networks through:

- Joint development projects: Cross-national working groups collaboratively designed curricula, teaching materials, and qualification standards. These were tested in multiple countries to reflect diverse national contexts.
- Train-the-trainer seminars and workshops: Seven dedicated programmes (covering dual VET, digital skills, and innovation advisory) were developed and piloted across partner institutions, enabling mutual learning and standard-setting.
- Evaluation cycles: Continuous assessment of teaching methods, and delivery models across all CoVEs fostered adaptive improvements and shared learning.
- International conferences and work meetings: Four major conferences and numerous transnational workshops enabled structured knowledge transfer and stakeholder engagement across sectors and countries.

A major achievement of the 3LoE project was the formal inclusion of 70 associated partners – including vocational schools, chambers, universities, and SME associations – from 13 EU countries. This shows the outreach of 3LoE: the project's beneficiary organisations, through their own links, have involved further specialist organisations assisting with the implementation of 3LoE activities. The strategy to integrate them involved:

- Initial needs assessment: Surveys and bilateral dialogues identified partners' expectations and areas of interest (e.g., green skills, innovation services, dual training).
- Targeted involvement in pilot activities: Associated partners were invited to test educational measures, participate in evaluations, and join dissemination events to build ownership and relevance.
- Structured implementation advice: Tailored consultations helped partners adapt and embed project outcomes in their own institutions and national systems.
- Scalable cooperation tools: Transfer models, adaptable templates, and guidance documents supported replication and localisation of key outputs (e.g., digital VET modules, innovation tools for SMEs).

- Integration into the international CoVE network: The associated partners were given access to all project tools and the digital collaboration infrastructure, positioning them as long-term contributors to the CoVE ecosystem.

This multi-tiered approach fostered broad buy-in and readiness for transfer, laying the groundwork for sustained, EU-wide impact.

Overall, 3LoE engaged 5,780 participants, including:

- 4,909 learners and students
- 293 teachers and trainers
- 578 companies

Skills developed

The 3LoE CoVEs developed and implemented 59 vocational education, further training, and study programmes across EQF levels 3-7. These included dual training pathways, teacher and SME trainer programmes, business idea challenges, and advanced courses in green technologies².

These programmes were designed to strengthen both transversal and job-specific skills. Learners developed core competences such as critical thinking, problem-solving, teamwork, and adaptability – essential for navigating a rapidly changing labour market.

At the same time, training was tailored to the needs of key sectors such as the green economy, hospitality, tourism, engineering, and ICT. A strong emphasis was placed on digital and green skills, integrating sustainable practices, digital literacy, and eco-friendly technologies throughout curricula.

In addition to sectoral skills, training also focused on:

- Entrepreneurship and dual education, fostering business acumen and practical work-based learning
- Renewable energy technologies, addressing the growing demand for expertise in sustainable energy
- Circular economy principles, promoting resource efficiency and waste reduction.

To ensure alignment with EU-wide standards, 3LoE embedded recognised competence frameworks into curriculum development, as confirmed by the project coordinator. DigComp guided the integration of digital literacy, cybersecurity, and ICT proficiency. GreenComp, though introduced midway through the project, provided a foundation for sustainability-oriented modules, including those on energy efficiency and waste management. The EntreComp framework structured entrepreneurship training, focusing on value creation and innovation.

3LoE also addressed digitalisation in higher education by developing an Advanced Digital Skills programme for university teachers and stakeholders. The programme enhanced participants' ability to use advanced digital tools and methodologies and was delivered in two editions due to high demand.

Supporting the professional development of educators was a key priority. A total of seven Train-the-trainer programmes were implemented, focusing on digital skills, VET school management, dual education delivery, and university–industry cooperation. These programmes promoted collaboration with industry and innovation in teaching. Teachers and trainers benefited from continuous professional development, enabling them to stay current with evolving pedagogical practices and technological change.

² 3LoE Overview of main activities and results of the project: <https://3-loe.eu/wp-content/uploads/Overview-of-main-activities-and-results-of-the-project.pdf> (the information in section 2.2 is drawn from this publication unless otherwise indicated)

A specific train-the-trainer seminar was developed, piloted, and implemented for management and teaching staff in vocational schools. This aimed to ensure that qualified personnel were available to deliver dual training programmes, especially in areas aligned with the green economy. Based on the needs of project partners, the team developed school and company curricula, as well as exam regulations, for the following professions:

- Electronics Technician for Industrial Engineering
- Vehicle Mechatronics Engineer
- Plumber
- Sewage Engineering Technician
- Environmental Technologist

3LoE also prioritised the integration of training courses into national curricula, combining theoretical knowledge with strong practical components. The project worked with expert groups comprising employers and vocational teachers to identify job-specific skills and develop relevant qualifications, such as Service Technicians for Heating Systems and Technical Consultants for Energy Efficiency. This ensured the programmes remained demand-driven and aligned with national and regional labour market needs.

1.3. Results achieved

Contribution to the development of qualifications

The 3LoE project developed, implemented and tested new programmes and qualifications addressing the green transition and aligned with EQF levels 3-6 across all CoVEs based on the principles of the German dual system of vocational education and training. These dual programmes combine work-based learning with academic education, equipping students with both theoretical knowledge and practical skills, designed to meet skills demands across a range of sectors.

In Austria, Germany, Latvia, and Lithuania, these qualifications were either integrated into national curricula or officially recognised as extracurricular qualifications.

For example, in Austria, nine new qualification profiles were created. Among these, the Technical Consultant for Energy Efficiency stands out as the first formal qualification recognised under Austria's new Higher Vocational Education Act, adopted in May 2024 while the other eight qualifications are in the process of being formalised and integrated into the NQF³. This includes adapting qualification standards and examination regulations in line with the new Act. On the other hand, In Poland, the recognition process is still ongoing due to administrative hurdles, according to the Polish consortium partner interviewed.

Other notable new dual bachelor's programmes developed by 3LoE include:

- Entrepreneurship & Innovation in the Green Economy: Developed and implemented by CoVEs Latvia and Lithuania.
- Electrical and Automatic Equipment: Developed by CoVE Lithuania and implemented during the project.
- Logistics – Green Supply Chains: Developed and implemented by CoVE Poland. The programme includes a concept and curriculum, an implementation report, and an evaluation plan. It prepares candidates for leadership roles in the logistics sector.
- Sustainable Building System Technology: Developed and implemented by CoVE Austria. This programme offers comprehensive theoretical education and practical training in sustainable building technologies, preparing graduates for both technical and managerial roles.

³ Interviews with the Austrian consortium partners

- **Sustainable Restaurant Worker:** A two-year training course developed by CoVE Lithuania to address staffing shortages and sustainability knowledge gaps in the hospitality sector. Trialled with 15 students and now fully implemented, the programme equips learners with practical green skills in gastronomy.

To ensure the recognition of qualifications, the 3LoE CoVEs continue to engage with national authorities, working closely with ministries of education, accreditation bodies, and industry partners, according to the project coordinator.

The training courses developed under the 3LoE project have been integrated into formal curricula in partner countries, guaranteeing that students receive recognised learning outcomes. This has also supported the transnational recognition of qualifications, increasing the employability and competitiveness of CoVE graduates across the European labour market.

Contribution to enhancing the quality and attractiveness of VET

The 3LoE CoVE project has had an impact on VET systems at local, regional, and national levels by modernising curricula, integrating green and digital skills, and fostering closer collaboration between education providers and industry, according to the consortium partners.

Through lobbying and engagement with national stakeholders, the 3LoE CoVEs in the eight partner countries advocated for the adoption of dual vocational training and work-based learning, contributing to a more open and flexible approach to VET in the programmes developed for the sectors concerned. From the project coordinator's perspective, the involvement of SMEs was crucial for the development and integration of this dual approach to VET across the programmes developed, especially in countries with traditional school-based VET systems (e.g. Poland, Latvia, Lithuania). SMEs collaborated with VET schools and universities in each of the 3LoE CoVEs to provide the work-based learning placements complementing the theoretical learning.

3LoE has therefore supported the development of dual VET programmes, created new work-based learning opportunities, and introduced industry-recognised certifications. According to the project coordinator, a key attraction of the dual system promoted by 3LoE is that it allows learners to combine on-the-job experience with academic or theoretical learning, without having to choose exclusively between the two. In parallel, its train-the-trainer programmes have strengthened teaching methodologies, supporting continuous improvement across vocational education systems.

Training for entrepreneurship in the green economy is central to 3LoE and contributes to enhancing the attractiveness of VET. The *Latuaideadiimpresa*® (LTIDI) business game, implemented in partner VET schools, provides EQF level 4 students with entrepreneurial training, including creating business plans, presenting pitches, and receiving feedback from entrepreneurs and business associations⁴.

3LoE is aligned with EU priorities for vocational education and training, particularly:

- The European Skills Agenda and Osnabrück Declaration, which promote innovation, inclusion, and sustainability in VET.
- The Pact for Skills and Green Deal, supporting the upskilling and reskilling of the workforce for the green and digital transitions.
- EQF alignment (Levels 3–6) to ensure transparency and mobility across education systems and borders.

At the regional level, the CoVEs were embedded in the EU's Research and Innovation Strategies for Smart Specialisation (RIS3) framework that guided regions in identifying and investing in their competitive strengths.

⁴ 3LoE Overview of main activities and results of the project: <https://3-loe.eu/wp-content/uploads/Overview-of-main-activities-and-results-of-the-project.pdf>

1.4. Success factors

Added value of 3LoE

New dual training programmes related to green transition jobs were developed at EQF levels 3-6 which would not have been possible without 3LoE, according to the project coordinator. These programmes and their associated qualification profiles address existing skills shortages in the green economy.

The 3LoE consortium partners all recognise that cooperation with SMEs played a vital role in bridging the gap between education and business, enhancing the practical relevance of training programmes and ensuring that the skills developed aligned with labour market needs. This generated added value in several ways:

- **Stakeholder engagement:** SMEs were actively involved through business chambers and associations, facilitating intensive engagement. This helped identify business needs and tailor training programmes accordingly.
- **Applied research:** Students working in SMEs conducted applied research based on the companies' challenges. Findings were discussed with university professors and peers, resulting in tangible solutions that benefited the SMEs.
- **Entrepreneurship and innovation:** The project featured entrepreneurship training modules and green business idea competitions, encouraging innovative and entrepreneurial thinking among students—particularly relevant for SMEs that rely on innovation to stay competitive.

Collaboration with SMEs through the regional 3LoE CoVEs also contributed to the creation of sustainable networks centred on continuous cooperation, helping ensure that dual VET programmes remain aligned with evolving industry skills needs in the context of the green transition.

3LoE is reported to have brought about a significant shift in the mindset of VET school and university management and

“3LoE created something that did not exist before, serving as the missing link between the business community and the academic community. It bridged the gap between blue-collar and white-collar workers, especially in countries like Poland and Lithuania. While Germany and Austria had a stronger tradition in this area, there was still room for improvement.”

Project coordinator

teaching staff involved in the project, making them more open to cooperation with companies, particularly in countries where VET was traditionally school based rather than dual (e.g., Poland, Lithuania, and Latvia). This shift was crucial in fostering a collaborative environment in which academic institutions and industry partners could work together to enhance VET.

Although the 3LoE project was completed prior to the launch of the Union of Skills, it is well aligned with its principles, as explained by the project coordinator. It facilitates recruitment for SMEs by providing early access to skilled future employees. It strengthens the attraction and retention of talent by promoting a shift in VET, integrating classroom instruction with structured, work-based learning, enhancing learners' employability and supporting smoother transitions into the labour market. It also contributes to strong governance structures, with regional CoVEs operating under structured cooperation agreements and long-term business plans, including mechanisms for the exchange of best practices, both internally and across borders.

Potential for sustainability, scalability and transferability

3LoE supports the long-term sustainability of the established CoVEs and their international cooperation beyond Erasmus+ funding. A detailed dissemination strategy was put in place, involving continuous documentation of partner activities and the targeted transfer of results to 70 associated partners across 14 countries. As part of 3LoE, each CoVE developed policy recommendations with the aim of ensuring the sustainability of the CoVE initiative beyond the

project's funding period. Sustainability plans and business models for long-term continuation of each CoVE are presented in the following table⁵.

CoVE	Sustainability Plan	Business Model	Future Continuation
Austria	Integrated into national education and economy via Campus 02, Economic Chamber, and Development Institute.	Long-term agreements through Chamber system; support from sectoral associations and continuing education income.	Expanding partnerships and dual study programmes; ongoing SME training and R&D.
Germany – Dresden	Based in Energy Efficiency Centre, backed by Chamber of Crafts Dresden.	National/regional funding; revenue from training, consultation, and certification services.	Programme expansion; international cooperation (e.g. Hamburg); advisory role in dual VET adoption.
Germany – Hamburg	Legally institutionalised within State Vocational University of Hamburg.	Public funding via state law; income from dual Bachelor's tuition and training company contributions.	Launching new programmes (e.g. summer schools, degrees) from 2024 onwards.
Italy	Based on a north–south network of schools, agencies, chambers, and universities.	Public funding, chamber support, and paid CPD services; focus on green agriculture innovation.	Continuation of dual VET and Bachelor programmes; new inter-CoVE development projects in the pipeline.
Latvia	Coalition of vocational schools, Chamber of Crafts, ministries, and universities.	State and EU funding; income from training services and international partnerships.	New dual Bachelor's and CPD programmes; aligned with long-term political and funding strategies.
Lithuania	Local ecosystem including VET schools, chambers, and Panevėžys University of Applied Sciences.	National reform funding; chamber co-financing; monetised R&D and consulting.	Updated dual Bachelor's and SME upskilling offers; ongoing EU projects and mobility exchanges.
Poland	Led by Chamber of Crafts and vocational schools; considering legal registration.	Mixed model: training fees, chamber support, and local business development funding.	New dual technician and Bachelor's in "Green Supply Chain Logistics"; summer schools and expanded partnerships.
Spain	Supported by VET and HEIs with national authority backing.	National education funding; revenue from in-demand dual and short-cycle programmes.	Continuation of dual and CPD programmes; increased sectoral cooperation and EU-level dissemination.
Transnational / Consortium	Coordinates international CoVE collaboration.	Project grants, member fees, service contracts, and EU programmes (Erasmus+, Interreg).	Continued coordination, joint development, and institutional support across the network.

To facilitate transferability, the project develops adaptable concepts, models, and tools, transferring key elements of the German dual VET system to countries with predominantly school-based systems. This includes implementation strategies, trainer qualification standards, and curriculum development frameworks. Country-specific dual training curricula for specific occupations were designed and implemented in Poland, Lithuania, Latvia, and Spain⁶.

Each CoVE develops nationally adapted programmes and qualification profiles that address national skills needs, while also sharing practices and outcomes transnationally, ensuring both

⁵ Source: Results of partner evaluation of the establishment and long-term continuation of COVEs: <https://3-loe.eu/wp-content/uploads/Partner-evaluation-of-the-establishment-and-long-term-continuation-of-COVE.pdf>

⁶ Three-level centres of professional excellence "Green Economy for SMEs" and transnational platform: Part C Implementation, Evaluation & Business Models: <https://3-loe.eu/wp-content/uploads/Result-2.2-Three-level-centres-of-professional-excellence-Part-C-Results-COVE.pdf>

local relevance and European added value⁷. For example, the qualification profile for 'Technical Consultant for Energy Efficiency' was co-designed with sector experts in Austria to reflect national requirements, while integrating insights from an established training programme at the 3LoE CoVE in Dresden, Germany. The Italian partner adapted the Austrian qualification standard to create its own version, demonstrating how shared frameworks can be flexibly tailored to diverse regional contexts.

1.5. Overall impact and lessons learnt

The most significant achievement of the 3LoE CoVE project is its integration of green and digital skills into vocational education, ensuring alignment with evolving industry needs. By modernising curricula and fostering strong partnerships with SMEs and higher education institutions, the consortium partners deem that the project has fulfilled its aim of improving the quality and attractiveness of VET.

A major success lies in the strong collaboration established between the business community and educational stakeholders reported by the project coordinator. Although the CoVE operated for four years, this period allowed sufficient time for consortium partners to engage with SMEs, many of which are now

"Improving the employability of young people, increasing the attractiveness of VET, and strengthening companies' innovation through work-based learning, where students can connect academic and practical studying without needing to choose between the two, are 3LoE's key achievements."

Project coordinator

firmly embedded within the seven countries' ecosystems shaped by the 3LoE CoVEs.

In the long term, 3LoE CoVEs are expected to drive workforce development, particularly in the fields of renewable energy, digital transformation, and entrepreneurship. To secure financial sustainability beyond Erasmus+ funding, the project is actively exploring public-private partnerships, EU grants, corporate sponsorships, and revenue-generating training services.

⁷ Statement and examples provided by the Austrian and German consortium partners

2. AEDIL-dairy-CoVE – European Excellence in Dairy Learning

2.1. About AEDIL-dairy-CoVE

Background information

- **Project name:** AEDIL-dairy-CoVE – European Excellence in Dairy Learning
- **Call year:** 2021
- **Duration:** 2022-2026
- **Project status:** Ongoing

AEDIL is a CoVE project led and coordinated by FMF - Foreningen af Mejeriledere og Funktionærer, the Association of Dairy Managers and Employees in Denmark.

The project involves 41 partner organisations from 10 countries (Denmark, France, Germany, Greece, Ireland, Netherlands, Poland, Romania, Serbia and Türkiye), including VET schools, universities, private companies, sectoral organisations in the dairy industry and public authorities. Other countries are also involved in the project such as North Macedonia Cyprus, Finland and Norway which were included in the CoVE as associated partners after project approval. These are invited to annual General Assemblies and cluster meetings and are involved in some activities of the CoVE⁸.

Objectives of the CoVE project

The objectives of AEDIL are the following:

- Ensure that dairy VET is at the forefront of innovative pedagogy, research, sustainable and technological development
- Promote Lifelong Learning and Continuous Professional Development (CPD) among teachers and dairy professionals
- Create sustainable collaborative structures for synergy, cross-fertilisation and financial sustainability.

The CoVE is a follow-up of a previous project called 'Mapping Skills Needs & Supply in the Dairy Sector' which asked VET providers and companies to identify training gaps between training provision and skills needs in the labour market⁹. The mapping showed clear skill gaps at all the education levels in the dairy sector and the CoVE addresses the priority areas from the skills mapping project. This CoVE covers EQF levels 3 to 8, with a focus on EQF 3-5¹⁰.

Recruitment and retention of workers was another key finding of the skills mapping. This challenge is addressed in the project by establishing a process to support the attractiveness of the Dairy sector as a career choice, which include a recruitment campaign targeted the 12-16 years old. The material has been translated into 11 languages.

The AEDIL CoVE aligns with the European vision for VET excellence and has developed an Innovation Hubs in the dairy sector. For example, initiatives and steps have been taken at regional and national levels towards building business-education partnerships to tackle skills gaps and recruitment challenges. The models being developed by AEDIL's partners are intended to serve as inspiration and learning to foster strong partnerships among other partners in the consortium to create stronger transnational collaboration.¹¹

⁸ Interview – Project coordinator

⁹ [Les projets de l'Anfopeil – ANFOPEIL](#)

¹⁰ [About | European excellence in dairy learning](#)

¹¹ [About | European excellence in dairy learning](#)

2.2. Activities of AEDIL-dairy-CoVE and skills developed

Activities covered

The activities undertaken by the project partners include:

- **Cluster 1 – Teaching and Learning:** Project partners jointly elaborate courses available on the Dairy Learning and Innovation Hub. This also includes the organisation of a Dairy Academy, summer schools dedicated to dairy sector research, strengthening collaboration between VET, research institutions, and industry to ensure research addresses industry relevant topics.
- **Cluster 2 – Cooperation and Partnerships:** This involves teachers exchanges such as Danish teachers teaching 'dairy English' to VET-teachers in Germany and cocreation of digital dairy material between Ireland, Denmark and the Netherlands. All countries have carried out study visits both nationally (teachers doing WBL in industry), VET and university teachers collaboration on joint events and upskilling, as well as transnational visits were also carried out, for instance between France and Romania and the Danish CoVE went to Ireland to visit the university and some Irish farms. One of the goals for 2025 is to speed up teachers' mobility and study visits.¹²
- **Cluster 3 – Governance and funding:** This cluster involves activities related to administration and finance, quality assurance, evaluation and dissemination. This cluster also works on the sustainability plan for the project.

A South-East European cluster was established alongside these clusters including Türkiye, North Macedonia, Romania and Serbia which are not traditional dairy countries. The activities organised are not restricted to the members of the cluster and other countries can join as well.

Skills developed

The AEDIL CoVE focuses on delivering high-quality intervention addressing the priority areas from the skills mapping project, including technical dairy skills, digital skills and green skills.

- **Occupation-specific dairy skills:** The Danish CoVE has developed several courses, including automation for dairy, sustainability, plant-based production, food safety, food chemistry, hygienic design, production data, and a milk powder course, which will be made available online to all the AEDIL CoVE students by putting subtitles in English. In Germany, the skills covered in the project include ultrafiltration, which is a special way to separate particles of milk into minerals. The French CoVE has developed a course on milk chemistry. Romania has designed courses based on specific needs requested from the industry, and Türkiye has developed R&D-courses in close connection with the industry with a structured feedback loop that allows them to improve after courses are conducted.
- **Green skills for the dairy industry:** In light of criticism of the dairy sector as a significant CO2 emitter, the developed courses aim to lead in green technology and sustainable solutions, thereby ensuring food sustainability. New courses have been developed on topics such as sustainability and plant-based dairy.
- **Digital skills for the dairy industry:** The dairy industry ranges from traditional craftsmanship to fully automated plants, and therefore requires the development of a diverse range of skills. One of the flagships of the CoVE is to create digital twins between Siemens Germany, VET schools in Germany and VET schools in Denmark which will be used for teaching in Germany and Denmark. Two of these digital twins are ready in Germany and are used in dairy education: a heat exchanger and a separator while another one for a mozzarella cheese production line is under preparation. The CoVE project also uses 3D scans of dairy production lines. A workshop was carried out

¹² Interview – Project coordinator

for teachers on the use of ThingLink, an online learning tool which allows to create interactive pictures and videos, to present dairy equipment to students. A course is being developed on digital skills for dairy teachers and trainers which will be rolled out later this year. This course is a cocreation between Ireland, Denmark and the Netherlands. Another digital module is on its way and includes topics such as how to develop up-to-date learning materials, minimum standards to design a course with interactivity, course follow ups and feedback loops and the definition of learning outcomes. At the end of the courses, trainers have to provide digitally enhanced learning materials which should be shared on the Dairy Hub, a Learning Management System. The goal is to populate the Dairy Hub with next generation teaching materials for the benefit of other teachers and to build a community of practice of dairy teachers. In France, 'Serious Games' have been developed as a modular digital tool, designed through collaboration between industry and VET providers. This initiative aims to align training with labour market demands by enhancing the assessment and validation of industry-relevant skills.

Short, targeted fully online workshops are organised for the continuous development of dairy teachers on specific topics which should help them to develop updated content for learners. These workshops will be made available on the Dairy Hub. To support the development of teachers' competences, the project uses EU frameworks such as DigComp and GreenComp.

The Dairy Hub includes transnationally developed courses from Ireland, Denmark, Germany and France. The platform will be accessible for all teachers and professionals across the network. The nine first courses are being piloted and five collaborative courses will be developed on top of that. All the national CoVEs will have to provide at least one course which will be translated into all languages and made available on the Dairy Hub after a quality assessment. Several courses were developed at the national level in France, Denmark, Germany and Türkiye.

The project uses innovative pedagogies such as podcasting where students interview dairy teachers and people in the industry. Videos produced by dairy companies with voiceovers by teachers are used as pedagogical tools for courses. Role-playing has also been used in English courses for the dairy sector.

The AEDIL CoVE provides learning opportunities for research students and activities related to the dissemination of research in the dairy sector. For this purpose the Dairy Academy includes a summer school and an online symposium. The yearly free-of-charge summer school brings together around 20 PhD students, MSc students, and early career researchers for a week. The summer school offers lectures, workshops, and study visits as well as exposure to emerging topics such as dairy science and technology. The symposium held during the summer school week is fully online, opened to anyone interested and the lectures are recorded and made available on the Dairy Hub. Research students from the summer school are invited to present their work at the symposium, which has covered various dairy science and technology topics such as milk production, sustainability or dairy processing. The participation in the online symposium has increased remarkably over the years, reaching now around 400 participants.

The Turkish CoVE has organised a student congress on milk and dairy farming in May 2025 in Bursa, Türkiye. This brought together students, teachers and private sector representatives from different partner countries, mainly the South-East European cluster to share information on dairy issues such as production processes, green skills and digitalisation.

2.3. Results expected and achieved

Contribution to the development of qualifications

The EQF will be used as the level indicator for new training courses proposed on the Dairy Hub. The goal is to integrate the training courses developed by the CoVE in the curricula of the partner countries.

The AEDIL CoVE coordinators are currently working on providing micro-credentials for lifelong learning and digital badges after an assessment for the courses available on the Dairy Hub. The aim is to provide learners with small, accessible courses that can be recognised as prior learning for entry into more structured qualifications. These courses could be used for lifelong learning for people who finished their education, providing them with pathways into further education.

The Danish CoVE is working on a transnational programme for dairy teachers with Ireland which will be self-paced and available online, allowing an exchange of practices between teachers. This transnational programme is accredited and will provide recognition through the University of Cork.

At the national level, some of the courses developed by the Danish CoVE such as the milk powder course for students and industry, are accredited and provide ECTS points. Some of the courses developed by the Danish CoVE are integrated in the curricula of the VET school while others are electives. The Turkish CoVE has developed certificates for the courses they deliver in Türkiye with the support of the University College of Cork. The French CoVE developed a new cheese maker certificate which has been recognised at national level in France. .

Most CoVEs offer apprenticeship programmes, and those that do not are working to include them. For instance, Serbia has not had WBL in the dairy sector before, making it a key focus in the project.

Contribution to enhancing the quality and attractiveness of VET

An achievement of the project is to listen and incorporate industry needs into courses, thereby making students more skilled in the fields required by the industry. A previous project mapped the skills needs of dairy sector and identified two major areas of skills gaps on which the partner countries of the CoVE agreed: digital and green skills.

The Danish CoVE has developed courses in response to industry demands such as for milk powder production which was a demand coming from the industry. Similarly, France, Germany, Serbia, Ireland, Türkiye and Romania have designed many new courses in collaboration with industry professionals.

The dairy VET sector faces issues with the retention of teachers and trainers as their numbers decrease in Europe. The development of impactful learning and teaching materials helps with the attraction and retention of dairy professionals who can see that their learning materials are informed by what is happening internationally. The use of new technologies such as AI or digital twins has the potential to make the dairy industry more attractive and showcases the modern and less physically demanding nature of the work. This approach also aims to attract young individuals considering a career change, while highlighting the opportunities within the dairy industry. The CoVE demonstrated to VET students that they can continue their studies in dairy education at a higher education level.

The project has provided an opportunity to develop stronger collaborative linkages within the VET sector both nationally and internationally. The project has also brought together educators, learners, and industry representatives, fostering a more unified approach to addressing skills gaps.

2.4. Success factors

Added value AEDIL

Through this project, project participants have realised the added value of European cooperation regarding dairy education. For example, according to the German project coordinator, the project has helped German dairy companies to understand the importance of collaborating on a European level rather than just focusing on the national level fostering for

example the use of English in dairy training in Germany¹³. For this purpose an exchange of teacher training in dairy English was conducted in Spring 2025, provided by Danish teachers to German teachers. At the transnational level, countries learn from each other teaching practices while at the national level, VET schools, universities and companies exchange knowledge and practices.

The exchange between the dairy schools and the business community has intensified helping to break down barriers between companies and the VET sector. In Germany, more and more companies are willing to participate in further education and training in dairy as they realise that the future competitiveness of the dairy industry depends to a large extent on the qualifications of employees and their continuous training. The French VET school is developing an assessment tool to evaluate the level of knowledge of dairy companies' employees in collaboration with the industry. According to the project coordinator, Serbia and Romania have shown success in integrating new companies into the CoVE in contexts where, traditionally, educational institutions and private companies do not work together¹⁴.

The project has improved dairy students' and teachers' competencies making them more attractive to business and industry especially regarding STEM skills¹⁵. Students benefit from new courses and improved teaching methods while teachers benefit from international exchanges by being exposed to different teaching methods and dairy areas and the opportunity to learn about modern dairy practices. The CoVE project has provided a springboard for implementing digital skills and innovative teaching methods among dairy education in Europe. The Dairy Academy summer schools and symposium play a pivotal role in fostering the knowledge triangle (research, education and industry) in the dairy sector. The Dairy Academy brings together stakeholders from the dairy industry, dairy researchers and dairy teachers to collaborate, learn from each other and share best practices. The summer school involves guest lecturers who are both from universities and companies. The research spread during these summer schools is also relevant for many other industries. These summer schools and the symposium have strengthened the relations between, on the one hand, teachers and trainers and, on the other hand, employers. They also support the transfer of knowledge from universities to VET teachers regarding dairy industry issues in order to transform the VET level. To develop some of the courses which were on very new topics and on which no teaching materials were yet available, Danish teachers consulted the industry or spoke to researchers.

The collaboration between France and Germany which have similar dairy education systems with occupations at the same EQFs levels has improved. The German CoVE provided the opportunity to share their VET model in dairy learning which involves the exchange of teachers with industry and laboratory education while French teachers brought, for instance, their specialisation in hard cheese production. Similarly, the cooperation between the Danish VET school and the Irish university has been very fruitful in building links that did not exist before. The CoVE has provided an opportunity for the Irish university to work with vocational schools in France and Denmark on the development of new courses.

The consortium includes partners from enlargement countries and third-party countries with the ambition to grow their dairy sectors. Some countries in the CoVE have a long tradition in dairy VET such as France and Germany while other countries such as Romania and Serbia had to develop their dairy VET programmes from scratch highlighting the variety of maturity between CoVEs in different countries. Different country clusters have been established such as the South-East European cluster while the French and German partners focus together on the use of the French e-learning platform Webalim. As the CoVE includes 45 partners, the work in such sub-groups is reported to be more efficient.

¹³ Interview – Project partner (sectoral organisation in Germany)

¹⁴ Interview – Project coordinator

¹⁵ Interview – Project coordinator

Potential for sustainability, scalability and transferability

The Dairy Hub will help to ensure the sustainability of the project results by being integrated into the AEDIL network. The CoVE partners are members of the AEDIL network, an association established in 1992 for VET in the dairy sector, which helps to maintain the sustainability of the project as there is already a strong culture of collaboration. To ensure the long-term sustainability of the project, the platform should be actively maintained with partners committing to continuous provision of materials and inputs. Moreover, the partners are encouraged to make full use of the Hub's functionalities – such as the Forum – to facilitate dialogue on shared topics of interest and to support the exchange of knowledge and research outcomes.

A business model is currently being determined for the Dairy Hub which should differ depending on the category of stakeholder concerned, with a smaller membership fee for teachers to access the platform and a higher fee for companies.

All the national CoVEs were asked to come up with a model for actions to ensure that the CoVE is sustainable, taking into account that a one-size-fits-all approach is not possible. In Denmark, sustainability is ensured as the courses are already developed and taught by teachers. In Germany, courses provided by the CoVE project are not free of charge even if the development of the courses was funded by the CoVE; but the price of courses is accepted by the German dairy industry as these courses have been designed in collaboration with the industry.

The project partners are looking at future funding opportunities through the EU such as Erasmus+ to maintain the network post-project. The short, targeted fully online workshops focused on a particular topic for teachers look especially effective and easily replicable according to the Irish project coordinator. Now that partners have the network, a programme can relatively quickly be put together with experts from industry and teaching and research institutions to deliver a course to teachers.¹⁶

Regarding the transferability of the project, the digital twins could be adopted by other organisations in the network and outside of the network when up and running. Once operational, the digital twins will enable students to engage with real-case scenarios, allowing them to practice troubleshooting in a safe environment without disrupting actual production lines, damaging equipment, or interfering with ongoing processes. The innovative teaching methods and digital tools developed by the CoVE can be applied across different fields as well as the training for teachers on the use of innovative pedagogies. The ambition is that other partners will be able to access the learning materials available through the Dairy Hub.

2.5. Overall impact and lessons learnt

The activities of the CoVE are aligned with the requirements of the future of the dairy industry especially regarding sustainability as well as the need for investment in sciences and technologies. To build the capacity of European dairy VET is especially important as many transnational mergers in the sector are happening in Europe.

The CoVE project faces some challenges such as differences in dairy training systems which are at different EQF levels depending on the country. Companies are also not always very keen to share their knowledge on some topics as this could be considered to be commercially sensitive, but the project provided the opportunity to exchange knowledge which is quite rare in the dairy sector.

One of CoVE's greatest achievements, according to the interviewees, has been the development of a community of practitioners, bringing together professionals from different sectors and creating an atmosphere of knowledge sharing^{17,18}. The project has helped to break

¹⁶ Interview – Project partner (university in Ireland)

¹⁷ Interview – Project partner (university in Ireland)

¹⁸ Interview – Project partner (university in Türkiye)

down invisible walls between countries and institutions, according to the interviewees creating greater awareness of the capabilities available in the dairy VET sector across Europe. Another sign of the success of the project is the involvement of other EU and non-EU countries that were not originally part of the CoVE.

The project contributes to the development of highly engaging, and impactful learning materials for dairy professionals on emerging topics using new pedagogical tools such as the digital twins or the 3D scans of production lines that will live beyond the project. A community of practice of dairy teachers and trainers at different levels of education within and across countries was also created through the Dairy Hub and the Dairy Academy, connecting higher education to VET. For example, the research symposium to which VET teachers are invited had only 30-40 participants when it started but the last one had some 300 online participants.

Key to the success of the project were two factors. First, the organisation of the CoVE around the AEDIL network, which has been operating for 30 years, was crucial as all partners are members of the network. Secondly, the involvement of companies that are leaders in the dairy sector in Europe was also very important.

3. AGRIFOOD4FUTURE – Centres of Vocational Excellence in Smart Farming and Sustainable Food Systems

3.1. About AGRIFOOD4FUTURE

Background information

- **Project name:** AGRIFOOD4FUTURE – Centres of Vocational Excellence in Smart Farming and Sustainable Food Systems
- **Duration:** 2023-2027
- **Call year:** 2022
- **Project status:** Ongoing

AGRIFOOD4FUTURE (AF4F) is a Centre of Vocational Excellence project led and coordinated by the Università Cattolica del Sacro Cuore, Italy. The project involves 23 partners across six countries (Belgium, France, Greece, Italy, Portugal and Spain), including VET schools, non-profit organisations, private companies and higher education institutions.

Objectives of the CoVE project

The AF4F CoVE project aims at building VET skills and educational programmes addressing the needs of the “agriculture of the future”. It aims to innovate in the VET ecosystem in agri-food by establishing a network of CoVEs active in six European countries (i.e., Italy, Spain, France, Portugal, Greece, and Belgium). This initiative seeks to align with the urgent need for the agriculture sector's digitalization, decarbonization, and sustainability, intending to break down existing barriers and foster innovative agricultural practices.

The AF4F reportedly aligns with the Green Deal, European Digital Agenda, and Farm-to-Fork Strategy to promote sustainable and innovative agricultural practices and it is in line with the objectives, priorities and actions of the European Skills Agenda, in particular the EU Skills Partnership for Agri-Food Ecosystem. The definition of common quality criteria in educational curricula, the definition of learning outcomes according to the levels of the EQF and the certification of titles is expected to address and contribute to implementing EU frameworks such as **EQAVET**, **EQF** and the European approach to **micro-credentials**.

The AF4F seeks to align educational frameworks with the rapidly evolving demands of its diverse stakeholders, focusing on four pillars: Digital Transition for enhanced productivity, Green Transition for energy-efficient agriculture, Resilience in food systems, and Business Sustainability through innovative models and resource valorisation.

The main operational objectives of the AF4F are to:

- Contribute to the transformation of the agri-food sector towards digitalisation, decarbonisation and sustainability.
- Support the large-scale implementation of new and emerging agriculture practices, such as climate-smart agriculture, precision agriculture, regenerative and organic practices.
- Provide the necessary soft and technical skills, raising awareness, and cultivating an entrepreneurial mind-set for the “agriculture of the future” for young people and workers in the agri-food sector.

3.2. Activities of AGRIFOOD4FUTURE and skills developed

Activities covered

Stakeholders emphasised the collaborative approach of the project in the delivery of activities. Consortium members noted that the collaboration between different partners, including universities, industry, and training providers, allows for a comprehensive approach to addressing gaps in the agricultural sector. Each partner brings unique expertise and perspectives, enhancing the overall effectiveness of the programmes. Additionally, the combination of various activities, such as start-up acceleration programmes, test farms, and co-creation workshops, creates a pipeline that allows participants to grow and develop.

The activities undertaken by the project partners include:

Cluster 1: Teaching and learning, with a focus on the design and implementation of innovative VET programmes for professionals in agri-food, also exploiting digital tools and work-based approaches. This includes the design of a training programme for technicians in smart farming and environmental sustainability in the food system (EQF level 3-5); development of a transnational joint semester exchange (EQF level 6-7), and Master and PhD training courses (EQF level 8-9); design of a farmers advisors training programme (lifelong learning level) and the development a capacity building and technical assistance programme for agrifood SMEs and farmers.

Cluster 2: Cooperation and partnership, with a focus on the interaction between the local CoVEs, establishment of business-education partnerships, internationalization of the VET ecosystems and support to open innovation and entrepreneurship in the field. Activities in this cluster include the establishment of a network of light house farms¹⁹ on regenerative farming practices as an instrument for peer-to-peer learning and internships; application and practical demonstration of smart farming tools, including living labs, demo days and CoVE site/farm visits; the development of an open innovation test farm programme for startups, farmers, and VET students and the design and delivery of an international summer school on soil health. For instance, as part of the innovation test farm programme, the project connects early-stage startups and research groups with mature companies to address specific challenges. For instance, a honey company is collaborating with startups and research groups to develop innovative packaging solutions that can store honey for longer periods. This direct matchmaking is expected to accelerate the innovation process.

Cluster 3: Governance and funding, with a focus on support to investment and fund-raising strategies, as well as the establishment of effective governance at all levels. It includes the design and implementation of an Agrifood Government & VET Academy towards the improvement of the VET and innovation ecosystem in the agro-food sector.

The project is designed to maximise synergies between activities. For example, a start-up in the acceleration programme – currently at Technology Readiness Level (TRL) 5 and looking to further test its product – was connected with another component of the programme designed to support product testing. Through this support, this solution will be piloted in a scientific setting. This highlights how the CoVE serves as a hub, connecting entrepreneurs with opportunities and offering a comprehensive support system.

¹⁹ This is inspired in the proven concept of lighthouse farms, developed within the Lighthouse farm project (<https://www.lighthousefarmnetwork.com/>). In this project, lighthouse farms are being defined as: “existing, commercially viable farm in the real world that are positive deviants and are “already in 2050” in terms of providing sustainably produced food and ecosystem services. These farms demonstrate what can be achieved within the bio-physical and socio-economic solution spaces”. Thus, lighthouse farms are exemplary farms, demonstrating specific aspects of sustainable production, serving as real-life experimental farms and “living laboratories” able to advance our “scientific understanding of the principles and practices of sustainable production”

Skills developed

To support the design of its curricula, the AF4F project conducted a survey aimed at identifying the specific skill needs within the agrifood sector. The results are being used to ensure that learners gain not only technical knowledge aligned with current agricultural practices but also transversal competencies and soft skills that enhance employability and adaptability.

The project integrates several EU skills frameworks to develop educational materials, including EQAVET, EQF, and the new European approach to micro-credentials. The ESCO framework is used for defining courses at EQF levels 3-5 and for lifelong learning. Additionally, the project leverages DigComp and GreenComp frameworks to embed digital and sustainability skills into the curriculum.

The survey revealed several **occupation-specific** skill gaps, particularly in areas such as farm planning and resource optimisation, managing field operations through digital technologies, deploying robotic solutions in agriculture, and adopting regenerative carbon farming practices. These job-specific skills have been framed to incorporate both **digital and green aspects**, reflecting the growing importance of sustainability and innovation in the sector. In response to the digitalisation needs identified, the curriculum includes dedicated units on data analytics for precision farming, the use of Internet-of-Things technologies in agri-food production, and e-commerce applications for agribusinesses. On the environmental side, training modules have been developed to address climate risk assessment and adaptation strategies in agriculture, directly targeting gaps identified in the survey.

The survey also highlighted a demand for stronger **transversal and soft skills**. Participants noted challenges with practical data analysis, especially using tools like Excel, as well as a need for competencies in digital entrepreneurship. These topics are now being tackled jointly by VET providers and higher education institutions through co-developed learning materials.

The CoVE adopts a **blended learning approach** that combines in-person sessions, online learning, and hands-on field activities. AGENSO, a consortium partner, contributes significant expertise in the digitalisation of the agrifood sector, bringing in digital tools developed under other EU-funded projects.

Innovative pedagogies are central to the CoVE project's approach, with a strong emphasis on co-creation and collaboration. For example, co-creation workshops are planned where farmers, students, and other stakeholders will come together to discuss key issues such as climate change, policy, and farming challenges. Insights from these sessions will directly inform the development of new e-learning tools tailored to real-world needs.

A dedicated "Train the Trainers" programme focuses on equipping VET teachers with entrepreneurial teaching skills, with specific guidance on how to embed entrepreneurship at different educational levels. Teachers and trainers will also benefit from international teaching mobility schemes and participate in an online forum hosted on the e-learning platform, where they can exchange experiences and discuss soft skills modules that support entrepreneurial development. To ensure knowledge transfer, peer-to-peer training sessions will be organised within each CoVE, where VET educators train fellow teachers. Higher education faculty will also be invited to participate, fostering cross-level collaboration. One of the challenges faced is the lack of budget for mentor remuneration. To address this, consortium partners are reaching out to their own networks.

The AF4F is implementing several innovation and entrepreneurship programmes, each facing distinct challenges, according to the partners consulted. The Acceleration and Entrepreneurship Programme suffers from a lack of prize funding and competition which hinders its attractiveness. Regardless, the program goals were reached according to the coordinator. The Open Innovation Challenge Programme, which connects companies and startups, is hindered by low company engagement, startup scouting difficulties, and IP-related barriers. Meanwhile, the Open Innovation Testing Programme, where startups test innovations at CoVEs, shows promise

but struggles with uneven implementation across countries – with France's DIGIFERMES²⁰ standing out as a successful model that is difficult to replicate elsewhere due to lack of resources. According to partners, one of the main challenges in replicating the DIGIFERME® model lies in adapting the system to local contexts while preserving core principles: methodological rigor, stakeholder involvement, and institutional coordination. However, the successful adaptation of the model within AF4F, through the creation of DIGICUMA with CUMA Ouest²¹, demonstrates that replication is feasible when strong local partners are involved, particularly those with proven expertise in evaluating innovation, the operational capacity to lead such initiatives, and sufficient financial resources to access and sustain the required infrastructure.

3.3. Results expected and achieved

Contribution to the development of qualifications

The project does not plan to develop new formal qualification. The project developed various VET courses which will be rolled out in September 2025 either online (reaching a broader audience) or nationally in line with rules and practices of the national VET schools involved. These courses will either be integrated into existing longer programmes or offered as standalone modules, with participants receiving a certificate of attendance.

In addition, the CoVE is working on the development of micro-credentials (in line with the [2022 EU Council Recommendation](#)) within its lifelong learning programme, specifically targeting capacity-building for farmers and advisors.

The project also includes the creation of six VET career observatories, aimed at monitoring the trends of the labour market, adapting the learning programmes accordingly and supporting career development in the agrifood sector. As part of the observatories (currently under development), the project coordinator explained that there will need to be discussions on how policy can support training and VET career in the agrifood sector, including recognition of qualifications. While dialogues with national and regional policymakers have started, these are still in the early stages, and there are no substantial outcomes to report yet.

Contribution to enhancing the quality and attractiveness of VET

While it is early to identify tangible results yet, several actions are foreseen to enhance the quality and attractiveness of VET. Consulted partners reported that preliminary activities (namely, the Report on the job and training needs analysis and Handbook with Best Practices in the VET and Higher Education Ecosystems in the Agrifood Sector) have helped define the main skill gaps, information that can be used to design training materials.

The project has focused on developing curricula and learning content based on the needs of the market, which is crucial for creating a greater impact at local, regional, and national levels. This approach helps to ensure that the training provided is relevant and up to date with industry requirements.

²⁰ DIGIFERME® is a structured French network of experimental farms led by research, development, and innovation organizations. Its core mission is to offer agtech companies and innovators a robust, field-based framework for testing and objectively evaluating digital technologies under real-world farming conditions. Today, the network includes 21 certified Digifermes, each specialized in different agricultural sectors (arable crops, livestock, viticulture, etc.), reflecting a diversity of contexts and expertise across French agriculture.

²¹ The Open Innovation Test Farm component of AF4F builds on the DIGIFERME® model to establish a European network of test farms. In France, this was facilitated by the partnership with CUMA Ouest, a cooperative structure that already fosters resource sharing and collective innovation among farmers. Thanks to this collaboration, CUMA Ouest launched the DIGICUMA label, inspired by DIGIFERME®, to recognize CUMAs testing digital tools in real conditions and contributing feedback to solution providers. Five innovations are currently being tested in the DIGICUMAs under this initiative

Additionally, interviewees report that the CoVE project has strengthened collaborations with higher education and VET providers, leading to the development of high-quality training materials. Universities have played a central role in co-developing training programmes across all qualification levels, including a joint semester exchange, technician training in smart farming, and lifelong learning for farmers and advisors. They've also contributed to peer-reviewing educational content and co-teaching modules alongside VET providers, ensuring academic quality and relevance.

This collaboration has fostered knowledge exchange between higher education institutions and VET providers, enriching teaching practices and integrating research into applied learning. Institutions like Università Cattolica del Sacro Cuore and Arvalis have supported internships and field visits, giving students practical exposure to agri-tech environments. According to stakeholders consulted, the collaboration has been mutually beneficial: higher education institutions bring academic structure and research depth, while VET providers and SMEs offer practical insights and access to professionals who might not typically engage with academia. This collaboration helps to close the gap between education and industry, ensuring that the skills taught are aligned with market needs.

Moreover, the project has facilitated the upskilling of teachers and trainers through the use of innovative pedagogical methodologies and digital tools. This not only improves the quality of teaching but also makes VET more attractive to students by incorporating modern and engaging learning methods, according to the stakeholders consulted.

Furthermore, the CoVE project has created a network of international internships, providing students with opportunities to gain practical experience and improve their employability. This hands-on experience is highly valued by both students and employers, making VET a more attractive option for learners, according to VET providers partners. While this is targeting more higher education students, efforts to include more VET students are also being undertaken.

The development of VET observatories will support the implementation of local strategies for VET attractiveness, but this is still work in progress. Efforts to engage policy makers are also ongoing and will take place throughout the entire project to influence national and regional policy agendas.

3.4. Success factors

Added value of AGRIFOOD4FUTURE

Stakeholders consulted reported significant added value to the participating organizations, students, teachers, and companies involved.

For the **participating organisations**, the CoVE project has facilitated transnational cooperation, providing opportunities for future collaboration and access to extensive networks. The exchange of expertise among the consortium's diverse stakeholders has proven invaluable, as it has enabled meaningful knowledge sharing and collaboration across varied professional profiles. Linked to this, participating organisations highlighted the benefit of the international dimension of the project. They explained that the exchange of practices particularly with countries with more advanced VET systems is highly valuable. VET providers have benefited from the development of innovative materials, raising their profile within the regional and national educational ecosystem. This positioning as key players in VET has the potential to attract more students and partners to their initiatives, according to interviewees.

Students will gain access to free innovative pedagogic materials, aimed at increasing their employability and competitiveness. They will acquire relevant skills related to digitalization, sustainability, and precision farming, enhancing their mobility across Europe and access to state-of-the-art practices showcased in the project. The project also offers mobility opportunities and access to internationalization schemes, which are highly valued by students.

For **companies**, the CoVE project provides access to a pool of graduates with the skills needed to meet the demands of the agri-food system. Companies will benefit by helping to shape curricula that reflect real market needs, ensuring that the EU workforce is equipped with the skills required for the future.

Teachers and trainers will be upskilled through the use of innovative pedagogical methodologies and training based on digital tools and platforms. In-company trainers will gain access to relevant skills and a wide network of companies, enhancing their opportunities for collaboration and knowledge exchange.

Overall, the CoVE project is expected to significantly enhance the quality and attractiveness of VET by aligning training with market needs, fostering collaboration between education and industry, and providing practical learning opportunities for students. This holistic approach will ensure that all stakeholders benefit from the project's initiatives, which creates a dynamic and engaging learning environment according to interviewees.

Potential for sustainability, scalability and transferability

The transnational CoVE established through the AF4F project has integrated a variety of strategies to ensure **financial sustainability** beyond the project's funding period. Despite existing budgetary challenges, a dedicated **working group on sustainability** has been established within the project to focus specifically on long-term viability. Stakeholders have also emphasised the importance of **leveraging transnational initiatives**, such as the CoVE Community of Practice (CoP) and the Pact for Skills, to help identify new funding opportunities and facilitate knowledge exchange.

Regarding the national CoVEs the **engagement with national stakeholders**, including institutions responsible for training and employment, is expected to contribute to sustainability. These partnerships are being explored to identify alternative and long-term funding sources. In parallel, continuous efforts are being made throughout the project to raise awareness among policymakers and relevant stakeholders, promoting the CoVE model and its value.

Discussions around the **potential monetisation** of training services have also taken place. While some stakeholders suggest that charging for training could help reinforce its perceived value and contribute to sustainability, others argue that financial viability depends more on structural solutions than on end-user fees alone.

The **further involvement of industry actors and farmer associations** has been highlighted as a critical success factor. Their engagement can not only ensure financial backing but also enhance the relevance, visibility, and uptake of CoVE activities within the sector. Building strong partnerships with these stakeholders will be essential to secure post-Erasmus+ support.

Finally, regarding **replicability and scalability**, stakeholders agree that the wide scope of the agrifood sector and the practical, adaptable methodologies developed within the project will facilitate the transfer of results across regions and contexts, ensuring a lasting impact.

3.5. Overall impact and lessons learnt

The AF4F project aims to establish a unified and innovative framework for vocational excellence in the agrifood sector across multiple countries. By aligning skills development and training with the real needs of the sector, it aims to ensure that learners acquire relevant, future-oriented competencies – particularly in smart farming and sustainable agrifood systems.

A core strength of AF4F lies in its **collaborative and complementary approach**. Strong partnerships within the consortium, not only strengthen the project's implementation but also provide a basis for the sustainability and scalability of its results. These synergies are designed to extend beyond the life of the project, with the intention of enabling partners to continue developing and applying AF4F outputs in future initiatives and other contexts. Additionally, stakeholders highlighted the benefits of the collaboration between VET providers and higher

education institutions, as explained above. Working closely with industry representatives also helps design modules in line with market needs.

Crucially, AF4F promotes the better exploitation of results individually acquired through other EU-funded projects. Rather than duplicating efforts, it capitalises on existing knowledge and tools, integrating them into a coherent framework that enhances their value and impact. For instance, one of the partners explained that digital tools (i.e., online platforms and decision support systems) developed under H2020 projects²² were showcased to a wide range of "knowledge receivers" such as farmers and farming SME. Although AF4F is not a research and innovation action (RIA), its ability to interconnect diverse experiences and outputs from various EU initiatives represents a strategic move to maximise the return on public investment and contribute to broader systemic change, according to stakeholders consulted. This interconnection of actors and knowledge is essential to fostering vocational excellence across the agrifood value chain.

AF4F is aimed at the creation of vocational excellence in the field of smart farming and agrifood systems – a key area for food security, innovation, and green transition. AF4F is a state-of-the-art initiative, distinguished by its integrated, cross-border, and practice-driven approach, with no comparable precedents in the sector.

²² In particular The **online platforms** [Smart Protect - Home](#), [Agro Fossil Free - Home](#), [INNOSETA – INNOVATIVE SPRAYING EQUIPMENT TRAINING ADVISING](#) were presented/demonstrated/showcased to participants in the **Technical assistance program for farmers and agro SMEs on digitalization** (AF4F Tasks 4.4). The **DSSs** [OPTIMA DSS](#), [Novaterra DSS](#), [OchraVine DSS](#), <https://www.effispray.com/> were presented/demonstrated/showcased to participants in the **Capacity building program for farmers and agro SMEs** (also under AF4F Tasks 4.4)

4. AI4VET4AI – AI-powered Next Generation of VET

4.1. About AI4VET4AI

Background information

- **Project name:** AI4VET4AI
- **Duration:** 2023-2027
- **Project call year:** 2022
- **Project status:** Ongoing

Launched in June 2023 with an end date in June 2027, the AI4VET4AI initiative – “AI-powered Next Generation of VET” – is a Europe-wide Erasmus+ Centre of Vocational Excellence (CoVE) coordinated by Algebra University College in Croatia.

With 26 partners from 11 countries (Austria, Croatia, Germany, Greece, Ireland, Italy, the Netherlands, Serbia, Slovenia, Spain and Türkiye), the consortium includes a wide range of actors: higher education institutions, VET providers, research organisations, civil society groups, companies, and public bodies, such as Inercia Digital (Spain), Solvership (Croatia), The Management Center Innsbruck (MCI)(Austria), AlterContacts (the Netherlands) and FIŠ - The Faculty of Information Studies in Novo Mesto (Slovenia). Although the project is at its midpoint, it has already delivered notable results in its development of MOOCs, awareness raising campaigns and gap analysis to map the VET industry in Europe (what is available versus what is needed) and continues to advance.

The project's core mission is to accelerate the digital transformation of vocational education and training (VET) systems across Europe by embedding artificial intelligence (AI) into curricula, teaching practices, and institutional strategies. The project also engages with regional priorities in 18 NUTS2 regions²³, in ways that broadly reflect the principles of Smart Specialisation Strategies (S3), and aims to address workforce needs in sectors like healthcare, logistics, tourism, education, insurance, and marketing.

Objectives of the CoVE project

The AI4VET4AI CoVE aims to accelerate the digital transformation of vocational education and training (VET) systems across Europe by embedding artificial intelligence (AI) into VET curricula, teaching methods, and institutional strategies. Its overarching objective is to build the AI competencies of both learners and educators, particularly in non-ICT sectors such as healthcare, tourism, logistics, and manufacturing. This ambition directly supports the Erasmus+ programme's priority of fostering innovation in education and training, and contributes to the broader EU vision of a resilient, digital, and green economy. The CoVE is structured around specific objectives that exemplify the concept of vocational excellence: promoting multi-stakeholder cooperation, boosting the relevance and quality of VET, and developing flexible learning pathways through micro-credentials and modular curricula. These goals closely align with the European Skills Agenda, the Digital Education Action Plan (2021–2027), and frameworks such as DigComp, GreenComp, and ESCO. AI4VET4AI also supports the Union of Skills initiative²⁴ by ensuring that the tools and content produced are accessible, transferable, and anchored in real labour market needs.

By advancing transnational collaboration, shared learning among partners, flexible and adaptive learning courses, and systemic innovation, AI4VET4AI contributes to the strategic priorities of Erasmus+, including digital readiness, inclusion, and institutional capacity-building. It positions

²³ [Overview - NUTS - Nomenclature of territorial units for statistics - Eurostat](#)

²⁴ [Union of skills - European Commission](#)

vocational education as a driver of technological adaptation and social cohesion, in line with the EU's twin digital and green transitions.

It should be noted that as of May 2025, the AI4VET4AI project is at its halfway point, with many activities actively underway and key deliverables in development. While the project has shown promising progress – particularly in curriculum co-creation, awareness raising, and stakeholder engagement which will be presented in this case study – it is important to highlight that many of the expected outputs and impacts are still in progress. At this stage, there is limited hard evidence available regarding long-term outcomes or systemic changes. The case study therefore presents preliminary insights and findings, which can be subject to further validation and refinement as the project advances toward completion in 2027.

4.2. Stakeholders involved and activities covered

Roles of the CoVE coordinator and partners

Algebra University coordinates the AI4VET4AI project, facilitating collaboration across partner institutions and drawing on its experience in delivering both VET and higher education programmes aligned with European Qualification Framework (EQF) levels 5 to 7. The consortium's diversity—both geographically and institutionally—has fostered mutual learning and capacity building. According to partners such as FIŠ and Solvership, the project has enabled smaller or newer institutions to benefit from the expertise of more experienced organisations, helping them expand their AI-related training and teaching capacities

The ten Work Packages (WPs) are distributed across partners, with specific institutions taking leadership roles. For instance, Algebra University leads AI curriculum design (WP4), FIŠ guides strategic planning for VET institutions (WP9), and Inercia Digital co-develops content and leads outreach efforts (notably WP3). MCI in Austria plays a central role in MOOC and curriculum development (WP5), drawing on its dual identity as a university and research centre. Solvership contributes to WP4 by developing sector-specific training content and modules for both learners and teachers, particularly focused on practical application and ethical AI. Finally, Civil society organisation AlterContacts enhances stakeholder engagement by bridging policy, education, and real-world application.

Activities covered

The activities are structured around three pillars:

- **Teaching and Learning:** Creation of AI-focused curricula, MOOCs, teacher training resources, and real-world learning scenarios. Initiatives include AI campuses, innovation hubs, and learning factories.
- **Partnerships and Collaboration:** Monthly plenaries, working groups, and thematic discussions facilitate joint development, local engagement, and knowledge exchange. Cross-national mentoring supports capacity building.
- **Governance and Sustainability:** Effective coordination (WP1) ensures smooth delivery, while sustainability measures (WP9) aim to embed results institutionally and secure long-term funding beyond Erasmus+.

Wider engagement in CoVE activities

The AI4VET4AI project has made progress in establishing and expanding Centres of Vocational Excellence (CoVEs) across local, regional, national, and transnational levels. The AI4VET4AI project has been developing Centres of Vocational Excellence (CoVEs) as dynamic ecosystems connecting actors at local, regional, national, and transnational levels. With active participation from 26 partners across 11 countries, the CoVE integrates educational providers, civil society, public authorities, and industry actors. Interviewed partners, including MCI (Austria), AlterContacts (Netherlands), and FIŠ (Slovenia), highlighted structured collaboration, strong internal coordination, regular cross-country meetings, and shared thematic work packages as

key enablers for joint development. These mechanisms have supported the co-creation of scalable curricula, digital platforms, and training content that align with EU frameworks such as DigComp, ESCO, and GreenComp. According to MCI and FIŠ important drivers of success have included:

- High partner motivation and professionalism in managing a large, complex partnership;
- Synergy between academic institutions and vocational providers;
- The immediate relevance of AI to labour market needs, particularly in non-ICT sectors such as healthcare and tourism.

Higher education institutions (HEIs), particularly MCI and FIŠ, play a pivotal role in the project by bridging VET and academic ecosystems. This has included contributing to curriculum design, pedagogical innovation, and teacher training. Their expertise is ensuring AI-related content meets both academic quality standards and vocational relevance. This collaboration between HEIs and VET providers enhances knowledge transfer, supports micro-credential development, and ensures that training content is both research-informed and labour market-needs. As noted by FIŠ, their strategy includes regional outreach and close alignment with evolving ICT trends.

Engagement with external stakeholders – such as employers, social partners, policymakers, and non-consortium experts – is embedded in the project's design. Partners like AlterContacts and Inercia Digital described extensive awareness-raising events and dialogue sessions, including events tailored to university professors, female entrepreneurs, and public policy students. These initiatives have generated strong interest in AI's role in education and business and provided valuable input into curriculum development.

Use cases and forthcoming AI incubators (currently under development) are intended to serve as applied co-creation spaces. However, as several partners noted, these are still in progress and their full impact is yet to be assessed. One of the standout success factors, according to MCI, has been the alignment of institutional strengths with real-world skills needs, especially in adapting educational content quickly in response to rapid developments like ChatGPT and other generative AI tools. However, all interviewees acknowledged the challenges posed by AI's fast-paced evolution – necessitating frequent updates to training materials, cross-border alignment of standards, and continuous stakeholder engagement. While promising structures are in place, partners – including Solvership and Inercia Digital—noted that sustaining this ecosystem beyond Erasmus+ funding will require embedding project outcomes into national education strategies and ensuring continued investment from public and private stakeholders.

4.3. Results expected and achieved

Contribution to the development of qualifications

At the midpoint of the AI4VET4AI project, progress has been made in the development of qualifications, though several key outcomes are still underway or in preparatory stages. Expected results outlined in the proposal included the creation of new curricula for AI-related skills in non-IT sectors, the integration of these materials into VET and CVET systems, the development of micro-credentials aligned with EU frameworks (e.g. ECVET, EQF), and transnationally co-developed modules with the potential for formal recognition across countries.

Achievements to date include the following. Partners have co-designed over ten thematic curricula and are finalising course content under Work Package 4, covering application domains such as healthcare, tourism, logistics, and sustainability. These curricula have been aligned with skill frameworks such as DigComp and GreenComp and are being modularised with learning outcomes in mind to support future accreditation and the development of stackable micro-credentials.

One example, cited by Solvership, is the development of course content designed to teach both learners and teachers how to apply AI tools in practical settings. This includes curricula on how to integrate AI in teaching workflows and sector-specific applications such as logistics and

sustainable tourism. This interviewee also noted the parallel development of curricula for learners and trainers, ensuring that teachers are equipped to instruct using AI-informed pedagogies. Although formal integration into National Qualification Frameworks (NQFs) has not yet been completed, there is strong alignment with qualification standards and a clear pathway toward formal recognition. Efforts have also focused on supporting VET providers with the institutional capacity to deliver micro-credentials, and to embed work-based learning via AI VET campuses and incubators – physical or hybrid learning environments where learners engage in real-world, project-based application of AI alongside industry mentors. These living labs support innovation, co-creation, and in some cases entrepreneurial experimentation—an approach that mirrors traditional apprenticeship models.

Higher education institutions have played a crucial bridging role, as confirmed by MCI and Algebra University. Both institutions operate at the intersection of vocational and academic education, with Algebra University offering qualifications from EQF Level 4 to 7, and MCI emphasising the applied, industry-responsive nature of its teaching model. These HEIs contribute to curriculum development, teacher training, and pedagogical innovation while ensuring alignment with both academic and vocational standards. They also extend the reach of the project through international networks and established collaborations in higher education. The cooperation between HEIs and VET providers is promising for developing modular, scalable, and future-oriented learning offers.

Additionally, real-world use cases and industry-informed content have been developed to support upskilling and reskilling in applied AI. These are already being incorporated into MOOCs and training modules tailored for both learners and trainers, addressing sector-specific needs and ethical AI literacy. While the project does not aim to issue private-sector branded certificates, its close collaboration with industry actors helps to ensure that training remains demand-driven and market-relevant. In summary, while formal qualification recognition is an expected future result, the project has already made progress in content development, pedagogical innovation, and strategic alignment with EU-level qualification and skills frameworks.

Contribution to enhancing the quality and attractiveness of VET

The AI4VET4AI project has taken a range of steps towards enhancing the quality and attractiveness of vocational education and training (VET), particularly in light of rapid digital transformation and labour market shifts linked to artificial intelligence (AI). The expected outcomes of the project included: increasing the relevance and responsiveness of VET to emerging technologies; embedding AI literacy and transversal competencies into VET systems; upskilling teachers and trainers; fostering innovation ecosystems through AI campuses and incubators; and aligning learning pathways with labour market needs and EU policy frameworks (such as DigComp, ESCO, and GreenComp).

One of the project's most visible aspirations is the growing engagement of VET institutions across multiple regions, including within the 18 NUTS2 areas targeted by the initiative. While AI-focused training content is being developed to serve both as standalone modules and enhancements to existing curricula, interviews suggest that implementation is still underway. According to Solvership, ten thematic curricula are being finalised under Work Package 4, with attention to alignment between learning outcomes and AI applications across sectors like logistics, tourism, and healthcare. New MOOCs are also under development, with the intention of serving diverse learner groups, including employed adults seeking to reskill. Inercia Digital confirmed that MOOC content is in the design phase and that real-life use cases are planned to support applied learning, although this content had not yet been deployed at the time of interview.

While the project's emphasis on applied, scenario-based learning is widely endorsed by partners, interviewees primarily spoke to planned approaches rather than confirmed results. For example, the use of “learning factories” and “AI campuses” was described by Algebra University as part of the CoVE's innovation model to make VET more practical and appealing, particularly

in non-ICT sectors. The project also aims to strengthen VET's reputation by investing in teacher professional development. Fourteen AI-related training modules for educators are currently in progress, as noted by both Inercia Digital and Solvership, with a dual focus on building trainers' capacity to teach AI content and to use AI tools in their own pedagogy. These modules are expected to enhance teachers' confidence and competence in delivering future-ready education but had not yet been completed or piloted at the time of the interviews. This dual focus on capacity building for both learners and educators reflects the project's ambition to make VET more adaptive, inclusive, and aligned with rapidly evolving labour market needs – though tangible evidence of widespread rollout or impact will only become clearer in the latter phases of the project.

A significant success factor of the AI4VET4AI project has been the active engagement of partners with external stakeholders, including companies, civil society groups, and public authorities who contribute to the co-design of content and awareness-raising activities. In 2024, the project organised 80 events across 11 countries, engaging a total of 1,943 participants in discussions about AI and vocational education and training (VET) as well as having 71 collaboration agreements signed between VET providers and companies and the collection of 23 datasets to support the development of practical teaching materials²⁵. For example, in September 2024, an event titled *"AI-Powered Vocational Education and Training – Insights and Best Practices from Different Perspectives"*²⁶ was held to discuss practical approaches for embedding Artificial Intelligence (AI) into vocational education and training (VET). These events attracted broad participation from entrepreneurial ecosystems, educators, and policy students.

Partner-led events have also taken place. For example:

- AlterContacts (Netherlands):
 - Hosted a dedicated session for female entrepreneurs in non-tech professions, offering practical insights into how AI tools can support sustainable business and the interviewee noted that *"For (these entrepreneurs) artificial intelligence is something that is almost scary... The awareness raising was very helpful for them to learn that these kinds of projects exist."*
 - Ran an event for university professors, where educators engaged critically with how AI was changing pedagogical approaches. In relation to this event AlterContacts noted that *"Actually, the teachers of the university had maybe more questions than the students about the topic of AI... This helped us in framing the content of this new VET curriculum."*
 - Delivered a policy-focused session for international relations students, future policymakers, in collaboration with the Dutch Ministry of Foreign Affairs.
- Inercia Digital (Spain):
 - Co-led awareness-raising events across various sectors, contributing to a Europe-wide campaign to reach thousand, stating that: *"We have made a lot of agreements and raising awareness events and we have gathered many participants from all around Europe."*

These initiatives have raised awareness, informed course development, and helped ensure that training remains aligned with regional and sectoral needs.

As previously detailed, while some expected results are still underway, such as the full implementation of incubators and formal qualification recognition, it may be said that the project has contributed to increasing the visibility and perceived value of VET, as reflected in the 80 awareness-raising events held across 11 countries in 2024. By aiming to connect emerging AI competencies to practical, career-oriented learning opportunities, AI4VET4AI has the potential to enhance the attractiveness of VET, not only to young learners but also to adult learners and

²⁵ [News - AI4Vet4AI](#)

²⁶ [AI4VET4AI Dissemination Event in Regensburg: A Glimpse into the Future of AI-Powered Vocational Education - Algebra Lab](#)

industry stakeholders. The ongoing development of transnational joint modules and micro-credentials is expected to support greater portability and recognition of VET across EU Member States in the second half of the project.

4.4. Success factors

Added value of AI4VET4AI

The AI4VET4AI CoVE project has delivered added value to participating organisations by catalysing innovation, deepening collaboration across sectors, and positioning VET as a strategic lever for technological and societal transformation, as evidenced by partner accounts from institutions such as MCI, FIŠ, Solvership, and AlterContacts. For many of the partners interviewed, the project has enabled activities and partnerships that would not have been possible otherwise—most notably, the structured co-development of AI-focused curricula between higher education institutions (such as MCI, Algebra University, and FIŠ), VET providers, and non-academic organisations like Solvership and Inercia Digital. As Solvership noted, these collaborations have focused on creating parallel courses for both learners and teachers, tailored to different sectors. MCI further highlighted that the project brought together institutions with traditionally separate mandates—vocational and academic—into a coherent framework for content co-creation and delivery. Additionally, and as previously detailed, AlterContacts described how stakeholder-driven events have helped inform curriculum content based on real-world needs, such as in sustainable entrepreneurship and public sector contexts. These efforts support the development of integrated learning pathways that bridge secondary, post-secondary, and adult learning, and enhance alignment with evolving labour market demands.

Organisationally, the CoVE framework has allowed VET and higher education institutions to collaborate on an equal footing, co-leading work packages, aligning pedagogical practices, and establishing shared innovation goals. Several institutions, such as MCI and Algebra University, noted that the project helped them break down silos between vocational and academic education, providing opportunities to jointly design AI training modules, upskill educators, and test digital learning formats (e.g., MOOCs, use-case-based modules) that are now being embedded into institutional strategies.

Among specific stakeholder groups, students and teachers have seen early-stage benefits. Learners are beginning to access applied AI learning opportunities—such as through real-life use cases and plans for living labs or AI campuses—designed to be relevant across a broad range of sectors. While full deployment of these environments is still underway, partners such as Algebra University and Solvership confirmed that curricula are being developed with hands-on, sector-specific applications in mind.

Teachers are also expected to benefit in the near future from newly developed AI-focused training modules and professional development content. Fourteen modules are currently in development, aimed at boosting educators' capacity to navigate and teach in AI-enriched learning environments. This dual focus on learner and teacher development is seen by partners as a key strategy to support VET's evolution into a more adaptive and future-oriented education model.

Companies and industry actors, particularly SMEs and entrepreneurs, have gained awareness and access to AI tools through CoVE-hosted events and engagements. For example, awareness-raising sessions for non-tech entrepreneurs were designed to help demystify AI and foster practical adoption. Moreover, the engagement with non-consortium stakeholders—including ministries, policy students, and self-employed professionals—is providing a foundation for future collaboration and feedback loops.

The CoVE has also contributed to the development of a “skills ecosystem” and knowledge triangle by bringing together education providers, research institutions, and industry actors in a

shared mission. For instance, partners such as MCI and FIŠ described active efforts to align AI-related training content with regional priorities, technical capabilities and sectoral needs.

- (MCI) emphasised the importance of tailoring VET content to applied contexts like tourism and healthcare, aligned with local labour market demands.
- (FIŠ) noted that their work includes engagement with the private sector and support for regional outreach in Slovenia, ensuring that VET provision reflects real-world ICT needs.

Through this regional lens, AI4VET4AI partners are beginning to shape and respond to local labour market needs. While evidence of strengthened regional innovation capacity or sustainable digital transitions is still emerging, the groundwork being laid—particularly through cross-sectoral collaboration and curriculum co-design—suggests a strong potential to contribute to these longer-term goals.

The international dimension of the CoVE has enabled mutual learning and cross-country exchange. Partners regularly reference the diversity of perspectives—ranging from Dutch civil society organisations to Spanish digital training centres and Slovenian universities—that enhance the relevance, scalability, and transferability of the project outputs. Collaboration with 26 partners across 11 countries helps ensure that AI4VET4AI is not only regionally embedded but also transnationally coherent. This has proven particularly beneficial for developing joint modules, standardising micro-credentials, and ensuring interoperability of learning outcomes.

Potential for sustainability, scalability and transferability

The AI4VET4AI project demonstrates potential for sustainability, scalability, and transferability, though full financial independence from Erasmus+ funding remains a longer-term goal. At the current stage, the project's financial sustainability is supported indirectly by partners' strategic integration of AI-related training content into their core institutional offerings. Higher education institutions such as MCI and Algebra University are embedding the developed MOOCs, AI modules, and learning content into regular curricula, ensuring continued use beyond the project lifecycle. Similarly, VET providers and faculties like FIŠ are adapting materials for future regional training delivery, thereby institutionalising project results.

Nevertheless, full financial sustainability—particularly for activities like the operation of AI incubators and VET campuses—will likely require continued blended funding. This may include regional or national innovation funds, private-public partnerships, or future Erasmus+ calls. Some partners are exploring opportunities to secure additional funding from smart specialisation programmes and national upskilling initiatives.

In terms of scalability and transferability, the project has already demonstrated promising outcomes. Co-developed curricula and training modules are modular, aligned with EU skills frameworks such as DigComp, GreenComp, and ESCO, and made available in open-access formats. This design enables use across different educational systems and regional contexts. The incorporation of these frameworks ensures compatibility and coherence with European qualification standards, enhancing the replicability of outputs across Member States.

A notable good practice in HE-VET cooperation is the shared leadership of work packages and the co-creation of AI learning content. Institutions like Algebra and MCI straddle both vocational and academic missions, enabling cross-pollination of pedagogical practices, teacher training models, and technology-driven delivery formats. For example, joint development of AI modules by higher education lecturers and VET instructors ensures that content is both academically robust and pedagogically accessible to diverse learner groups.

Another example of good practice lies in the collaboration between education providers and companies. Several partners hosted awareness-raising events that engaged SMEs, entrepreneurs, and industry experts in dialogue around AI adoption and skills needs.

- AlterContacts organised targeted events for female entrepreneurs, public sector students, and university professors, using their input to inform curriculum development, particularly in ethical and applied aspects of AI.
- Inercia Digital and Solvership also described engaging stakeholders across multiple sectors, with events contributing to shared understanding of how AI is perceived and what skills are required in different domains.

Several partners hosted awareness-raising events that engaged SMEs, entrepreneurs, and industry experts in dialogue around AI adoption and skills needs. This feedback was then used to shape curricula and inform real-life use cases included in the training. For example, Solvership noted the importance of developing sector-specific content and training for both learners and trainers, guided by real-world needs. The AI4VET4AI incubators, learning factories and AI VET campuses are envisioned as living labs to further deepen this collaboration by positioning learners to solve practical challenges faced by businesses, under the mentorship of professionals. While these infrastructures were still under development at the time of interviews, several partners—including Algebra University and MCI—highlighted the potential of these applied learning environments to enhance engagement with industry and support regional innovation ecosystems.

Though still in early stages, these initiatives were viewed by the interviewed partners as holding strong potential to offer scalable, transferable models of work-based learning that move beyond traditional apprenticeship frameworks, particularly by embedding AI innovation into sector-specific challenges.

4.5. Overall impact and lessons learnt

At the halfway point of the AI4VET4AI project, the overall impact has been marked by a shift in how vocational education and training (VET) stakeholders engage with digital transformation, particularly through the lens of artificial intelligence. The project has catalysed stronger integration between higher education and VET institutions, creating shared frameworks for curriculum development, teacher training, and AI-related pedagogy. Interviewed partners across the consortium consistently noted that the CoVE has enabled them to move beyond fragmented initiatives and toward more coordinated, ecosystem-based approaches to skills development. One key takeaway has been the value of multi-level cooperation. From national education providers to local entrepreneurs and international research hubs, the project has shown that innovation in VET must be both context-sensitive and transnationally informed. Real-life engagement with non-tech sectors revealed gaps in AI awareness and access, prompting the consortium to adapt training content accordingly.

Another important learning is that pedagogical innovation must go hand-in-hand with institutional change. While the creation of MOOCs, use cases, and AI learning modules has progressed well, the consortium recognises that uptake and sustainability depend on embedding these outputs into long-term strategies and regional training systems. Furthermore, the emergence of tools like ChatGPT during the project lifespan prompted some of the partners interviewed to rapidly revisit their assumptions about AI literacy and teaching methods – highlighting the importance of agility and continuous learning in CoVE operations.

5. AILEEN – centres of vocational Excellence in Aerospace & defence for advanced manufacturing

5.1. About AILEEN

Background information

- **Project name:** AILEEN - centres of vocational Excellence in Aerospace & defence for advanced manufacturing
- **Duration:** 2023-2027
- **Call year:** 2022
- **Project status:** Ongoing

AILEEN is a CoVE project coordinated by the European Federation for Welding, Joining, and Cutting (EFW) in Belgium. It brings together a network of 17 partner organisations from seven countries: Belgium, Denmark, Germany, Portugal, Spain, Türkiye, United Kingdom. The partners consist of **education providers** (predominantly private providers from the VET system as well as universities), **industry partners**, **industrial/research** cluster organisations as part of the European Defence Network, and **umbrella associations** such as EFW.

Objectives of the CoVE project

The main objective of AILEEN is to **address the shortage of skilled and qualified personnel within the Aerospace & Defence (A&D) sectors** by establishing CoVEs in **Advanced Manufacturing (AM)** (including welding, brazing, additive manufacturing technologies, and inspection) and consolidating systematic conditions for quality assurance in vocational education and training (VET) to ensure the quality of synergy and cooperation across the participating countries²⁷. These CoVEs will be created from existing VET centres in each participating country via a nomination process, through which they will undergo an evaluation and assessment process to become an officially authorised AILEEN CoVE²⁸. They aim to **strengthen quality assurance in VET** across participating countries, and are designed to equip learners with the skills and knowledge needed to **drive recovery, growth, innovation, and competitiveness in the A&D sector**, as well as form a **sustainable formal network of education, research, and industrial organisations** to ensure **specialised sectoral training, knowledge transfer, and alignment with industry needs**²⁹.

Additional objectives of the project are to:

- Develop and disseminate innovative methodologies and tools for training in A&D
- Develop **AM, technological, digital and green skills** required for the transition to a circular and greener economy
- Disseminate best **practices in Vocational Excellence in AM for A&D sectors** within a network across Europe.
- Update the **European/International Harmonised Curricula for Welding Qualifications and AM Qualifications** according to the specific requirements of the Aerospace and Defence ecosystems.

²⁷ Verlinde, W (Belgian Welding Institute) (2024), D2.4: Strategic Plan for Advanced manufacturing Aerospace & Defence CoVEs (lead beneficiary BIL): From VET to CoVEs.

²⁸ Verlinde, W (Belgian Welding Institute) (2024), D2.4: Strategic Plan for Advanced manufacturing Aerospace & Defence CoVEs (lead beneficiary BIL): From VET to CoVEs.

²⁹ [Search - Erasmus+](#)

Strategic vision and objectives

The overarching vision for AILEEN includes the **creation of long-standing, mutually beneficial synergies between training providers, research institutions, and industrial stakeholders**. The key strategic objectives then include the following³⁰:

- **Address manufacturing skills needs** of the ecosystem and industry by offering specialised training programmes, including emerging technologies and processes
- Ensure the **education/qualification for Aerospace and Defence Professionals** in the scope of the CoVEs' Network, underpinned by **quality assurance principles**
- Support **alignment with quality standards and certifications** relevant to A&D manufacturing
- Encourage **use of flexible education, training, and cooperation 'best practices'** between stakeholders within the ecosystem
- Connect **network training providers in AM** to ensure complementarity in training provision and establish **continuous cooperation with A&D companies** to understand their requirements and challenges – promoting real cooperation among the training-research-industry knowledge triangle.

Overall, AILEEN seeks to enhance growth, innovation, and competitiveness in the A&D sectors through a robust, responsive, and quality-assured educational framework. Aligned with the European vision for VET excellence, AILEEN supports the advancement of technological and digital skills in AM and the development of a network of CoVEs that ensure VET systems remain agile and responsive to labour market needs³¹.

5.2. Activities of AILEEN and skills developed

Activities covered

The AILEEN project undertakes a range of activities related to establishing a network of CoVEs that aim to strengthen VET in A&D sectors. A structured methodology was developed to guide the **nomination** of CoVEs within the A&D sector. This process mainly focused on **establishing robust quality requirements** to ensure operational excellence during and beyond the project's funding period. A pilot nomination process is currently underway to evaluate the suitability of the proposed criteria and supporting evidence for quality assurance purposes. Strategic planning for this was informed by comprehensive market research and surveys that targeted both stakeholders in industry and VET centres to identify critical skills gaps, particularly in welding and manufacturing inspection, and informed the development of new competence units that aligned with market needs.

Specifically, under the core clusters:

1. Teaching and learning

The AILEEN project has focused on building a training framework that responds to the skill needs of the A&D sector. Education providers and certification bodies are collaborating to design and validate this framework, ensuring that it is underpinned by **robust quality assurance mechanisms**. They are also involved in developing the necessary tools, particularly in assessment, to ensure the training implementation is harmonised. Additionally, industry partners have contributed by refining the scope of training to reflect real world applications, particularly in welding and AM.

³⁰ Verlinde, W (Belgian Welding Institute) (2024), D2.4: Strategic Plan for Advanced manufacturing Aerospace & Defence CoVEs (lead beneficiary BIL): From VET to CoVEs.

³¹ Verlinde, W (Belgian Welding Institute) (2024), D2.4: Strategic Plan for Advanced manufacturing Aerospace & Defence CoVEs (lead beneficiary BIL): From VET to CoVEs.

Training content has also been informed by market research and the surveys that identified gaps in current provision. These insights helped guide the development of new competence units and assessment tools. Furthermore, two university partners will be involved in delivering training, specifically advanced training, in AM (such as additive manufacturing, welding, and inspection) at EQF levels 6 and 7, implementing and leading applied research projects in collaboration with industry partners, and helping the design of courses in collaboration with VET centres. **Incorporating universities into their ecosystem allows the project to provide more advanced training, as well as ensure that the research is aligned closely with industry needs** in order to have direct impact on the sectors. The involvement of cutting-edge research institutions allows for **knowledge sharing** to facilitate training and applicability of the content.

2. Cooperation and partnerships

Cooperation and collaboration across sectors, countries, and partners, has been integral to the project's development and delivery. In fact, the **transnational scope** of the project and its involvement of a **wide range of stakeholders and partners** were cited by interviewees as a **prominent success factor**. The AILEEN online platform was established as a centralised point to support interaction among CoVE stakeholders through discussion forums, sharing best practices, and providing access to specific training materials.

The project has actively promoted vocational excellence via **skills competitions organised by education providers**, with **strong support from industry partners in terms of financial backing, promotion, and dissemination**. These events served to raise awareness of the project, engage students, and showcase the relevance of vocational training in high-tech sectors. Additionally, in February 2025, the project coordinators successfully conducted a validation workshop in Germany which was represented by a large number of AM and defence experts. The purpose of the workshop was for the project leads to present their training framework, including their specific training requirements, to the industry to solicit feedback and input from wider stakeholders.

Educational institutions, industry organisations, and training providers, all work closely together to transfer insights from one organisation to another. Universities develop fundamental research, and then work in partnership with research centres to develop this into **applied research programmes used for training**. These programmes are then designed to address real-world industry challenges, with students working on practical solutions under academic and industrial supervision. This approach enhances learning experiences and also strengthens the link between education and innovation. For instance, if a company in the A&D sector is struggling with more complex issues, training providers can liaise with universities to either produce or provide insight into relevant research in that domain. This research is then taken by training providers and adapted to work-based or problem-based training. In one case, a stakeholder from EWF had noticed some companies were struggling with more fundamental issues in additive manufacturing, and then asked a partner University to help address this. Following that, the university connected the organisation with a PhD student who then worked on that issue and provided the research to EWF who then translated the research back to the original company. One education and training interviewee highlighted that this **synergistic way of working in turn helps drive the industry forward**.

Additionally, **apprenticeship** programmes are currently being finalised for their September 2025 launch, and are designed by education providers and hosted by industry partners to ensure learners gain hands-on experience in industry settings.

Furthermore, **regional ecosystems have been established in each participating country**, with each focusing on specific technologies relevant to their local context. While some partners had existing collaborations, others are engaging in cross-sectorial cooperation for the first time. Due to the demands of the defence sector, the project needed to prioritise emerging needs, which required involvement of Member States' military authorities. However, this engagement, though essential, proved to be an ongoing challenge.

3. Governance and funding

To ensure long-term sustainability of AILEEN's CoVE network, the project has established a **comprehensive governance structure**. A Steering Committee is responsible for overseeing the nomination and approval of new CoVEs, with sector representatives leading the approval processes. An Advisory Board, consisting of research organisations, education providers, and industry organisations, has also been established to identify the needs and priorities of the A&D sectors and provide strategic guidance to ensure the training framework remains aligned with the sectors' evolving needs.

The EWF serves as the coordinating organisation. With over 30 years' experience in managing international qualification systems, they ensure that training implementation across member countries adhere to consistent quality assurance standards and is recognised transnationally. Their role as a certification and quality assurance body is central to the credibility and scalability of the CoVE model. The project is also actively building a transnational CoVE network with defined governance mechanisms to ensure continuity beyond the project's funding period.

Skills developed

The AILEEN project covers a wide range of skills related to AM in the A&D sectors. Specifically:

- **Technological skills** – in particular, there is a strong focus on developing transversal and technological skills in AM such as welding, additive manufacturing, brazing, and inspection. The training is mainly job-specific, with core profiles established for industry organisations that range from operating technician to engineering designer. As these profiles are already embedded within existing international qualification systems, the project is developing new competence modules and training to address specific industry needs in AM within their ecosystem. So far, 5 competence units have been developed for welding at EQF levels 3-6, 3 units in inspection, and 3 in additive manufacturing.
- **Digital skills** – the digital programmes include developing skills in artificial intelligence (AI), cybersecurity, 3D modelling, automation, and data acquisition analysis, with the focus on how to bring these concepts into the A&D sectors. For example, they aim to look at the full potential of 3D modelling in engineering beyond just drawing, moving to looking at skills in automatic welds and automatic printings. There are currently approximately 8 digital skills competence units developed so far.
- **Green skills** – training for green skills is currently less developed than the others, however its focus is primarily on sustainability, with the push of making more sustainable designs in AM. The project is looking into developing training that target EQF levels 4-6.

AILEEN has adopted various **EU skills frameworks** to develop their modules, particularly the **DigiComp** and **GreenComp** frameworks served as 'inspirational tools', and were used to align core skills to develop their green and digital modules. To do this, the project team looked into the domains of each tool to map the level of complexity to the sector and needs of workers. Other frameworks adopted by CoVEs such as Katapult and LCAMP were also consulted.

Learning and teaching methods

To facilitate the development or cultivation of AM specific skills, AILEEN will incorporate various training and teaching methods within their CoVEs that interlink to engage learners. This includes:

- **Problem based learning** – a key innovative method of AILEEN which focuses on real industrial problems to enable students to develop an active approach to problem solving. The project has developed a problem-based learning kit to be used during the courses to support teachers and trainers in delivering the training, and students in learning.
- **Applied research** – universities and research centres will collaborate to define industry problems that students can target whilst working with AILEEN'S industry partners. The

student, company, and their teachers will determine the type of project they will develop. This activity is intended to be 3-6 months of deep research, and may involve the student participating actively within the company's operations. These companies can then determine themselves if they would be able/willing to receive the student for a longer period of time, or more frequently, in order to provide a more immersive experience within the fields of A&D. However, a key challenge identified by interviewees was the fact that the sectors have a wide range of activities and technological needs, making it difficult to narrow down. Regardless, this would result in wide diversity of applied research projects produced. An applied research kit and manual are both currently under development.

- **Work-based learning** – this enables on-job experience within A&D companies to train students to do specific jobs within these sectors. For example, students may undergo general training in tick welding, however if they want to pursue this in the aerospace industry, specific training is required that is difficult to incorporate into basic training. In these cases, individuals need specific work-based training to acquire skills that are specific to the company or job.

Training materials and resources, as well as guidelines on how to design and implement problem-based and work-based learning practices within these materials, are currently under development. Tools such as VR or AR are not being developed through AILEEN, but may be utilised by some project partners to enhance training. All resources and training materials, such as the toolkits, competency units, and course content will be stored on the project website and made publicly available and accessible. The website provides a centralised environment with the following purposes: sharing best practices between teachers as well as between students; mapping stakeholders of each CoVE; signposting of different training opportunities for specific areas; sharing resources; sharing the training standards for different types of AM.

5.3. Results expected and achieved

Contribution to the development of qualifications

As the CoVEs have not yet been implemented, the project is still in the development stages. AILEEN is working towards **updating the current European Qualification System in AM areas such as joining, welding, and additive manufacturing, focussing specifically on specialised training and qualifications**. They are aiming to produce a catalogue of specialised training modules, with 20 currently in development, half of which are awaiting piloting.

AILEEN will have **micro-credentials** as the training provided is **modular based**, therefore each module can be standalone or combined as part of a larger qualification/course. For example, students may wish to combine modules to integrate into a larger qualification, or take a single module to obtain a specialisation or specific knowledge and receive a smaller qualification. This approach allows for the provision of small independent units of training, the subsequent assessment of these units, and a final AILEEN certificate to explicitly state the knowledge and skills achieved, and what it corresponds to. The project is currently preparing transition arrangements to enable recognition of the courses and certificates within the existing EWF and Performance Review Institute (PRI) systems. Following this, all certificates will be issued by the hosting organisations and supervised by EWF and PRI to ensure validity and legitimacy.

The project is currently developing **apprenticeship programmes that aim to last 1-6 months**. Decisions on the scope of training will be made between the hosting organisation, training provider, and student, with a formal agreement signed by all parties. The percentage of curriculum covered within these apprenticeships will depend on its length. Although the coordinators were unsure if any partners are already a part of or considering joining or collaborating with the European Alliance for Apprenticeships (EAfA), this is something they will look further into.

While the qualifications will be recognised by private partners, **AILEEN has not yet worked with national qualification frameworks** due to the **complexities of involving national authorities** as the **processes and procedures to establish international qualifications differ between countries**. After piloting the courses and testing the adequacy of the tools and training programmes, they will be able to finetune and then present a consolidated product to national authorities. This way, the coordinators will be able to explain what does and does not work, and what will be suitable for each specific country.

Contribution to enhancing the quality and attractiveness of VET

As the project has not yet been implemented in full, there are no measurable project outcomes so far. Additionally, it is still too early to report substantial impacts related to VET provision and skills as the standards are not yet developed.

However, **AILEEN is complementing and supporting national, regional, and local strategies to enhance the quality and attractiveness of VET through establishing their network of CoVEs in A&D** which will become a **centralised reference point** for those looking for resources or information on AM training in these sectors. They are hoping to make a difference to the field by recognising and rewarding excellence, and by providing quality training, complementing local strategies through becoming an established, reputable network that industry organisations and training centres would be keen to approach. Furthermore, having this **excellence hub operating at a local level would better enable the sharing of best practices** among organisations due to the complementarity of the activities and the collaboration between all parties.

The **cross-collaborative nature of the AILEEN project has substantially strengthened and expanded partnerships among key stakeholders** according to interviewed stakeholders. To facilitate the formation of new partnerships and strengthening of pre-existing relationships, the project began by mapping the core capabilities and best practices of each participating organisation, highlighting their potential contributions to the network. This helped foster open dialogue, enabling partners to explore potential joint activities and define their collective value at national level to address sectoral needs.

Additionally, the project has **increased visibility within the A&D industry and attracted interest from new organisations**, as well as boosted the ability of existing partners to reach out to new organisations. For example, they were able to collaborate with Skywin, an aerospace cluster organisation with no prior involvement in the project, and offer training in additive manufacturing where such expertise was previously lacking. Through AILEEN, partners have also expanded their networks internationally. For example, after presenting at a conference, one partner was approached by the Dutch Army to conduct applied research, support training efforts, and assist in qualifying 3D-printed products. This has led to advisory roles in training and certification, further strengthening cross-border collaboration.

However, a **major challenge in the aerospace and defence (A&D) sector is the high level of confidentiality** – approximately 90% of work is conducted under strict Non-disclosure Agreements. This makes it difficult to develop standardised training programmes. Instead, providers must tailor training to individual companies by visiting their facilities, understanding their processes and materials, and designing bespoke training aligned with specific operational requirements. Typically, this begins with foundational knowledge and progresses toward applied, company-specific skills.

Several AILEEN partners are also engaged in other EU initiatives. For instance, EWF is active in the Pact for Skills and other defence-related programmes. They regularly share AILEEN's outcomes (such as framework design, industrial partner engagement, and micro-credentialing) within these communities, promoting best practices and peer learning. Building on previous work, partners like Mercantec and EWF, who coordinated the earlier Blueprint on Additive Manufacturing, are now refining and updating content to better align with the specific needs of the A&D sector.

Looking ahead, AILEEN aims to contribute to broader EU strategies, including the European Green Deal and the Digital Strategy. Through its green and digital skills training programmes, the project seeks to upskill students and professionals, equipping them to apply this knowledge effectively within the A&D sectors.

5.4. Success factors

Added value of AILEEN

The AILEEN CoVE project is delivering benefits to all stakeholders involved, with a strong emphasis on skills development, collaboration, and international engagement, according to interviewed stakeholders.

Students

Students are able to **gain access to highly specialised training that is tailored to the specific needs of the A&D sectors** to ensure they **acquire the skills and knowledge required** by industry. In addition to traditional learning, students are given the opportunity to engage in **'learning by doing' through apprenticeships and applied research programmes**, allowing them to take an active role in their learning and training. These opportunities enhance their employability by preparing them for real-world roles in a sector where demand for skilled professionals is high. Furthermore, AILEEN is helping to inspire students as young as secondary school level by showcasing the variety of career pathways available in A&D and encouraging them to pursue vocational training in this field. This is already being demonstrated through the various skills competitions.

Trainers and educators

Trainers and educators also benefit from the project through opportunities to **share best practices and participate in events that foster professional development and knowledge exchange**. The AILEEN website serves as a central hub where teachers, students, and industry stakeholders can access information on additive manufacturing (AM) and A&D training, as well as share learning experiences and resources.

Industry

Partners in industry will benefit from the project by **gaining access to a workforce that is already trained to meet not only industry, but potentially company specific needs**. This reduces time and cost associated with internal training. Furthermore, strengthened collaboration between industry and VET providers ensures that training remains relevant, responsive, and aligned with real-world demands. This is further strengthened by **early and continuous industry involvement** in the CoVEs in defining training content and the validation processes.

Ecosystem

AILEEN has enabled the development of **highly specific and specialised training** that would not have been possible without this project. While there was already a transnational scope to training in these AM technologies, the **project addressed a critical gap by aligning training content with industrial requirements and relevant quality standards**, that was previously lacking. AILEEN will also work towards establishing a common framework for both training delivery and assessment, ensuring that all CoVE members can operate under consistent quality requirements and share resources effectively. As CoVEs need to undergo a certification and qualification process to join the network, this provides an added value to the network in verifying each member's legitimacy and competence. Therefore, having an AILEEN accreditation will provide a level of legitimacy on the market, and provide members and partners confidence in their capabilities.

The **international dimension of the project is fundamental to its operations** as it builds on existing transnational curricula and industrial systems, refining them to better meet needs of the A&D sector. Moreover, the project has **widened their network by forming connections with**

new organisations such as the Dutch Army and ESA, which has provided them with opportunities that would not have been available without AILEEN, such as transnational training, research, and product development. These **partnerships have therefore increased the project's visibility and impact across Europe**. Activities such as the skills competitions have also helped drive the increased visibility which has been beneficial for the project.

Potential for sustainability, scalability and transferability

Sustainability

The project coordinators are actively working to **develop sustainable business models that will ensure the continuity of the initiative beyond the current funding period**. One of the primary models under consideration is a **fee-based** system, where network members would pay a fixed fee to access the AILEEN framework. This access would grant them continued authorisation and recognition within the ecosystem. Additionally, use of **sponsorships** is being explored to support specific activities, such as the skills competitions, should these be retained.

A key challenge remains the identification of appropriate governance structures within each CoVE. Establishing clear governance will be essential to enable effective stakeholder collaboration to maintain ongoing activities. There are still ongoing discussions around setting fixed training costs, with considerations of no fees or differentiated access fees, with reduced rates for educators and students, while companies would pay full fees. However, ultimately this these will be determined through agreements among stakeholders, **allowing each CoVE to develop its own business model for training delivery and partnership maintenance**. The coordinators anticipate having a more concrete and actionable model within the next six months. One interviewee noted that AILEEN's rigorous vetting process for CoVE membership enhances the network's credibility, which is likely to attract additional industrial partners and contribute to long-term sustainability.

Scalability and transferability

Higher education institutions and VET providers have played a central role in AILEEN's development. Transferable success factors in effective collaboration between these stakeholder types include conducting **collaborative working sessions to bring stakeholders together to share expertise and engage in dialogue on key topics**. Additionally, the delivery of skills competitions further strengthened ties between companies from the A&D industry and education providers. Therefore hosting more opportunities for collaborative working should be considered when scaling up.

This **cross-collaboration within AILEEN has positioned CoVEs as intermediaries between industry and education**. They facilitate two-way knowledge transfer: translating academic research into industry-relevant insights, and relaying industry challenges back to research institutions. This dynamic enables CoVEs to act as innovation hubs, connecting industry needs with academic capabilities, including through engagement with postgraduate researchers, as one interviewee stated, *"we have a role to play as CoVEs to capture ideas and questions from industry and transfer them back to other partners"*. This model of accessible knowledge exchange is replicable and can be adopted by other CoVEs.

AILEEN's transnational scope ensures that its training programmes are not tailored to a single organisation. Instead, they are designed with flexibility, allowing adaptation across different systems and companies. While some resources remain the intellectual property of individual universities, AILEEN strives to develop shared outputs that are accessible to all participating organisations to ensure the maintenance and transfer of knowledge. Furthermore, the **emphasis on work-based learning and applied research supports the transferability of skills across contexts**. AILEEN is also identifying and promoting best practices from within its network as part of its CoVE nomination process. Selected practices will be showcased on the excellence platform, enabling broader dissemination and uptake by other organisations. Additionally, the use of micro-credentials and modular training formats enhances scalability and

adaptability as these approaches allow for targeted skill development and can be easily implemented by other CoVEs.

Finally, AILEEN's qualification and certification process serves as a form of quality assurance. This model can be transferred to other CoVEs, providing a recognised standard that validates their capabilities and reinforces their credibility within the ecosystem.

5.5. Overall impact and lessons learnt

As the AILEEN project is still in progress, its long-term impacts are emerging. However, several early achievements are already evident:

- **Identifying Skills Gaps:** AILEEN has helped detect current and future training needs in the A&D sectors. This has helped support upskilling and reskilling efforts, and enabled partners to start bridging the gap between VET and industry.
- **Standardisation and Quality:** The project has advanced the consolidation of quality standards in AM in A&D, increasing stakeholder familiarity with sector-specific regulations.
- **Innovative Learning Approaches:** The integration of problem-based learning, work-based learning, and applied research offers effective, industry-relevant training pathways for future professionals aiming to establish careers in A&D.
- **Collaborative Ecosystem:** AILEEN has fostered strong partnerships across stakeholder groups with different groups working synergistically towards the common goal of establishing and implementing industry-relevant training. CoVEs have proven effective in promoting open dialogue and knowledge-sharing between education and industry.
- **Transferability:** The methodologies, including the quality assurance model developed for A&D CoVEs, are designed to be adaptable to other sectors.

Following from this, the expected impacts of the project are as follows:

- **Excellence Platform:** The upcoming AILEEN platform is expected to be a major impact driver – serving as a global hub for best practices; mapping of experts, other CoVEs, and industry organisations; training resources, and community forums. This is particularly valuable in the highly specialised A&D sector, where those in the sector of all levels (e.g., students to researchers to established engineers) often require expert assistance. As there are very few experts in these sectors, having a centralised point will facilitate the location of experts.
- **Network Expansion:** AILEEN aims to establish a sustainable, cross-border network of at least 16 CoVEs, extending beyond the initial 7 partner countries. These CoVEs are hoped to align on training and cooperation activities, acting as local catalysts of excellence.

Ultimately, AILEEN aspires to contribute to a more skilled, future-ready workforce and a self-sustaining, scalable network of excellence across Europe and beyond.

6. Auto CoVE 2.0

6.1. About Auto CoVE 2.0

Background information

- **Project name:** Auto CoVE 2.0
- **Duration:** 2023-2027
- **Call year:** 2022
- **Project status:** Ongoing

Auto CoVE 2.0 is led and coordinated by Omnia, a lifelong learning centre located in Finland.

It involves 16 consortium partners across eight countries (Finland, France, Germany, Estonia, Latvia, Lithuania, Netherlands, Turkey). The partners involved include seven VET schools, three Universities of Applied Sciences, four automotive companies and one national research centre³².

Objectives of the CoVE project

Developing digital and practical skills in sectors focused on combating climate change and adopting clean energy is crucial for Europe's sustainable growth.

In this context, the Auto CoVE 2.0 project aims to bridge the existing skills gap in the automotive sector by concentrating on advanced topics such as electric vehicles (EVs), battery technology, hydrogen transportation, and advanced driver assistance systems (ADAS). By addressing these areas, the project aims to ensure that VET graduates acquire relevant, up-to-date skills that align with the industry's evolving needs.

The project focuses on creating tools for upskilling and developing educational content to support the ongoing retention and advancement of the workforce in the sector. Additionally, it aims to facilitate the exchange of specialised knowledge, enabling mutual learning among experts to strengthen the overall expertise within the industry.

6.2. Activities of Auto CoVE 2.0 and skills developed

Activities covered

Auto CoVE 2.0 focuses on upskilling teachers, trainers, and instructors in emerging technologies in the automotive sector, bringing together education, research and industry stakeholders into its consortium.

Regarding the specific activity clusters:

- The **Teaching and Learning** cluster of Auto CoVE 2.0 began with a comprehensive skills gap analysis, based on a survey conducted by the consortium partners in Germany and Finland. Over 375 responses from teachers and mechanics were collected via regional networks in the seven countries, which exceeded the initial targets, directly informed the development topics for the Auto CoVE study modules. In addition to shaping content, the survey also contributed to the development of Auto CoVE 2.0 regional partnerships across the eight countries, as companies could indicate their willingness to stay involved and attend future dissemination events. The remaining activities within this cluster involve the development of e-learning modules via the platform of the Dutch consortium partner (Electude International). Course content creation follows a structured collaborative process, supported by Electude International's best practices for course design.

³² <https://www.autocove.eu/about-us/>

- The **Cooperation and Partnerships** cluster drives course content creation, notably through biannual Collaborative Development Workshops held from 2024 to 2026. These five-day workshops gather secondary teachers, university lecturers, project managers, technical developers, and business representatives. Each team teaches the modules they developed, with others acting as students, followed by detailed evaluations using didactical influence studies. This provides a feedback loop to improve pedagogical quality while incorporating the latest industry insights. Business representatives also present current technological trends to keep the content cutting-edge. The Auto CoVE 2.0 courses are finalised through this process.
- The **Governance and Funding** cluster focuses on project management, quality assurance, risk management, dissemination, and impact evaluation. Dissemination activities started ahead of schedule, with national events already held in Finland, Latvia, Germany, and France. Developed modules are translated, proofread, and prepared for broader dissemination. English versions will be published via the European OER Commons platform and Electude International's global dissemination hub, making materials accessible to a wider audience.

As described by the project coordinator, each of the VET schools in the consortium build their own regional partnerships, effectively creating “regional ecosystems” around the project's topics. A key component of this approach is the Auto CoVE 2.0 regional dissemination events, organised by the consortium partners in their respective countries. At these events, the VET schools invite teachers in the automotive field from affiliated colleges and polytechnics, as well as representatives from automotive repair SMEs to their campuses. The dissemination events constitute opportunities for the Auto CoVE 2.0 consortium partners to present and demonstrate the materials developed through project, explaining how they can access, use, and benefit from them. These events serve as a platform for stakeholders to meet, exchange ideas, and build mutual trust. From the project coordinator's perspective, these events serve to strengthen regional and national networks within the automotive sector.

Skills developed

The Auto CoVE 2.0 project develops 17 study modules and training courses focused on vehicle technology and sales. These modules target VET teachers, students at secondary and tertiary levels, and automotive service and sales personnel. Development is based on labour market needs, gathered through interviews with industry representatives and VET teachers across seven European countries. The aim is to address real-world skills gaps in vehicle sector education.

- The study modules, created on Electude International's digital e-learning platform, support the green and digital transitions in the automotive sector. Content includes servicing and repairing new technology vehicles – such as hybrids and hydrogen-powered cars – essential for a clean transition in traffic across Europe. Green skills are reinforced by aligning the modules with the GreenComp framework, enhancing the focus on sustainability and low-emission mobility.
- The project promotes digital skills, particularly through modules on Advanced Driver Assistance Systems (ADAS), which require strong technical and digital competencies. It also integrates STEM-related skills, providing mathematics and physics pathways critical for technical education.
- Regarding transversal skills, communication and sales skills are also addressed through modules that teach students marketing principles, client communication, and spare parts sales techniques.

Consortium partners involved in course content development provide additional information on the innovative aspects of the materials. These include the use of Virtual Reality (VR) for safe, hands-on training, notably in assembling lithium battery packs. Additionally, Artificial Intelligence has been introduced for creating tasks and simplifying language in module development. Professional development for teachers is a key component: they are encouraged to learn new content, participate in job-shadowing placements at partner companies, and attend brand-specific educational events, with associated costs covered by the project.

"We are constantly exploring new technologies, such as hybrid vehicles, which evolve with new innovations each year. One particularly innovative approach we have adopted is using VR for safety and training. For example, students can assemble lithium battery packs in a VR environment, reducing the danger of handling these potentially hazardous materials in real life."

University of Applied Sciences – Consortium partner

Universities of applied sciences, such as Technische Hochschule Würzburg-Schweinfurt (Germany) and Inžinerijos Kolegija (Lithuania), contribute by developing tertiary-level vocational education (EQF level 5) content while also supporting secondary-level material creation (EQF level 4). For instance, this includes the "Battery Learning Experience Journey", a multisensory educational pathway covering battery technology from production to recycling, including second-life applications. The Estonian University of Life Sciences plays a distinct role by developing foundational study modules in mathematics and physics, together with Omnia's expert teachers, for technical students aiming to pursue tertiary-level education.

By combining vocational education expertise, higher education research, and close industry collaboration, Auto-CoVE 2.0 ensures that the skills taught meet current and emerging needs in the automotive sector, promoting comprehensive, sustainable, and future-oriented technical education.

6.3. Results expected and achieved

Contribution to the development of qualifications

The CoVE project is focused on developing new qualifications for vehicle sales and spare parts sales. These qualifications aim to address the skill gaps identified in the automotive sector and will be referenced to the national qualifications frameworks (NQFs) of the partner countries. This integration ensures that the qualifications are recognised and standardised across different regions.

Auto CoVE 2.0 consortium develops innovative study modules and training courses on alternative-fuel vehicle service and sales at EQF levels 4, 5 and 6:

- Study modules for technical and business students at EQF level 4.
- Training courses for vehicle engineer students at tertiary level, EQF level 5.
- Training courses for vehicle maintenance and repair teachers at VET colleges and Universities of Applied Sciences. The same courses will be used for upskilling already working workshop leaders, car mechanics and vehicle sales and spare parts salespersons in vehicle industry in all seven partner countries (EQF levels 4, 5 and 6).

Importantly, Auto CoVE 2.0 adopts a modular, flexible approach by developing 15-credit units that can be rapidly adapted to emerging technologies. These modules will be offered as micro-credentials post-project, aimed at upskilling SME staff and ensuring financial sustainability while enhancing the quality and responsiveness of VET systems.

Collaboration with the consortium's four automotive companies ensures that training materials of Auto CoVE 2.0 align with current industry practices, which will help to make the qualifications more valuable and relevant.

The Auto CoVE 2.0 project has successfully developed and tested new courses on advanced automotive topics, piloted by seven partner institutions at secondary and tertiary levels. Courses developed through Auto CoVE 2.0 are already being piloted, including in areas such as ADAS calibration³³ and vehicle sales, in the partner institutions' curricula. In this regard, Electude International's best practices for digital and interactive course design are guiding the Auto CoVE 2.0 consortium in creating engaging and standardised content across the partner countries, according to the project coordinator.

While these new courses are currently being integrated into the curricula of all partner VET schools, the ambition is to expand and achieve formal recognition of the related qualifications by the national qualification authorities in the eight partner countries as a first step, and in other EU Member States as a second.

Despite the progress, aligning new skills with national qualifications frameworks remains a challenge due to the rapid pace of technological advancement. Nevertheless, Auto CoVE 2.0 is laying the groundwork for future updates to VET qualifications in the automotive sector, particularly in areas such as EV repairs, battery systems, and hydrogen technologies.

Contribution to enhancing the quality and attractiveness of VET

The Auto CoVE 2.0 project aims to enhance VET by developing specialised skills in emerging automotive technologies. By offering up-to-date, industry-relevant training, the project aims to make VET more attractive to students and better aligned with labour market needs. A major focus is integrating these skills into NQFs as a long-term objective, ultimately supporting greater alignment of VET studies across Europe. This will improve student mobility and employability across different countries by creating standardised, recognised qualifications.

Auto CoVE 2.0 also addresses critical skills gaps in the automotive sector, focusing particularly on battery technology, charging infrastructure, and customer communication in vehicle sales. Courses are being developed and piloted to upskill both vehicle mechanics and salespeople, helping to address common misconceptions about EV usage. By providing real-world knowledge, the project coordinator and a consortium partner involved in content development recognise that the project empowers automotive professionals to deliver accurate, experience-based advice to customers, thus supporting healthier and more sustainable mobility habits.

A major achievement of the project is the development of innovative learning content, which has already sparked strong interest among partner colleges and workshops. Once completed, the materials will be made freely available for five years via Electude International's platform, reaching 70 countries and 4,000 technical schools, as well as being shared through OER Commons platforms.

Auto Cove 2.0 also values inclusion by organising student and staff mobilities. Student exchanges are arranged and coordinated by Auto CoVE 2.0 consortium partner schools: i.e., VET colleges and Universities of Applied Sciences. These mobilities involve both secondary and tertiary level VET students and teachers.

Auto CoVE 2.0 has budgeted for 60-80 student mobilities to be implemented throughout the project. Each consortium partner is committed to sending at least six students to another partner country over the project's two-year duration. Students travel in groups, supported by teachers who ensure that any special needs are accommodated. Mobilities involve hands-on learning experiences in partner companies, with secondary-level placements lasting four weeks and tertiary-level placements extending to eighteen weeks.

³³ <https://www.autocove.eu/adas-module-piloting-at-omnia/>

6.4. Success factors

Added value of Auto CoVE 2.0

Auto CoVE 2.0 delivers practical training in electromobility and charging infrastructure while preparing professionals for future challenges relating to the green transition. Students gain real-world experience that enhances their job prospects, while independent car maintenance and repair SMEs – often encountering EVs later than branded service networks – benefit from timely and relevant training. Students in the partner schools also benefit from mobility programmes, which expose them to international education systems and innovative teaching methods, such as virtual reality-based training. The project coordinator reports that this fosters broader perspectives and readiness for a global job market.

By disseminating course materials – developed collaboratively by education and training providers, researchers, and industry players – through the Electude International platform to 70 countries, and in alignment with broader strategic goals for the green transition in the automotive sector, Auto CoVE 2.0 has the potential to contribute to the creation of a Europe-wide, and even an international, skills ecosystem. From the project coordinator's perspective, the early integration of training courses into the partner schools' curricula, coupled with Auto CoVE 2.0's targeted support for independent car maintenance and repair SMEs, is the first important steps towards achieving this long-term impact.

In summary, Auto Cove 2.0 aims to achieve the following benefits:

- **Students:** Enhanced skills aligned with future automotive careers, making VET more attractive.
- **Teachers:** Acquisition of new competencies in EV technologies and digital learning platforms, supporting professional growth.
- **Companies:** Access to a workforce trained in the latest technologies, crucial for competitiveness.

The project adds value to several EU strategic initiatives. It supports the European Green Deal by enabling the green transition through training in EV technology, including content on battery disassembly and material recycling. It aligns with the EU Digital Strategy by equipping students, teachers, and workshop staff with essential digital skills, and contributes to the Net Zero Academy by promoting lower-emission transportation solutions.

According to the project coordinator, all the course development activities are closely linked to the automotive sector's real needs, in line with the Pact for Skills. Similarly, the project mirrors the objectives of Blueprint Alliances, focusing on future skills and industry collaboration. By identifying skills gaps and providing new educational content, Auto CoVE 2.0 addresses the Communication on Attracting Skills and Talent, helping to bridge the gap between education and employment. It also supports Industrial and SME Strategies by offering micro-credentials on urgent topics with the aim of allowing small businesses stay competitive.

The objectives of Auto CoVE 2.0 align with the Union of Skills initiative, which aims to address skills gaps and enhance lifelong learning across the EU. The project focuses on providing tools to two main target groups: vehicle sector teachers at EQF levels 4-6 and employees in the vehicle repairing and selling sector to reskill and upskill their know-how. The project is creating 13 technical and 2 sales-related study modules and 10 teachers' courses, which contain readily made teaching and learning material on EV technology, hybrid vehicle technology, hydrogen vehicle technology, and ADAS technology. None of the content created has existed in any curriculum before. Thus, Auto CoVE 2.0 supports the acquisition of new skills among the project's target groups. Even though the material is built on three different levels – basic, advanced, and specialist – teachers start from the basic levels to upskill themselves. They must study the content first and only after that will they be able to teach it to their students. This approach aligns with the Union of Skills' emphasis on regular upskilling and reskilling to keep pace with evolving economies and technological advancements

Potential for sustainability, scalability and transferability

The project supports regional development by contributing to smart specialisation strategies and building a strong skills ecosystem in the automotive sector, notably through the Collaborative Development Workshops engaging educational institutions, industry representatives, public authorities, and social partners. Industry stakeholders are involved in skills-gap analyses, host student mobility opportunities, and help align VET curricula with emerging sector needs. Public authorities assist with regional dissemination efforts, and cooperation with educational institutions ensures teachers remain updated on electromobility trends. The Collaborative Development Workshop model is regarded by the project coordinator as forming a "knowledge triangle" in emerging automotive technologies, linking education, research, and innovation, to prepare a future-ready workforce and enhance sector competitiveness.

Auto CoVE 2.0's educational content is designed to be replicable, scalable, and transferable. Practical training modules are designed for easy adoption across different countries, supported by translations into nine languages. The collaboration model between industry, education providers, and public authorities has the potential to be applied across various sectors facing technological transitions, according to interviewees.

The project's wide-reaching dissemination strategy will distribute deliverables for free for five years through an international platform reaching 70 countries and 4,000 technical schools. Dissemination through Electude International and an OER platform further boosts its accessibility and impact.

For financial sustainability beyond Erasmus+ funding, the project will offer study modules and teacher courses as micro-credentials, particularly aimed at SME companies. This strategy provides a revenue stream to maintain activities after the project's formal conclusion. In addition, each consortium partner contributes 20% self-financing to the project, reflecting a shared commitment to success.

While the long-term sustainability of the consortium needs further planning, efforts will be undertaken to integrate project outcomes into NQFs, providing a legacy for education and industry.

6.5. Overall impact and lessons learnt

Auto CoVE 2.0's greatest achievement lies in its structured educational concept, which transforms partner expertise into comprehensive learning opportunities for students. This ensures that students will be prepared for future challenges in the automotive sector.

Furthermore, the project coordinator and consortium partners interviewed value Auto CoVE 2.0 as a forward-looking initiative in vehicle technology education, with the potential to position it at the forefront of curricular innovation in this rapidly changing field.

Through skills gap analysis and sustained dialogue with the automotive sector, the project can ensure that educational outputs meet real-world demands. Among its key achievements are the Collaborative Development Workshops, where educators, industry representatives, and policymakers jointly create and evaluate educational content. The project's innovative cooperation model between secondary and tertiary education providers and industry partners ensures a flexible, relevant, and future-proof approach to training, combining theoretical and practical strengths to deliver comprehensive qualifications.

"What I found most innovative in our project is the collaborative development method. We have a steering committee with one project manager from each partner and one technical key developer. Additionally, developers meet five times during the project, every six months, for three full days. During these meetings, they present the content they have created, teach it to each other, and evaluate it. This method involves secondary level teachers, university teachers, and business representatives gathering for three days to share and evaluate their work. Business representatives also present the most acute issues in their company concerning vehicle technology, including the newest and most difficult repairs. This rare cooperation between these three groups is something I am really proud of."

Auto Cove 2.0 project coordinator

7. Care about IT

7.1. About Care about IT

Background information

- **Project name:** Care about IT
- **Duration:** 2023-2026
- **Project call year:** 2022
- **Project status:** Ongoing

Care about IT is a CoVE led and coordinated by Stichting Noorderpoort, in the Netherlands. It involves three other countries (Italy, Finland and Estonia). Project partners include universities, VET providers, healthcare companies/providers and IT companies.

Objectives of the CoVE project

The main objective of the Care about IT CoVE project is to combat the growing shortage of healthcare workers due to an aging population. Care about IT aims to achieve this by looking at opportunities and challenges across the countries they work in, to combine knowledge and experience to 'future-proof education in the care sector' through (re) education and exploration of new IT utilisation. Closing the widening gap between demand, availability and IT solutions.

The Care about IT project aligns with EU policy, Erasmus+ and the VET sector in the following ways:

- **EU Policy:** The CoVE project complements the implementation of the following other EU programmes with similar goals including: the Pact for Skills and Care4Skills. Care about IT partners use the EU skills framework and GreenComp, where appropriate to guide best practice. The European Green Deal strategy is a key focus in the VET schools, measures implemented include travelling as green as possible and seeking to work as digitally as possible.
- **Erasmus+:** Care about IT strongly aligns with the Erasmus+ priority of Digital Transformation, through their integration of VR and exploratory work on AI. They embed 21st century skills in their micro credentials, have partners developing an app and students creating a game to innovate learning experiences. Care about IT is also connected to another CoVE 'EUVECA' as they are in healthcare with a partner organisation in The Netherlands.
- **Vocational Excellence Sector:** This CoVE combines regional excellence with international cooperation and industry, IT innovation with sharing knowledge in VET. Care about IT exchanges students, staff and experts for enhanced learning experiences, sharing knowledge through a European platform of Vocational Excellence in HealthTech. Through work-based learning, online lessons, working with industry and policymakers, they seek to ensure the education delivered together is up-to-date, and accessible for all.

7.2. Activities of Care about IT and skills developed

Activities covered

Care about IT work with a range of partner organisations within each country to aid their activities. These partners vary country to country but include organisations that promote upscaling and facilitate public and private partnerships with VET schools and/or Universities of

"It is nice you can be part of making the change for the future."

Project Coordinator

Applied Science. Learning networks are developed so individuals and organisations do not have to reinvent the wheel and can learn from past experiences. The overall motivation to be a part of this CoVE is, that all partners see the problems coming with the lack of personal in the healthcare and the wish to become more independent as a patient of healthcare.

The activities can be summarised as follows:

- **Teaching and learning:** The project develops micro-credentials and innovative educational programmes. During development phases care about IT provides monthly workshops for teachers to connect, share best practices, and learn from each other.
 - Care about IT have tested some simulation training in Estonia. AI is being investigated for use in education. VR is already used in some of the schools in the CoVE, inclusive of Tallinn Health University of Applied Sciences, at Turun ammatti-instituutti, at DCTerra and at Noorderpoort. Students of Creative Media and Game Technology at the Hanze University of Applied Science developed a game for Care about IT students.
 - APRO, one of the Italian consortium partners was interested to be involved particularly for the development of new teaching modules including micro credentials, driven by the need to upskill their healthcare workforce to be at a more advanced level in line with other EU countries. They are working to get these micro credentials formally recognised regionally and then hope for nationally.
- **Cooperation and partnerships:** The project involves collaboration between education and industry partners, and international cooperation.
 - CoVEs in every partner country follow the same structure with a VET school and a university of applied sciences working in partnership with organisations in the care sector including elderly care homes, hospitals and IT companies specialising in health tech.
 - Network Zon, a project partner in the Netherlands, is developing an app for reciprocity where people and organisations across the network can work collaboratively and sustainably. Once tested Care about IT hope to roll it out in all partner countries.
 - For less advanced healthcare like in Italy, cooperating with European countries was a huge driver for taking part, learning more from best practice while bringing their own experience using a unique curricular, for example nurses learn only at universities and there is no VET school or high school.
- **Governance and funding:** Governance in the partner countries are organised separately but in a similar format by all countries using the EQF rules. For example:
 - The Netherlands have a governance and funding organisation connected to all the healthcare education in the Netherlands, the VET and University of Applied Science help with the organisation of internships of all students.
 - Estonia has the Minister of Social Affairs connected. In Italy they work with their own governance and have good relationships with government as they have a strong network and track record in working on European projects.

Skills developed

There are a multitude of skills developed in the Care about IT CoVE, highlighted below:

- **Transversal skills** are valued to facilitate cooperation and teamwork between learners in the health and IT sectors in a professional setting. Hackathons create space for these soft skills to be developed, on both a national and international stage in teams from different sectors and with differing demographics i.e., age. These skills are key as health and tech sectors evolve over time, so developing adaptable skills are crucial. Care about IT students participate together in an innovative all-day international online hackathon to solve challenges and develop transversal skills through critical thinking

and teamwork. These skills are essential for using technology effectively in healthcare. In March 2025 150 students from the four partner countries worked across 2 days on 10 challenges through challenged based learning. At the end of the second day the students showed their solution to an international jury which commented on the solution the students provided. An Estonian team secured first place with a solution focused on reducing and reusing hospital waste.

- On the promotion of **lifelong learning skills**, Care about IT consider all the EU recommendations and content in the Lifelong Learning Framework. Many, particularly noted in Italy, arrive at healthcare nurses and assistance jobs after another career, showing the importance of this. Care about IT use the framework, but especially the 21st century skills in making the micro-credentials. But also, in their WP 8 recruitment and Guidance. They work on citizenship as part of training paths but also use mathematical science, technology and engineering in the Beta Tech Mentality model (BTMM). They will train in the beginning of next year people in BTMM. Key competences like, digital, entrepreneurship and personal, social and learning to learn are examples in their micro-credentials.
- **Occupation-specific skills** are developed as nursing students have fixed job specific parts that are important to learn, and it is key IT students are aware of them, if they are to work in Healthtech.
- **Digital skills** are highly relevant, as the focus of the CoVE is on upskilling digital skills for healthcare professionals, making participants 'digital citizens'. DigiComp framework is used, by using it to evaluate some aspects of skills improvement. Noting that we are all at some point in our lives also patients, so this CoVE strives "to make people more aware of how digital devices and technology is part not only of our professional life, but of our entire life." (Project Partner, Italy)
- **Language skills** are developed in the international hackathon as presentations of work are in English. For contributors it is moving to see young students practising their English language skills which may not be used to used day to day and may present challenges, to overcome, for example on what the right words are. "We are not only building professionals but citizens" (Project Partner, Italy).

Aligning with the Union of Skills Communication, Care about IT is developing six micro credentials regarding the 21st century skills and is working to integrate them into Health Tech curriculum. The micro credentials are also implemented in LLO (Lifelong Learning) for reskilling and upskilling. In the micro credentials there is also awareness of AI and the use of it. Care about IT also train teachers to work with the Beta Tech Mentality model in Healthtech and try to change education in such a way that they train future professionals.

7.3. Results expected and achieved

Contribution to the development of qualifications

Care about IT is developing six micro-credentials. The project partners in Finland are working with the EU to get these micro-credentials recognised at the EU level. The project coordinator and a Finland representative attended several workshops of the European Digital Credentials for Learning, which used the Europass wallet. The modules are to be developed will be translated into each CoVE language and then made publicly accessible. Each partner country is taking lead of a different part of the CoVE micro-credential development:

- Italy: Creative and critical thinking
- The Netherlands: 21st century skills
- Finland: Introduction to Healthtech
- Estonia: Multidisciplinary skills

No new formal qualifications have been introduced at the national level in any country thus far. The focus is to develop six micro-credentials but Care about IT is also looking for opportunities to have qualifications on Healthtech in future. But in each country, this is different as for example Finland they already have this. The existing qualification framework in the Netherlands is challenging and sometimes too rigid, so Care about IT would like it to be updated. In the Netherlands the qualifications framework has just changed, but there still a lot to do. Care about IT is discussing with partners and persons who work in the qualification structure to try and influence decisions, but this is something where Care About IT only can talk and need buy-in from stakeholders with the power to change.

In Italy the project partners have a strong relationship with regional government which validates the healthcare assistance course. There is also a national government structure, within which each region can customise the pathway a little. They are working to get the competencies and skills in the micro credentials formally recognised, this is a layer of bureaucracy, but a representative from the Italian consortium partner APRO feels it is important to the long-term value and sustainability of Care about IT in Italy. The outcome will open the potential for similar in other professional qualifications, across regions and then national level.

Contribution to enhancing the quality and attractiveness of VET

Working as a CoVE has enabled the establishment of stronger partnerships with key stakeholders by having budget and time built in for transnational connections. Upwards convergence has thrived in this CoVE project as each country has brought different expertise and experience to the project, helping advance different parts. Partnership collaboration offers an opportunity to observe practices in other countries and identify beneficial lessons that enhance the quality and attractiveness of VET across regions and nations.

For example, in November 2025, teachers from each partner country will participate in cross-country learning to understand Italy's recruitment system and how it guides students and learners towards vocational education and training. Teachers take part in exchanges like this to learn from each other.

This CoVE also works as a bridge between healthcare and IT students, which historically have not mixed in formal education, which is seen as innovative. The focus not only on students but professionals that want to update skills.

'Challenge based learning' is happening in all countries and it evidenced well in the hackathons, where participants are given stakeholder problems, which is now being considered as a method to be used in the wider curriculum development.

Some country specific examples are provided below:

- Valuable insights have been gained from **Estonia** regarding their innovative digital teaching methods that enhance student skills and experience of VET. Nursing students from the university of applied sciences collaborate with IT students from the VET school.
- **Finland** has achieved excellent results within this CoVE due to long-term efforts in IT and healthcare. Finland has already worked for 10 years in the field of Health Tech by the IT study. They work with a dedicated team of two IT teachers combined with 2 HealthCare teachers. They work together on the education of these two fields and have skills competitions on this subject already for a few years. Finland's way of working would be a good example to implement everywhere³⁴. The leading organisation in Finland, City of Turku, have a good reputation in the territory as they have collaborated on a lot of European Projects, this trust goes along way and the possibilities are there for increased buy-in from stakeholders.

³⁴ See [Welfare Technology - Taitaja 2024](#) for more information

- In the **Netherlands**, there is extensive collaboration with existing programmes and events focused on health education and healthcare workers due to a shortage in this sector. National programmes aim to address and improve this situation. Efforts include connecting with preparing schools for VET or universities of applied science, as well as participating in exhibitions to showcasing the potential future of work. The Netherlands has numerous healthcare and technology webinars, congresses, and events. These occasions provide opportunities to network with relevant stakeholders who are not project partners – “*we make a lot of noise*” (Project Coordinator). In some of the other partner countries different key stakeholders are just starting to work together, whereas the Netherlands has an extensive history of working together. The Netherlands has a strong healthcare network at all levels, facilitating connections. The governance and funding partner (Netwerk Zon) here is developing an app for reciprocity where people and organisations across the network can set their goals and work towards achieving them collaboratively and sustainably. Tested in the Netherlands, this app leverages the existing network to identify key actors. In partner countries, regional connections are harder to establish due to the lack of existing networks. However, effective project leadership in Finland has helped bridge this gap. Care about IT is currently updating their website to highlight all CoVE's for better national and transnational collaboration. They hold biannual online meetings with international partners. In the Netherlands, universities of applied science collaborate with Care about IT to avoid overlap in their work, focusing on cooperation rather than competition. For example: Students of Creative Media and Game Technology of the Hanze University of Applied Science made a game where a Care about IT nurse students can try to work on his social interaction with the patient/client and use technology (welfare/health) to get more time to work with the patient/client. We want nurse student to let them know that technology is not taking over their work but can help them to interact more with the patient.
- In **Italy**, there is a struggle to get VET seen on same level as traditional higher education, with healthcare. Trying to shift the dial to attract more people first entering the workforce is also major for Italy to overcome.

7.4. Success factors

Added value of Care about IT

Partner organisation benefits

The most significant benefit for participating organisations is improved collaboration, making it easier to find each other. Companies in the Care and/or IT sectors can attract the right people when facing problems on a national and international level. Student involvement in businesses is increasing. The reciprocal app will connect people and organisations with projects that they may not otherwise know about. The CoVE project has helped the Care about IT team build and maintain strong partnerships they now rely on.

Wider stakeholder benefits

When developing micro credentials, Care about IT provides monthly workshops for teachers to connect, share best practices, and learn from each other. This has been conducted internationally, and they are considering additional activities at the national level. Additionally, they have launched a teachers' exchange programme, where teachers visit all four partner countries, facilitating a two-way exchange of different perspectives when it comes to teaching, whilst also networking.

Participation in the Care about IT CoVE enhances students' understanding of healthcare technology. Previously, education in the care sector evolved slowly; now, students gain the most from this shift. In the long term, companies benefit by having better-prepared employees, as Care about IT addresses key educational gaps, identified by employers themselves. As teachers adapt to new methods, they also need ongoing learning, which can be challenging.

For companies' key benefits lie within increased stability in national and international networks, and space to present activities and for cooperation across the industry and with educational providers including with teachers. Suggestions for what students' study, potential influence over micro credentials. Interviews at start of project, gathered information from companies on what they think future professionals should know.

Contribution to regional development strategies/ecosystems

Care about IT collaborates with the Centre of Teaching and Learning and regional hubs in The Netherlands. Their efforts are expanding regional ecosystems, particularly through the Health Hub, where students innovate and develop creative thinking skills.

One advantage for the sector is that when students gain knowledge beyond what is taught in school, it creates opportunities for innovation and creative thinking, which ultimately improves patient care quality.

International benefits to vocational excellence

Observing the practices of other countries, both positive and negative, provides valuable insights. Engaged individuals from different nations can often assist stakeholders who are resistant to change by presenting concrete examples where such changes have led to improvements – *"Looking in each other's kitchen"* (Project Coordinator).

It is important for IT students to understand the health system and users to ensure health tech being developed is made with the end user in mind, the CoVE provides a space to bring IT students closer to the end user, which is beneficial in patient and nursing safety and reliability.

"For the jobs and the skills of the future, the healthcare education system is not so technology focused. So, I think this is really an improvement. Also, for the future ... well if you look at Europe, our population is getting older. So, to be able to give the same kind of care we need a lot of technology in it and people developing that need to be able to speak the same language, right? The health people and the technology people. And I think this is something that in this project, really comes together"

Education and Training Partner, the Netherlands

Potential for sustainability, scalability and transferability

Sustainability

At present, it is difficult to determine whether the Care about IT project will achieve financial sustainability without Erasmus+ funding. However, there is an opinion that once the network they are currently building becomes sustainable, it may pave the way for financial stability. The reciprocity app being developed by Netwerk Zon is a key method to promote long term network sustainability.

There is a general agreement that the tools and methods developed by Care about IT should become part of the regular education systems on national and regional levels, both the modules and the hackathon approach, this requires buy-in from relevant stakeholders, so it become a normal part. A long-term goal is to get the micro credentials formally recognised nationally, which will carry weight and importance increasing potential for sustainability. In the short term, Care about IT intends to extend the Cover project.

Scalability and transferability

The integrated networking and methods developed within the CoVE model allows for scalability and application in various contexts including other sectors. Additionally, the development of materials will offer opportunities for replication and potential financial sustainability. If you have a starting point, then these can be adapted to different contexts depending on individual needs.

Challenge based learning that is typically seen in other disciplines, in healthcare is less common, this has been piloted successfully in Care about IT, receiving positive reception from teachers and learners across partner countries.

Effective practices regarding the collaboration between higher education institutions and secondary vocational education and training programmes highlight the importance of maintaining opportunities for applied research. Scale of potential impact is greater in partner countries such as Italy, where they are still working to improve social views on VET on the same level as HE.

7.5. Overall impact and lessons learnt

Networks are a key part of Care about IT's impact. Building partnerships especially across countries takes time to develop but once it has then the network impact is invaluable and leads to great collaborative results like the hackathons and teacher exchanges. A key aim of the hackathons is to create a 'How to' guide which regional and national partner organisations can use to reproduce similar events in future, widening their impact further. Gaining international collaboration and experience is an invaluable asset to widening impact of Care about IT for students and teachers. This includes the promotion of mobility and the increased understanding of different cultures and accepting different ideas.

The development of micro credentials has the potential to have far reaching impact once formally recognised nationally, as once developed they will then hopefully be used to update education curriculum.

The project is ongoing, but so far, it has normalised the involvement of teachers, making the CoVE growingly independent of the project coordinator and able to function without constant oversight.

"We try every day to do it better than we did the last days."

Project Coordinator

One notable outcome is the shift in perspective that technology is not an isolated subject but integrated into all aspects of work and education. It has broken down the barrier for healthcare students and teachers to work with IT students and teacher, bringing Healthtech into focus including where you can study and work in Healthtech.

The anticipated outcomes and overall impact of the project includes alleviating the burden on healthcare professionals, enhancing patient autonomy, and fostering a more progressive attitude towards the integration of technology in healthcare.

8. CATALYST – European VET Excellence Centre for Leading Sustainable Systems and Business Transformation

8.1. About CATALYST

Background information

- **Project name name:** CATALYST – European VET Excellence Centre for Leading Sustainable Systems and Business Transformation
- **Duration:** 2022-2026
- **Project call year:** 2021
- **Project status:** Ongoing

CATALYST is a CoVE project led by the Institute for Research in Environment, Civil Engineering and Energy (IECE), a private research institute based in North Macedonia.

The CATALYST consortium consists of 16 partner organisations from North Macedonia, Germany, Austria, Portugal and Greece. Three partner organisations are involved by country as well as a transnational umbrella association for sustainable development. The consortium has a balanced mix of educational organisations, NGOs and business organisations. The consortium is enhanced with 40 associated partners, which besides the 6 core countries, come from 11 European countries: Finland, Lithuania, Netherlands, Slovenia, Poland, Bosnia and Herzegovina, UK, Albania, Serbia, Spain and Cyprus.

Objectives of the CoVE project

The CATALYST CoVE is envisioned as a central hub and catalyst for sustainable business transformation in Europe. It is intended to serve as the foundation for a collaborative business community focused on driving sustainable, resilient, and equitable futures for all. The main goal is to give support, create an educational offer to tackle personal and organisational development, and to embrace transformation in SMEs, inspiring them to re-design their business models, co-creating and sharing between educational and business organisations. The specific goals of the CoVE are the following:

- Enable and inspire SMEs to rethink and redesign their business model addressing sustainability from an organisational, social and economic perspective
- Have an advisory role in policy creation and adaptation
- Provide high quality knowledge and skills which are relevant and applicable for professionals, SMEs and students
- Facilitate cooperation between key stakeholders to enhance the ecosystem and improve the visibility of upskilling best practices via the CATALYST Network³⁵

The national CoVEs established for the project are tailored to local contexts, and extend this vision, adapting offerings to meet specific regional needs and target groups, in line with the national S3 (Smart Specialisation Strategies):

- The national CATALYST CoVE in **Austria** puts its focus on sustainability in tourism, emphasising the sector's growth and the need for eco-friendly practices. Additionally, the CoVE aims to target entrepreneurs addressing low entrepreneurial activity and the need for concise training in sustainability practices.

³⁵ <https://projectcatalyst.eu/wp-content/uploads/2024/12/Catalyst-Prospectus-Magazine-1-1-ISSN-1.pdf>

- In **Germany**, the CATALYST CoVE focuses primarily on SMEs, particularly in the food, textile and ICT sectors. The aim is to facilitate sustainable change, particularly for traditional operating companies.
- The selected industry in **Greece**, manufacturing, contributes significantly to the economy but faces challenges such as global competitiveness, innovation, and investment and is therefore put into the focus for the national CATALYST CoVE in Greece.
- CATALYST CoVE in **North Macedonia** addresses the national need for sustainability and business education. The selected industry, construction, is initially targeted due to legislative requirements and its significant role in the economy.
- The selected industry in **Portugal** is the Moulds and Plastic sector, where the CoVE focuses on SMEs within this industry. Portugal's Moulds Cluster is a significant global player, ranking third in Europe and eighth worldwide for plastic injection mould production.³⁶

It is intended that the CoVEs will be 'catalysts' on the national, regional and European levels, 'enabling' change and 'inspiring' the transformation of individuals and SMEs toward more sustainable systems and societies.

CATALYST contributes to realisation of the European Green Deal and the new Industrial and SME Strategies. The project aims to strengthen the sustainable competitiveness of professionals, students, and SMEs. The project fosters innovation and applied knowledge in approaches to learning and tailor-made VET programmes to contribute to a greener and circular European economy.

8.2. Activities of CATALYST and skills developed

Activities covered

The CATALYST CoVE provides tailor-made courses, resources, services, and research initiatives, as well as a network supporting sustainable business transformation to equip organisations and individuals with the knowledge and skills necessary to create lasting change towards a more sustainable society³⁷.

The main project outputs are:

- **Teaching and learning activities:** The goal is to co-create and disseminate applied knowledge inspiring business-education partnerships. At least 70 courses should be developed for EQF levels 4 to 8 on the topic 'Leading Sustainable Systems and Business Transformation'. Alongside these courses, 8 specialisation courses (covering topics such as entrepreneurship in green business or sustainable finance), are being developed, to allow learners to delve more deeply into sustainability-related topics through a combination of courses and applied research projects. Other complementary learning opportunities are proposed including coaching sessions and both individual and group consultations.
- **Cooperation and partnerships:** The CATALYST Network platform facilitates communication, collaboration and networking supporting the CATALYST community of stakeholders for joint problem-solving on key sustainability issues. Applied research projects will also strengthen cooperation between SMEs, education providers and research institutions on sustainability related topics in Europe. Additionally, a dedicated magazine connects practitioners within the sustainability community, offering a space to share insights, experiences, and best practices.

³⁶ <https://projectcatalyst.eu/catalyst-centre/>

³⁷ <https://projectcatalyst.eu/wp-content/uploads/2024/12/Catalyst-Prospectus-Magazine-1-1-ISSN-1.pdf>

- **Governance:** Project meetings are organised, during which partners present their progress, challenges and lessons learned throughout the year, with the aim of continuous improvement³⁸.

The first half of the project focused on developing activities and the CoVE is now in the implementation phase reaching out to the target groups and scaling up the activities for the members of the network.

Skills developed

The CATALYST CoVE addresses three levels of skills development, the systemic level in order to lead sustainable systems, the organisational level in order to create sustainable brands and the personal and interpersonal level in order to embrace sustainable growth. The following skills are developed by the CoVE:

- **Green skills:** The courses focus particularly on sustainability and the circular economy including digital sustainability and sustainable behaviours.
- **Sustainable business skills:** A variety of courses introduce sustainable development policies and their implications for companies. Topics covered include business transformation, circular business models, green entrepreneurship, data analytics, intellectual capital management and Environmental, Social, and Governance (ESG) reporting and auditing.
- **Transversal skills:** Some courses focus on personal development and organisational growth, well-being at work, change leadership and teamwork.

Even if the needs of the target industries were taken into account in the design of the courses, the courses developed by the CoVE do not address specific industries; rather, sector-specific examples are included in the case studies as part of the training.

The goal is to design 70 courses across 8 different fields, all of which will be available on the same platform. The platform is already operational and open to everyone, most of the courses are already available and the material created should be publicly accessible and free at least until May 2026, the end of the funding period. Various partners from the consortium have contributed to the design of these courses.

The courses are aimed at VET students as well as professionals from SMEs, and public administration, though teachers and trainers can also participate. Currently, there are 500 learners on the platform, and the ultimate goal is to reach more than 1,500 learners³⁹.

The national CoVEs are currently trying to disseminate the courses among VET providers, SMEs association and Chambers of Commerce in their countries to obtain feedback. In Portugal, the CoVE is encouraging pilot companies in the plastic industry and students to participate in the courses. The German CoVE is also starting to promote the courses among the target groups while the Greek CoVE is organising meetings with various stakeholders to promote these courses.

The GreenComp framework was used for the courses focusing on green skills while the EntComp framework was used for the courses focusing on entrepreneurship. These skills frameworks were also employed in an extensive assessment of the skills needs of SMEs which then informed the development of these courses.

Some innovative services are being offered or will soon be available, to complement the courses. These include mastermind sessions to encourage collaboration between SMEs stakeholders as well as self-assessment tools, applied research projects and coaching offers.

The Sustainable Leadership mastermind series will bring together business and SMEs professionals in a flexible format depending on participants' availability. The sessions are

³⁸ <https://projectcatalyst.eu/fourthprojectmeeting/>

³⁹ Interview – Project coordinator

designed as a practical space for peer-to-peer exchange, where participants can bring real business challenges, explore partnership opportunities, and co-create solutions. The goal is to generate actionable insights and foster collaboration through shared experiences⁴⁰.

The project aims to combine skills development with practical knowledge encouraging learners to apply these skills in real-world situations. To this end, the specialisation programmes include applied research projects that bring students, trainers and companies together. Applications are now open for SMEs to submit business challenges aligned with CATALYST-related topics, and project implementation is expected to start in mid-2025. There is already a high level of interest from SMEs in these business challenges according to some interviewees⁴¹. The circular economy topic, for example, is of particular interest to German stakeholders⁴².

A range of coaching services is being developed including programmes designed to help companies rethink their business models while some of these coaching offers focus on well-being and sustainability. In addition, individual and group consultations are available for participants who have completed intermediate or advanced courses⁴³. These sessions cover topics such as the development of circular business models, the measurement of circular economy KPIs, or provide tailored consultancy for managers and specialists on circular design strategies.

The third issue of a magazine free of charge offering various stakeholders' perspectives on the topics of sustainability and management is currently being finalised. This promotes a holistic approach to learning based on active engagement and fostering a community among learners.

8.3. Results expected and achieved

Contribution to the development of qualifications

The courses cover EQFs levels 4 to 8 with different levels of difficulty. The EQF was used by the CATALYST course design team as a reference framework in order to define and harmonise the learning outcomes of the courses across different countries.

The CoVE has developed its own certificates of attendance for the CATALYST courses. Learners of these courses are informed of the workload and learning outcomes. While there is no external body to certify the courses, the project is discussing potential validation processes. As the CoVE does not deliver recognised certification, this raises questions regarding the attractiveness of these courses for learners, given the wide range of learning opportunities already available on the market⁴⁴.

The approach to qualifications is primarily considered on a national basis by the CoVE partners. While discussions are ongoing regarding the recognition of learning outcomes for students, the decision ultimately rests with the partner organisations. Such recognition can only be granted by partners that are awarding bodies, who may decide to recognise participation in these courses for their learners. As there are currently no qualifications in some areas such as the circular economy, certain programmes could be certified at a national level at a later stage.

One potential solution would be for the courses certified to be certified as micro-credentials by the higher education institutions that are partners in the project. Another option would be to certify the courses related to specific professions by professional bodies, such as for human resources related courses.

⁴⁰ Interview – Project partner (company)

⁴¹ Interviews – Project partners (NGO and university in Greece)

⁴² Interview – Project partner (NGO)

⁴³ Interview – Project coordinator

⁴⁴ Interviews – Project partners (NGO and university in Portugal)

Contribution to enhancing the quality and attractiveness of VET

The courses were developed in collaboration with companies from the outset to ensure they aligned with industry expectations. The universities involved in CATALYST, supported by all the partners, conducted a skills mapping exercise to gain a better understanding of the actions and needs of SMEs in terms of sustainability and governance, as well as to identify any skills gaps. This research was conducted among SMEs, large companies, VET providers, NGOs and public institutions. The results of this analysis informed the design of the CATALYST courses.

Several difficulties were mentioned by the stakeholders such as challenges to acquire the necessary digital skills and tools for sustainable practices, lack of understanding about options for financing, return on investment and greenwashing, the misleading use of green marketing which can make it difficult for companies to differentiate themselves and make a genuine impact. Proposed solutions identified to support professionals and organisations in their green transformation included educating for sustainable development, managing intellectual capital, increasing dialogue between the academic and business communities, raising public awareness about sustainable practices, and implementing digital transformation to support organisations' green transition.⁴⁵

CATALYST promotes CVET programmes that encourage lifelong learning and upskilling. Operating within the relatively informal professional development sector, the CoVE plays a vital role in promoting excellence in VET particularly after high school or graduation, according to the lead project coordinator⁴⁶. The CoVE addresses a gap in continuing education by emphasising the development of soft skills. While many VET providers focus on specific sustainability topics, there is a need for technical content, such as biodiversity and the circular economy, to be better integrated with transversal competencies. This project highlights the important role of soft skills in advancing sustainability in VET.⁴⁷

The CoVE complements EU programmes such as the Net-Zero Industry which primarily focus on developing technical skills⁴⁸. As demand for green skills grows, CATALYST prepares learners to tackle the challenges of the digital and climate transitions, helping European industries and SMEs to achieve global sustainability goals⁴⁹.

The CoVE label increases the project's visibility, according to the lead project coordinator⁵⁰ and provides networking opportunities, such as using the Forum for Vocational Excellence as a platform, and being part of a CoVE community. The Greek CoVE is collaborating with other CoVE projects in Greece such as Offshore Wind Energy and SERBCoVE to identify synergies, highlight innovations, share networks and ensure the sustainability of their projects. As these projects both focus on energy-related issues, potential synergies with the CATALYST project have been identified, including the potential implementation of some CATALYST courses as part of official VET training in Greece. Meanwhile, in Austria, the CATALYST project has enabled the partner VET provider to expand its cooperation with VET institutions beyond its traditional areas of expertise.

These courses are particularly valuable for CVET students in Austria who want to pursue their studies in higher education as they offer courses at higher EQF levels than those provided by the VET centre, effectively bridging the gap to university, according to the interviews⁵¹. The joint development of some courses by the Austrian university and the Austrian VET provider has fostered a mutual understanding of each other's curricula. This collaboration has provided

⁴⁵ <https://projectcatalyst.eu/wp-content/uploads/2024/12/Catalyst-Prospectus-Magazine-1-1-ISSN-1.pdf>

⁴⁶ Interview – Project coordinator

⁴⁷ Interviews – Project coordinator, Project partners (NGO and university in Portugal)

⁴⁸ Interview – Project coordinator

⁴⁹ <https://projectcatalyst.eu/wp-content/uploads/2024/12/Catalyst-Prospectus-Magazine-2nd-Edition-ISSN-1.pdf>

⁵⁰ Interview – Project coordinator

⁵¹ Interview – Project partner (VET institute in Austria)

valuable insights into the gaps that could prevent VET learners from successfully transitioning to higher education. CATALYST also enables the Austrian VET provider to pilot the delivery of courses with a greater focus on sustainability.

8.4. Success factors

Added value of CATALYST

The 70 courses produced would have been impossible to design separately due to a lack of resources and expertise, according to the interviewees⁵². The various partners brought their experience and expertise of different topics covering many aspects of sustainability and management, and adopted a multidisciplinary approach.

The diversity of the organisations involved, including universities, companies, NGOs and professional organisations, brought a variety of perspectives on sustainability issues. This facilitated the coverage of various EQF levels, from VET to higher education, increasing cooperation between VET providers and universities. Some of the organisations involved were not primarily training providers such as companies, and professional associations and it was beneficial for them to embrace this role⁵³.

The project provides a variety of diverse insights into sustainability, shaped by the different perspectives of the partner countries. For some partner countries, the topic of the circular economy is primarily associated with waste management while for others, it is understood as a broader and more holistic concept. Through this collaboration, the CoVE project aims to foster a more consistent and shared understanding of sustainability across Europe.⁵⁴

A core aspect of the project is the application of the CO-IN© Model (“collaborative innovative model”), which fosters knowledge triangles, and enables collaboration between educational and business organisations⁵⁵. The aim is to generate useful knowledge for SMEs by facilitating collaboration between education and research, for example through applied research projects that foster connections between business and academia. Additionally, the practitioner magazine has been launched to strengthen ties between training providers, research institutes and companies regarding sustainability issues.

The project primarily targets SMEs and professionals who often have little knowledge of sustainability issues and for whom there is already a fragmented learning offer. The developed courses support the implementation of the Green Deal by SMEs stakeholders who are often unaware of the regulatory aspects of sustainability. The CoVE offers flexible and varied learning options such as mastermind sessions which could be particularly useful for SMEs stakeholders who lack the time to attend courses and would prefer more practical, short-term formats. The CoVE is also advancing lifelong learning strategies that support individuals seeking to upskill or reskill, as well as those aiming to enter higher education without traditional study pathways.

Thanks to CATALYST, VET learners at the Austrian VET institution have access to courses designed by international education and training providers. This is particularly valuable for these learners, many of whom come from disadvantaged backgrounds and receive social benefits, which prevents them from spending extended periods abroad.

Potential for sustainability, scalability and transferability

Regarding the **sustainability** of CATALYST, there are some funding concerns to keep the project in a non-commercial manner after the end of the funding period. This includes

⁵² Interviews – Project coordinator, Project partners (company and university in Greece)

⁵³ Interview – Project coordinator

⁵⁴ Interviews – Project coordinator, Project partner (NGO)

⁵⁵ Interview – Project coordinator

maintaining free-access to the platform and the other services provided as well as ensuring that courses are updated on a regular basis.

The years 2025 and 2026 are dedicated to finding ways to sustain the project after the funding ends, particularly with regards to maintaining the platform and the courses and considering how to translate them into more languages. The sustainability of the CoVE would probably rely on a combination of funding sources such as EU and national funding; as well as potentially a small contribution from learners, particularly for more advanced courses.⁵⁶

The national CoVEs are crucial for the survival of the project and for engaging local and national actors. The Portuguese CoVE is planning to study other skills gaps and to advance into new fields through a Skills Observatory project, for which they are associating with other partners to establish a new CoVE. In Germany, the CoVE intends to make the created courses and content available on well-established web platforms in order to create synergies with other training providers. The Austrian CoVE is trying to establish more partnerships at the national level in order to secure the financial and technical support needed to continue the project.

The content developed by CATALYST can easily be shared or uploaded to existing platforms with a good outreach, according to the interviews⁵⁷. For example, learners at other Austrian VET organisations can access the CATALYST courses via the BEST Institute for vocational training and personal training Learning Management System (LMS). The need to translate the courses into the national languages to ensure their dissemination was mentioned in several interviews, as the SMEs stakeholders often do not speak English⁵⁸. Based on the feedback of the users of the courses and their needs, it will be decided which courses to translate and into which languages.

The outputs of the project are easily **scalable and transferable**, according to the lead project coordinator as the courses are very transversal and do not focus on a specific industry⁵⁹. The developed content could then be expanded to additional industries and countries. The applied research project has a good potential to be scaled up to include more companies in applied research⁶⁰.

These courses could equip university students with VET skills, which are crucial for entering the labour market but are not covered by university curricula. For instance, the Portuguese university invites its students to take courses in knowledge management and Environmental, Social, and Governance (ESG) reporting. After the end of the project, the Greek university is also considering incorporating some of the content of these courses into its programmes.

In Germany, the CoVE is in discussion with the Ministry of Labour to explore the possibility of incorporating the CATALYST content into courses for unemployed people. The project could also benefit from including more courses for lower EQF levels, for example, to support learners from disadvantaged backgrounds who are unfamiliar with sustainability topics⁶¹.

The associated European partners are following the progress of the CoVE and will be able to transfer and scale up some of the results in their respective countries. As the CoVE leader is based in North Macedonia, the project also offers the opportunity to work in Western Balkans enlargement countries by contributing to establishing a circular economy hub in the region.⁶²

CATALYST is also expanding its outreach beyond Europe, engaging with stakeholders who might be interested in the European approach to sustainability. The consortium includes one

⁵⁶ Interviews – Project coordinator, Project partners (NGO, university in Greece, university in Portugal)

⁵⁷ Interview – Project partner (NGO)

⁵⁸ Interviews – Project partners (NGO, university in Greece, university in Portugal)

⁵⁹ Interview – Project coordinator

⁶⁰ Interviews – Project partners (NGO, university in Greece, VET institute in Austria)

⁶¹ Interview – Project partner (VET institute in Austria)

⁶² Interview – Project coordinator

umbrella organisation, the Sustainable Development Solution Network (SDSN) which helps extend its reach to a broader international community. For example, stakeholders from Africa have expressed an interest in the mastermind sessions and learners from non-European countries are attending the CoVE courses.⁶³

8.5. Overall impact and lessons learnt

The biggest achievement of CATALYST is to create a broad offer on sustainability-related topics at various EQF levels, according to the interviewees⁶⁴. Rather than targeting specific groups or sectors, the project partners designed 70 courses with the aim of keeping them as open and applicable to as many contexts as possible. Additionally, there is potential for the applied research projects to further enhance the impact and reach of the CATALYST initiative. However, the offer of courses for lifelong learning and regarding sustainability is already numerous and the CoVE faces some challenges to be seen as an entity that adds value⁶⁵.

The focus of the CoVE on SMEs and professionals is much needed. For example, in Portugal, the CoVE offers professionals in SMEs courses that allow them to study while at the same time continuing their professional activity. The developed courses also enable students to develop transversal and practical skills related to sustainability that are sometimes outside of their area of specialisation.

Another significant achievement of CATALYST is facilitating the transfer of knowledge between universities and companies, especially SMEs, according to the interviewees⁶⁶. The ultimate goal is to expand the project's reach to more companies and professionals thereby increasing the number of beneficiaries of these courses. The CoVE is also trying to bring other organisations into the project in order to engage with stakeholders from different geographical areas and organisations.

⁶³ Interviews – Project coordinator, Project partners (company and university in Greece)

⁶⁴ Interviews – Project coordinator, Project partners (NGO, university in Greece, university in Portugal, VET institute in Austria)

⁶⁵ Interviews – Project partners (NGO, university in Greece, university in Portugal)

⁶⁶ Interviews – Project coordinator, Project partners (NGO, university in Greece, university in Portugal)

9. EcOVEM – European Centre of Vocational Excellence in Microelectronics

9.1. About ECoVEM

Background information

- **Project name:** ECoVEM – European Centre of Vocational Excellence in Microelectronics
- **Duration:** 2020-2024
- **Call year:** 2020
- **Project status:** Completed

ECoVEM was led and coordinated by the Technical University of Sofia, Bulgaria. It brought together 21 partners across eight countries (Germany Bulgaria, Italy, France, Spain, Cyprus, Belgium and Norway). Partners in the consortium include vocational education and training (VET) providers spanning EQF levels 3 to 8 and initial (IVET) and continuing (CVET) education providers in institutes, polytechnics and research departments with SME's, industry leaders, trade associations, social partners, and national authorities, policy developers and representative groups advocating for equality and social inclusion (Women in Tech, youth and migrants).

Objectives of the CoVE project

ECoVEM brought together VET centres, polytechnics, industrial associations, social partners to establish a European Cooperation platform of Vocational Excellence in Microelectronics to tackle the challenges of: digitalisation, artificial intelligence, green technologies, gender equality and technology, and the integration of migrants. Specific aspects of microelectronics tackled in the project include (but are not limited to) integrated circuits design, fundamentals of microelectronics manufacturing and design and manufacture of Printed Circuit Board (PCB).

ECoVEM was aimed at building on and complementing the strengths of national VET systems in countries with more-advanced VET and supporting less advanced regions to achieve VET excellence.

The objectives were:

- Networking of CoVEs, industrial and social partners to share ideas, and experiences towards vocational excellence in microelectronics
- To develop innovative VET curricula for EQF 3 to 8 in Microelectronics in collaboration with companies and social partners
- To disseminate microelectronics achievements in digitalisation, green energy, robotics, space technologies and medicine to raise the attractiveness of VET and microelectronics through open days, international schools and competitions
- To ensure sustainable governance at national and EU levels
- To tackle non-discrimination and social inclusion in VET, focusing on the gender dimension of employability in the sector and VET for immigrants.

9.2. Activities of ECoVEM and skills developed

Activities covered

The project brought together a wide variety of stakeholders, including educational providers spanning EQF levels 3 to 8 – covering both I-VET and C-VET – delivered through institutes, polytechnics, and research departments. The consortium also had representatives from industry, trade associations, national authorities and groups representing vulnerable groups

(women in tech, youth and migrants). Experts from industry and research institutes were involved in teaching, also after the project end.

Policy makers were engaged at local and regional level in the case of larger countries (Germany, France, Italy and Spain) whereas in smaller countries (Bulgaria, Cyprus and Norway), activities with policy makers were at national level. Concerning the involvement of VET providers and higher education institutions, "INES", France are C-VET providers and being a branch of Commissariat à l'Énergie Atomique et aux Énergies Alternatives (CEA) are the best example of the link of VET and research: their affiliation with CEA highlights their strong connection to cutting-edge research, making them a model for how VET can be tightly integrated with research and innovation – particularly in support of Smart Specialisation Strategies.

Collaboration between partners involved working closely with universities to co-create educational materials and facilitate the exchange of knowledge. Additionally, there was significant collaboration with industry partners, particularly in Spain and Germany, where they provided practical materials to help apply theoretical knowledge effectively.

Project partners conducted the following activities:

Teaching and Learning:

- Providing people with labour market relevant skills, in a lifelong learning, continuum approach. Combining offers of iVET, with offers of cVET (for upskilling and reskilling) that are informed by skills anticipation.
- Developing innovative curricula that focus on technical skills and competences (1250 hours of VET curricula and short courses for 900 trainees).
- Providing higher level VET programmes and developing flexible pathways between VET and higher education institutes.
- Investing in continuing professional development of teachers and trainers for both pedagogical and technical skills.

Cooperation and Partnership:

- Contributing to the creation and dissemination of new knowledge in partnership with other stakeholders.
- Establishing business-education partnerships for apprenticeships, internships, sharing of equipment, exchange of staff and teachers between companies and VET centres, etc.
- Providing SMEs with technical support, needs assessment, tools and methodologies, as well as tailor-made training to support their offers for apprenticeship and upskilling/re-skilling.
- Developing internationalization strategies to foster transnational mobility of VET learners, teachers, as well as leaders.
- Participation in national and international skills competitions, aimed at raising the attractiveness and excellence in VET.
- Developing "International VET campuses/ academies" for learners in primary, secondary, and VET schools as well as teachers, trainers and leaders in VET institutions, and for people considering future vocational study options.

Governance and Funding:

- Actively engaging in overall national skills governance systems and linking with employment and social policies, at local, regional, national and European levels.
- Making full use of EU financial instruments and funds. These could include the support of education and training actions, mobility of learners and staff, applied research activities, infrastructure investments to modernise VET centres with advanced

equipment, and implementation of management systems to assure the excellence and sustainability of VET organisations and the services they provide.

Skills developed

This project has taken a comprehensive approach to skills development in microelectronics, aligning technical training with the green and digital transitions. It integrates occupation-specific, transversal, and STEM-related competencies to support workforce readiness across multiple sectors, including photovoltaics and electric vehicles.

Occupation-specific skills: The project addressed a broad spectrum of occupation-specific competencies in the field of microelectronics, including design, fabrication, and application. Within the green sector, photovoltaics—classified as microelectronic products—were a key focus area. For instance, INES Plateforme Formation & Evaluation developed 3 training courses⁶⁷ **dedicated to photovoltaic (PV) cell and module fabrication process (EQF 5 to 8)**. These courses are designed to help technicians, engineers and researchers in the industry (upskilling and/or re-skilling for manufacturing companies, engineering offices, research centres) as well as technical and engineering students specialising in material science and microelectronics (and their professors). Two tailored courses (EQF 7 and 8, 14h and 8h respectively) were provided to all staff members of CERTISOLIS (12 engineers and technicians). The project also included tailored training modules on automotive electronics, with an emphasis on electric vehicles.

Green and Digital skills: Microelectronics are essential to the advancement of digital technologies, serving as the foundational components for all digital systems. The project strengthened the connection between green and digital transitions by promoting microelectronics as a core enabler of both.

STEM skills: The training programmes are built on core STEM disciplines, particularly microelectronics. These subjects are considered prerequisite knowledge for participation in the courses.

Transversal skills: The project developed three transversal training courses focused on soft skills, namely communication, teamwork, and project management. These are made available across all EQF levels to support learners' adaptability and employability. An intercultural communication course was designed and integrated into the delivery of the educational material with the intention of reaching a broader non-technical audience.

Regarding alignment with **European frameworks**, the Italian partners responsible for quality assurance explained that key European policies relevant to the CoVE sector were introduced and applied. Notably, the EQAVET framework was implemented to support quality assurance in the development and piloting of ECOVEM courses across Europe.

Regarding **innovative methods and pedagogies**, the project has a dedicated deliverable that outlines the use of various advanced teaching and learning approaches. These include project-based learning, problem-solving techniques, performance-support systems, simulations, and a theoretical introduction to virtual reality. These methods are extensively implemented in the project's training activities, with group-based project work being the most frequently applied. Stakeholders emphasised the importance of a practical approach to learning, which includes ongoing collaboration with the industry. This collaboration helps identify industry challenges and allows for the creation of content based on real-life examples. This leads to more market-oriented learning and encourages enterprises to participate. For example, at Technical University of Sofia (TUS) there are collaborative courses with Bosh Bulgaria, Melexis, AMG Technology. The theoretical teaching is done at TUS, and the practical training in the companies.

In order to **support teachers' professional development**, the project analysed VET teachers' professional situations across participating countries. It looked at societal perception,

⁶⁷ <https://www.ines-solaire.org/en/international/ecovem/>

remuneration, continuous development opportunities, peer collaboration, COVID-19 impacts, and career pathways. Findings are in *“Teachers and Trainers Situation: Handbook to Policy Makers.”* Additionally, a specialised working group was established to identify and address the challenges faced by teachers. Another working group designed teacher training guidelines and organised various professional development events for partner countries. In addition, a train the trainer (ToT) training was organised for building the capacity of trainers to deliver effective training intervention. Feedback reports from the sessions indicate that trainees found the training highly relevant, useful, and well adapted to the specific contextual needs.

With regard to the involvement of VET students and teachers in research activities, one of the main successes of ECoVEM identified by interviewees is the Business-Science-Education (BSE) plan⁶⁸ that was developed and implemented. A positive role of HEIs in the project has been the opportunity provided to trainees and teachers to work on research projects with the researchers from universities.

9.3. Results achieved

Contribution to the development of qualifications

Rather than establishing new full qualifications, the project focused on developing courses that could be integrated as elective modules within existing educational programmes. In doing so, learners stand to benefit from greater choice and specialisation opportunities. For university-enrolled students, the courses are recognised with ECTS credits, while learners outside formal university systems receive certificates confirming their participation and acquired competencies. A Cyprus partner explained that there are plans to develop curricula to integrate microelectronics into secondary education through STEM project-based learning.

A major outcome of the project has been the successful integration of nearly all developed courses into formal curricula, according to the partners consulted. In addition to mainstream education, bespoke training has been designed in response to the specific needs of enterprises, particularly in the field of C-VET. These highly tailored programmes reflect a growing demand from companies for specialised, application-oriented training. One notable example comes from Bulgaria, where the company BOSCH – active in software development for the automotive sector – sought out a customised training programme in microelectronics. In this case, theoretical instruction was delivered by the university, while practical training was conducted directly at the company. The collaboration highlighted the strategic value of industry-specific training in high-tech domains such as microelectronics, according to the partners consulted. For companies, this type of partnership represents an investment in developing in-house expertise and securing a competitive edge. Interestingly, this wave of industry involvement was not initially foreseen as part of the project—it emerged organically. The first company approached the consortium directly, and following successful dissemination efforts, other businesses began expressing similar interest. These collaborations have proven mutually beneficial. They often involve formal agreements and coordination with the management of universities or VET institutions, given the legal and institutional frameworks involved.

All courses integrated into formal programmes are accompanied by the appropriate academic credits and official certification, ensuring they contribute meaningfully to learners' educational and professional development. In Italy, for instance, the minimum quality assurance standards for ECoVEM courses were shared with the National Institute for Public Policy Analysis (INAPP), a public research body of national relevance, under the supervision of the Ministry of Labour

⁶⁸ The ECoVEM action plan for Business-Science-Education cooperation (BSEC) defines the directions and activities for strengthening vocational education and training (VET) in microelectronics as an enabler of upskilling and reskilling, sustainable development, digitalisation and resilience. More information here: [https://ecovem.eu/ECoVEM%20action%20plan%20for%20business-science-education%20cooperation%20\(BSEC\).pdf](https://ecovem.eu/ECoVEM%20action%20plan%20for%20business-science-education%20cooperation%20(BSEC).pdf)

and Social Policies. They used the project as a good practice to be shared at national level to enhance QA in VET courses and facilitate their recognition by using the EQAVET indicators.

In parallel, several countries have begun taking initial steps toward introducing micro-credentials, recognising their potential to support more flexible and targeted learning. However, this process remains complex. For instance, a Spanish partner highlighted significant efforts to accredit courses through micro-credentials within Spain's Vocational Training system, facing a complex and administrative process. The accreditation process, which began in 2021-2022, only received a response recently in 2025, illustrating the slow and complex nature of the process. However, European Digital Credentials are used.

Although the project has not led to the creation of entirely new formal qualifications, efforts are underway - particularly in Cyprus, Bulgaria and Spain - where partners are working closely with national agencies to influence qualification development. However, due to the complexity of legislative procedures, progress remains gradual.

Contributions to enhancing the quality and attractiveness of VET

The project has generated a range of impacts within the VET ecosystems in several countries.

- In **Cyprus**, a microelectronics cluster was established by the project partners to advance the microelectronics sector. This initiative aims to enhance vocational education and training (VET) in microelectronics, which is crucial for the development of this industrial sector. This represents a significant and unprecedented achievement, bringing together academia, industry, and government to address gaps in microelectronics in Cyprus. The effort to create a national Microelectronics Cluster in Cyprus aligns with regional development goals and anticipates securing funding for the cluster. Cyprus partners explained that the project strengthened the role of the Cyprus Chamber of Commerce as a bridge between industry, education, and government, enhancing policy influence and creating stronger networks locally and at the European level.
- In the **Basque Country (Spain)**, the initiative is actively supporting the growth of the Basque Microelectronics Hub. This includes fostering a new public-private collaboration between the regional government and a project partner. One of the key objectives of this collaboration is to create academic chairs in microelectronics and to expand knowledge transfer at the vocational training level.
- In **France**, open days, laboratory visits, and seminars at the *Institut National de l'Énergie Solaire* (INES) have showcased cutting-edge developments in photovoltaics and their applications in the space industry, further underlining the relevance of microelectronics to emerging technologies.
- In **Germany**, the project facilitated partnerships such as the collaboration between German organizations and a French partner company. The German representative highlighted that synergies were explored between stakeholders in the satellite industry and those involved in solar panel technologies. An NGO partner from Germany shared that some participants from migrant background changed their career paths and pursued technical education in Germany after attending the seminars and workshops. The project inspired young participants to seek further learning opportunities as well. Similarly, the German partner organization hired talented young participants following their involvement in the hackathons organised as part of the project.
- In **Italy**, partners explained that the connections of partners with different type of stakeholders facilitate the transferring the impact of the project both at regional but also at national level, as partners work at these different levels. One of the partners noted their collaboration with the national agency for labour market policies, organizing national meetings to involve various stakeholders and facilitate dialogue at the national level. This collaboration helped disseminate project results and influence policy reforms. Additionally, it aimed to facilitate the inclusion of project results in future policy reforms. Another partner, actively involved in the review and updating of the region's S4 strategy

outlined the influence of ECOVEM in this regard. In particular, they explained that ECOVEM project has facilitated the creation of a "skills ecosystem" by fostering collaboration between VET providers and industry partners ensuring that training programmes are aligned with the actual needs of the labour market, particularly in the microelectronics and mechanical engineering sectors.

At a broader level, the project maintains strong engagement with the microelectronics industry and contributes to policy dialogues, particularly in relation to the **implementation of the European Chips Act**. Roundtable discussions organised by project partners in Spain, Bulgaria, France, Norway, and Italy, as well as the establishment of the microelectronics cluster in Cyprus, reflect the project's active involvement in shaping policy and aligning with European industrial priorities. Furthermore, the project's participation in the development of the **European Pact for Skills in Microelectronics**, together with the European Commission, underlines its commitment to international collaboration, industry engagement, and the development of a skilled workforce that meets the evolving needs of this strategic sector.

As part of its broader mission to strengthen VET, the project has contributed to raising the attractiveness and perceived value of VET at national, regional, and local levels. Through a wide range of targeted initiatives, the project has engaged nearly 20,000 participants from diverse backgrounds—including students, professionals, and individuals from underrepresented groups. These activities have aimed to enhance skills, promote inclusivity, and increase awareness of the career opportunities available in the microelectronics and related sectors. Key actions include the organisation of annual Olympiads and competitions, designed to spark interest and excitement among young learners and highlight the relevance of VET in high-tech fields. The project has also supported summer schools and the yearly Computer Space International Festival, which serves as a platform for innovation and collaboration.

Recognising the importance of inclusion, dedicated seminars, workshops, and summer schools have been organised for refugees and immigrants, helping them to integrate into society and build community through shared educational experiences. Efforts have also been made to address gender imbalances in the sector, with a variety of events specifically aimed at encouraging women to explore careers in microelectronics.

The project coordinator highlighted Germany's dual education system, noting its role in introducing dual VET up to EQF level 5 in Bulgaria, with ECOVEM aiding in teacher training. Partners in Cyprus also explained the importance of microelectronics and the challenges faced by small countries like Cyprus in developing this industry and the contribution of the project to building an understanding of the importance (including amongst policy makers) of creating a cluster using local expertise. Collectively, these initiatives contribute to national and regional strategies by improving the visibility, inclusiveness, and perceived quality of VET according to the partners consulted – supporting its evolution as a dynamic and future-ready educational pathway.

9.4. Success factors

Added value of ECOVEM

Overall, ECOVEM has brought benefits to all stakeholders involved, according to the stakeholders consulted, enhancing the quality and attractiveness of VET, promoting inclusivity, and fostering collaboration between education providers and industry partners

ECOVEM has fostered collaboration among vocational education and training providers, industry leaders, trade associations, social partners, national authorities, and policy developers. This collaboration has led to the creation of innovative training programmes, the establishment of microelectronics clusters, and the development of new qualifications. The project has also facilitated the exchange of best practices and the implementation of dual education systems, aimed at enhancing the overall quality and attractiveness of VET.

According to the results of the survey done in the context of the project, students have benefited from the CoVE project through access to high-quality training programmes that are integrated into the regular curricula of participating institutions. The project has also provided opportunities for students to engage in research activities and collaborate with industry partners, enhancing their practical skills and employability. Additionally, the project has promoted gender inclusivity, with increased female representation among course participants.

Teachers have received support for their professional development through training seminars on innovative teaching and learning techniques. The project has also sought to address the needs and motivation of teachers by creating a handbook for policy makers and organizing multiple training events. This is expected to improve the social image, salary, and continuous professional development opportunities for VET teachers. Additionally, teachers positively value the training programme, with very little to no negative answers as laid out in the.

Companies have benefited from the CoVE project through collaborative training programmes that involve both theoretical teaching at educational institutions and practical training at companies. This approach has helped companies address specific training needs and develop a skilled workforce that is responsive to industry demands. The project has also facilitated the creation of strategic partnerships with industry bodies and research institutions.

Potential for sustainability, scalability and transferability

Overall, EcOVEM has demonstrated a range of benefits in terms of sustainability, replicability, and transferability, ensuring that its outcomes can be applied and adapted in various contexts to enhance vocational education and training.

The EcOVEM CoVE has remained **financially sustainable** without Erasmus+ funding. The coordinator explained that six months after the project ended, partners continue to attend monthly online meetings, exchange ideas, and collaborate on technical and financial matters. A partner explained that they are considering publishing a paper on the results of the projects which would contribute to the sustainability of the project. Partners also highlight that there is a sustained demand for high-quality vocational training in the field, which helps maintain the relevance and attractiveness of the project's outcomes to both learners and employers. This in turn facilitates the co-financing of training programmes, as companies and local authorities are highly invested in ensuring that their workforce is continuously upskilled to meet industry needs.

In terms of **project output sustainability**, the courses are integrated into the partners' regular curricula and continue to be available and offered to students. The partners emphasised that the courses should continuously be improved to adapt to new contexts and needs, maintaining their relevance and effectiveness. However, in their view, the theory and technical concepts covered in the courses remain relevant and current, facilitating their transfer to other educational and professional contexts.

Other activities that continue to be carried out include business-science-education cooperation, raising the attractiveness of VET, and collaboration with policymakers, which have become regular practices for the partners in all participating countries. An example of this is the continuation of the Microelectronics cluster in Cyprus and the commitment of national authorities to create a funding programme to support this.

The outcomes of the CoVE project are highly **replicable**, according to the partners interviewed. In their view, best practices in business-science-education cooperation, guidelines for innovative teaching and learning, teachers' training, and activities for raising the attractiveness of VET can be applied in other contexts. Competitions to enhance the attractiveness of VET and collaboration with industry can also be replicated. The coordinator highlighted the benefits of the CoVE Community of Practice meetings where partners discuss and solve problems, and which are a 'great initiative' that can be replicated in other Erasmus+ projects. Italian partners explained that the project is highly replicable and scalable, particularly in the context of Capacity Building in Vocational Education and Training (CB VET). The project's outcomes, such as industry-aligned training programmes, quality assurance mechanisms, and capacity-building

initiatives for educators and trainers, can be adapted to various regional contexts. For example, IAL-FVG's experience in aligning VET with industry needs can be applied in candidate countries for EU membership or non-EU countries, contributing to the development of sustainable and demand-driven VET system.

In terms of transferability, the use of virtual reality for training in dangerous tasks, such as soldering, developed by the technical institute in the Basque Country, is an example of a practice that could be transferred to other sectors, according to the coordinator. The opportunity for secondary VET to be involved in research projects is another transferable outcome. An Italian partner organisation explained that these methodologies could apply to other Blueprint Alliances for Sectoral Cooperation on Skills in which it is involved, fostering connections and creating synergies with local actors in the private sector, particularly in fields such as AI and blockchain.

9.5. Overall impact and lessons learnt

The primary impact of the CoVE project lies in its ability to address emerging challenges and new initiatives, as well as exceeding the original objectives set five years ago, such as its involvement in the Pact for Skills and the European Chips Act. The project fostered a culture of mutual learning, according to the partners consulted drawing from successful models across countries, including dual education systems.

Stakeholders noted that the pilot test and field trial show that ECoVEM's methodology effectively addresses skill gaps in microelectronics. With over 2,000 participants, 42 modular courses (exceeding expectations by 200%), and satisfaction rates above 90% amongst participants, ECoVEM is considered a success according to the partners consulted.

Going forward, the project is expected to contribute to strengthening Europe's microelectronics sector, reducing reliance on other economies for production. Through its activities, the project has contributed to increasing awareness at both the EU and national levels and it has underscored the importance of developing a robust microelectronics industry within Europe to foster innovation and economic growth in the region.

Project partners also highlighted ECoVEM's role in forming strategic partnerships. ECoVEM established 20 new collaborations with European initiatives, industry bodies, and research institutions to ensure the long-term adoption and promotion of resources developed in the context of the project. Four policy briefs were endorsed by regional authorities, reinforcing ECoVEM's influence on vocational education policies. Some partners noted that increased international collaboration among consortium members would have been beneficial but acknowledged the constraints of having to run numerous activities and limited time. Additionally, the role of the project in promoting the female participation in the microchip sector was also emphasised.

However, some partners noted that the diversity of the EU context made it challenging to implement a single-size-fits-all approach, but the work done on a national scale has had a significant impact across Europe. By adapting the CoVE framework to local contexts, partners have managed to create a model that is replicable and relevant across different regions, fostering a more integrated and responsive VET system. This approach has proven to be effective in connecting industry needs with vocational education and training, enhancing collaboration and innovation at the national level, and setting a strong foundation for broader EU-wide implementation.

One of the most notable outcomes for partners is the project's self-sustainability. The training courses developed during the project continue to be delivered and have already been updated for 2025, beyond the project's official end. Furthermore, the established collaborations – with industry, policymakers, other CoVEs, and the European Commission – are ongoing.

Today, all partners remain actively involved. They continue delivering training, and many are now engaged in new national and European VET initiatives in microelectronics. In Cyprus, a

microelectronics cluster – formed through the project partnership – has become a key driver for promoting enterprise development and skills training tailored to the evolving needs of the labour market, according to the partners consulted. Funding initiatives at the national level to continue supporting the cluster are foreseen.

10. EE4M – Engineering Excellence for the Mobility Value Chain

10.1. About EE4M

Background information

- **Project name:** EE4M – Engineering Excellence for the Mobility Value Chain
- **Duration:** 2023-2027
- **Call year:** 2022
- **Project status:** Ongoing

EE4M is a CoVE project led by Montanuniversität Leoben, a university in Austria. The project began in June 2023 and is expected to conclude in June 2027. The project partners are currently finalizing the development of the training concepts and will soon begin implementing them in real-life settings at the secondary, tertiary, and continuous training levels.

It involves 15 partners across 4 countries (Austria, Greece, Italy, Spain). The partners involved include research as well as education and training institutions, professional associations, a company in the mobility sector and a telecommunications company.

Objectives of the CoVE project

The EE4M CoVE responds to the need to re- and upskill engineers across the European mobility value chain – including but not limited to automotive manufacturing – from raw materials to recycling.

EE4M aims to realign engineering education to meet evolving technological, environmental, and social demands, such as changing consumer behaviours, disruptive technologies and decarbonisation needs. It aims to do this through the integration of green and digital competencies in engineering education. The project's specific objectives include:

- the development of European transnational VET platforms for engineering education,
- the promotion of smart and sustainable operations management (OM),
- competence-based learning for IVET and CVET,
- the creation of dynamic skills ecosystems, and
- the advancement of VET teaching environments aligned with EQF levels 4–8.

As such, these objectives support Erasmus+ programme priorities, particularly in promoting transregional skills and knowledge transfer and aiming to support the digital and green transitions, and aligns with the EU's strategic focus on upskilling and reskilling in line with the European Skills Agenda, the Green Deal, and Digital Education Action Plan. It embodies the EU's concept of Vocational Excellence, which emphasises collaboration among education and training providers, industry, and research to generate sustainable and high-impact solutions for regional and sectoral skill needs.

10.2. Activities of EE4M and skills developed

Activities covered

The activities under EE4M are clustered under seven work packages and include the development of VET platforms (WP2), the exploration of competence-based generic (WP3) and specific (WP4) requirements for VET, including through the creation of competence profiles based on industry needs, the development of VET practices (WP5) and the implementation of pilot training for VET (WP6). Work packages 3-5 are organised around the focus areas of:

- Logistics and supply chain management,

- Product development and manufacturing management, and
- Entrepreneurship and industrial marketing management.

Teaching and Learning: EE4M develops modular and blended learning environments to equip learners across EQF levels 4-8 with smart and sustainable engineering skills. Higher education institutions and VET providers together create these modules combining applied research with practical training, particularly in areas such as logistics, sustainable operations, and digital manufacturing. Modules are planned to be tested in close-to real life conditions, using AR/VR tools, simulations, and virtual labs. Industry partners validate relevance and contribute case studies and work-based learning. Teachers will benefit from tailored professional development, including train-the-trainer formats and digital resources. An iterative development process is meant to ensure that content remains aligned with sector demands.

Cooperation and Partnerships: EE4M intends to establish a transnational skills ecosystem by connecting academia, VET providers, industry, and public stakeholders. Participants collaborate through regular coordination meetings, stakeholder workshops, hackathons, and co-creation labs. These partnerships help to ensure training aligns with real-world industry needs and support the recognition of qualifications further down the line. Regional cooperation, for example, between Mondragon University and Instituto Cuatrovientos, or TFO Bruneck and local SMEs, anchors the project in local contexts. The close collaboration between higher education and VET institutions enables vertical curriculum alignment and is intended to allow learners to transition seamlessly across secondary, tertiary, and lifelong learning levels.

Governance and Funding: Governance is led by Montanuniversität Leoben, with structured coordination across all partners and work packages. A management framework is in place to ensure progress, quality assurance, and risk mitigation. Regional VET platforms serve as hubs to facilitate implementation and knowledge exchange. Participating education institutions actively participate in decision-making and planning for long-term integration of EE4M content into curricula.

Skills developed

EE4M envisages a comprehensive skills development framework targeting secondary, tertiary, and continuing education learners. It combines transversal, job-specific, green, digital, STEM, and entrepreneurial competencies. Project partners cite a broad spectrum of transversal skills that is being supported, including critical thinking, problem-solving, teamwork, communication, strategic and leadership skills, decision-making, risk and crisis management, negotiation, emotional intelligence, resilience, and adaptability.

The project emphasises practical expertise in smart logistics, industrial automation, operations management, and sustainable manufacturing practices. While addressing the diversity of mobility sector occupations, EE4M focuses particularly on digital jobs and skills relevant to Industry 4.0 and circular economy models.

Aligned with both the GreenComp and DigComp frameworks, EE4M integrates energy-efficient production, digital twin technologies, AI applications, data analytics, and circular economy concepts into the curriculum. Digital skills covered range from AI implementation and cloud management to cybersecurity, programming, data mining, and digital marketing. Sustainability competencies include systems thinking, sustainable innovation, environmental awareness, and sustainable strategic planning.

STEM skills such as analytical thinking, technology literacy, and coding, as well as ethical decision-making and continuous learning are promoted by the project. EE4M also aims to teach entrepreneurial and innovation competencies to prepare learners for industrial engineering roles.

EE4M employs various teaching methods including problem-based learning (PBL) with company collaborations, blended and hybrid learning, co-teaching between VET and university staff, and activity-based learning. Emerging technologies such as VR/AR for immersive

production line visualisation, digital twins for manufacturing simulations, and AI tools for logistics scheduling and quality inspection are piloted and planned for broader implementation.

10.3. Results expected and achieved

Contribution to the development of qualifications

A central goal of the EE4M CoVE project is to contribute to the modernisation and expansion of qualifications across EQF levels 4–8, with a focus on skills relevant to the smart and sustainable mobility value chain. The project expects to:

- Update curricula for VET and higher education in line with newly identified competence profiles, while aligning competence-based course frameworks with national qualification systems;
- Introduce micro-credentials and modular learning, particularly in tertiary and continuing education;
- Enhance existing qualifications with updated descriptors reflecting green and digital transitions;
- Expand vertical integration between VET and higher education; and to
- Better align academic curricula with labour market needs through stakeholder partnerships.

While the project is still in progress, certain important developments have been initiated at both institutional and regional levels:

- Curriculum enhancements: At TFO Bruneck and other partner institutions, existing modules on manufacturing, automation, and product development have been updated to include sustainability, innovation, and digital logistics. New learning formats and co-designed modules with industry partners are being piloted.
- Micro-credentials and modular courses: Some tertiary and adult education courses are being structured as micro-credentials.
- Integration into curricula: Several modules are being embedded within existing qualification programmes; others are offered as extracurricular learning opportunities. Some lead to recognised learning outcomes, though full qualification recognition within NQFs is still under development.
- Certification and recognition: The potential to award course completion certificates is under consideration. However, no formal recognition by national authorities or transnational frameworks has occurred yet. Private-sector or international certifications are not yet in place.
- Work-Based Learning: While no formal apprenticeships (as defined by EAfA) are currently implemented, the project includes practical, lab-based components that simulate real-world conditions. Partnerships with local industries have led to new internship opportunities and project-based learning experiences.

According to project partners, EE4M has already begun to positively influence the quality and structure of qualifications, especially at the institutional level. Stronger partnerships with companies (e.g., Volkswagen Navarra, MUBIL, Fraunhofer Italia) and international universities have enriched curriculum content and increased relevance. These connections could improve the long-term alignment of EE4M qualifications with evolving labour market demands. Broader national-level qualification updates are expected upon full rollout and validation of course content during the upcoming pilot phase.

Contribution to enhancing the quality and attractiveness of VET

The EE4M CoVE project aims to modernise and improve the quality and appeal of VET by embedding green and digital skills into curricula, promoting collaboration between education

levels, and supporting regional innovation ecosystems. The project expects to align training programmes with national and EU strategies such as the European Green Deal, the Digital Strategy, and the Pact for Skills.

More than 1,000 VET teachers and learners are expected to be trained using modern tools and content that is relevant to the industry. The transnational learning environment is intended to allow partners to horizontally share best practices across VET systems, while vertical cooperation between secondary VET and higher education institutions should benefit joint curriculum design, shared facilities, and integrated teacher training.

Although the project is **still in its development phase**, EE4M has begun contributing to the enhancement of VET systems in several ways: Regional CoVE platforms have been established and curricula modernised, particularly through the introduction of **green and digital competencies** relevant to smart and sustainable operations. These initiatives support national skills strategies and strengthen regional innovation ecosystems, such as in South Tyrol, where EE4M allowed TFO Bruneck to strengthen ties with local industries, opening new traineeship opportunities.

According to higher education institutions involved, the project moreover has improved learning content and methods, giving teachers and students access to **more engaging and future-oriented content**. For example, TFO Bruneck has co-developed new modules, including with input from local companies, that it previously lacked the resources to create. Innovative formats such as hybrid learning and lab-based training are also being adopted.

The modular and standards-aligned design of courses supports **transferability** across regions and sectors. Some partner institutions have already committed to integrating the new content into their permanent curricula or offering it as extracurricular training. **Financial sustainability** is being addressed through the development of a permanent operating model.

By creating transnational learning environments and sharing best practices, EE4M supports regions with less developed VET strategies in catching up. While, owing to the early project phase, concrete success stories are still to come, some foundations have been laid, including new partnerships (e.g., between Spanish and Latin American institutions) and the collaboration between the industrial engineering networks EPIEM and ADINGOR.

10.4. Success factors

Added value of EE4M

The EE4M CoVE promotes transnational collaboration and is enabling the co-development of innovative, future-oriented VET content. At the organisational level, benefits include the creation of novel VET modules and practice-oriented learning labs, as well as the integration of modern teaching tools and green and digital content into curricula. Partner institutions have engaged in course co-development and pilot planning that would not have been possible independently.

EE4M has also strengthened partnerships across education and training, research, and industry, forming a 'knowledge triangle' that links vocational schools such as TFO Bruneck, research institutions like Fraunhofer Italia, and industrial partners including Volkswagen Navarra and Mubil. These collaborations have sparked broader initiatives beyond EE4M itself, including new Erasmus mobility proposals and cross-country alliances among Industrial Engineering and Management associations in Europe and Latin America according to project participants.

Different stakeholders are expected to benefit from the project. The project partners hope students will benefit from increased employability thanks to more engaging and relevant training that aligns with the green and digital transitions, whereas teachers should gain exposure to European best practices and innovative teaching methods. Companies and in-company trainers could benefit from the closer alignment of VET content with workplace needs and improved access to skilled future hires.

Potential for sustainability, scalability and transferability

EE4M shows potential for sustainability and transferability of outputs beyond the life of the project. Several partner institutions are planning to integrate the developed training modules into regular curricula. This integration – often financially supported by national systems or industry stakeholders – is expected to allow outputs to continue delivering value beyond the Erasmus+ funding period. Additionally, extracurricular use of modules and the ongoing development of a "Permanent Operating Concept" under Work Package 2, aiming to make project outputs (economically) sustainable beyond the Erasmus+ funding period, are further steps toward ensuring operational and financial viability across diverse institutional contexts.

The training materials developed by the project will be made accessible via the EE4M Moodle platform. Moreover, results from the early project phase have been disseminated in international conferences and journals. The open licensing approach as well as the modular structure of the learning content both should facilitate scalability and allow for the materials produced to be used beyond the institutions involved. EE4M's teaching formats are designed to be adaptable to different education systems, geographies, and industries beyond the mobility sector, although the more sector-specific knowledge will require adaptation.

Good practices that support transferability and sustainability include joint curriculum development between higher education institutions and VET institutions, shared use of labs and research facilities, and joint teacher training initiatives. Participants feel that clearly defining intended learning outcomes and assessment strategies has helped in adapting content to various educational levels.

Close cooperation with industry is another aspect cherished by project participants, as they feel it enhances the relevance and longevity of EE4M's outputs. Through providing input to curriculum development, as well as via real-world project assignments and train-the-trainer programmes, companies are actively involved in shaping the educational offerings. Regular stakeholder consultations are meant to ensure that the content remains aligned with evolving technological and labour market needs, thus supporting the project's adaptability and relevance in the longer term.

10.5. Overall impact and lessons learnt

The EE4M project has established a transnational Centre of Vocational Excellence that brings together institutions from secondary, tertiary, and continuous education and training and has been designed to deliver integrated, future-oriented training across the European mobility value chain. In aligning modular curricula with real industry needs and fostering structured cooperation between education providers, research institutions, and industry partners, the project is laying the groundwork for a future skills ecosystem in smart and sustainable operations management. The ongoing challenge is to embed these collaborations into permanent institutional arrangements.

EE4M has already left a mark on teaching practices and institutional development, with participating institutions reporting a transformation in their educational approach. Teachers and students are increasingly engaging with digital platforms, green technologies, and industry-relevant tools. These innovations have the potential to improve the quality of education and the employability and adaptability of graduates in a rapidly changing labour market.

The long-term impact of EE4M is expected to extend beyond the funding period. With the integration of its courses, micro-credentials, and digital resources into national and institutional systems, the project is working to ensure the sustainability and continued use of its outputs. Although its full impact will only become measurable after the pilot activities are completed and the permanent operating concept is implemented, the project is demonstrating the potential of collaboration across sectors and borders. Ultimately, the project aspires to produce a workforce equipped with the skills necessary to drive innovation and sustainability across the mobility value chain in Europe and beyond.

11. EPLUG – European Platform for Urban Greening

11.1. About EPLUG

Background information

- **Project name:** EPLUG – European Platform for Urban Greening
- **Duration:** 2020-2024
- **Call year:** 2020
- **Project status:** Completed

EPLUG is a project led and coordinated by Stichting Yuverta, a vocational college focussing on skills and qualifications related to urban greening in the Netherlands.

The project involved 15 partners across six countries (Czech Republic, Denmark, Finland, the Netherlands, Romania and Spain), including VET schools, private businesses, professional associations and NGOs.

Objectives of the CoVE project

The European urban greening sector faces several major challenges in ensuring sustainability of European cities, which raise need for the development of skilled workforce across industries related to the urban greening sector. Some of the major challenges can be summarised as follows:

- **Climate adaptation urgency:** rising demand for resilient sustainable green infrastructure due to rises in weather amplitudes and overall temperature increases.
- **Biodiversity crisis:** pressure to create urban spaces supporting wildlife, ecological corridors, and native species.
- **Sustainable use of resources:** the need for increasing efficiency in the utilization of water, land, and budgets drives innovation in efficient, multifunctional green spaces.
- **Digital transformation:** smart city technologies and data-driven maintenance systems requiring new skills in traditional sectors with shorter history of formal qualifications (i. e. gardening professions responsible for the development and maintenance of green spaces in urban areas).
- **Skills-education gap:** disconnect between industry needs and educational programmes creating workforce shortages, with urgent need for business-education partnerships to train students and upskill professionals in emerging green technologies, ecological practices and comprehensive skills necessary for the needs of current labour markets.

The EPLUG project addresses these challenges through Centres of Vocational Excellence (CoVEs) in each participating country and a Platform of Vocational Excellence (PoVE) networking the CoVEs in the different participating countries. It does so through developing specialised curricula and training methods in sustainable landscaping, biodiversity management, and digital innovations in education as well as technological spin-offs. Through international exchanges between the partners and project participants and hands-on training, stakeholders interviewed indicated that the project has effectively upskilled both adult and young learners as well as teachers while fostering innovation.

Here, it is important to note that while referring to learners, interviewees used the term interchangeably, referring to differently aged learners across initial IVET and CVET. This is because differentiating between IVET and CVET does not necessarily differentiate between different age groups, as initial VET in the urban greening sector is often attended by adult learners, as interviewees from Finland and Spain pointed out. Many activities were also organised for different target groups together (i. e., International greening Weeks attended by both learners in IVET and their teachers). In this case study, we tried to differentiate young

learners, adult learners and teachers where appropriate but were limited by the interchangeable use of terms in the information available.

Nevertheless, by creating collaborative networks where educational institutions, businesses, and municipalities work together on local environmental challenges, EPLUG demonstrates how targeted educational ecosystems can drive sustainability and innovation across Europe's urban greening sector, establishing a model for continued professional development, cross-sector collaboration as well as collaboration and mutual learning across borders.

11.2. Activities of EPLUG and skills developed

Activities covered

By establishing partnerships between innovative businesses and educational institutions, the project ensures that professionals responsible for developing and maintaining green infrastructure – including green roofs, vertical gardens, and public green areas – possess the expertise to implement ecological solutions, operate efficiently, utilise advanced technologies, and contribute to sustainable urban ecosystems. As part of the project, technological innovations have also been developed and advocacy efforts have taken place to ensure systemization of educational innovations.

The activities undertaken by the project partners include:

- **Raising awareness** about urban greening through podcasts, webinars and public events which drew members of the public directly into urban greening practices (i. e. meadow weeding festivals in Finland).
- **Attracting new young talent into urban greening professions** via innovative curricula and educational pathways highlighting green career opportunities for IVET learners (see examples below).
- **Developing high-quality curricula and learning materials.** Collaborative curriculum development with industry partners ensured that new qualifications remained cutting-edge, with companies providing practical expertise and real-world learning environments while educational institutions transformed this knowledge into structured learning programmes aligned with labour market needs.
- **Systemizing innovations** on regional or national scale through policy and advocacy, such as in the case of development of professional standards with the Ministry of Education in Romania which concluded in the registration of the Urban Greening occupation in the National Code of Occupations.
- **Developing and providing curricula** that are aligned across the participating countries and with EQF standards, such as in the case of the Urban Gardener qualification and professional standard in Romania.
- **Developing innovations through numerous spin-off initiatives** that extended its impact beyond initial goals. Notable developments include the successful Tecroc Urban project for vertical greening solutions, the BARCoVE applied research centre connecting VET institutions with industry partners, and the establishment of Living Labs in Denmark - real world environments where educators, industry professionals, policymakers and researchers jointly develop, test and refine urban greening solutions through conducting practical experiments and exchanging knowledge.

Skills developed

Through the activities outlined above, EPLUG contributed to the development of a wide variety of skills for young and adult learners. By going well beyond technical expertise, learners were equipped with holistic skillsets necessary for professionals to contribute to solutions of issues related to climate change, biodiversity crises and sustainability needs. Our interviewees from the project have drawn on a variety of examples, some of which are highlighted below:

- **Transversal skills:** Communication, teamwork, problem-solving and intercultural skills were enhanced through challenge-based learning approaches (in the case of IVET learners in Spain), International Urban Greening Weeks (for the public as well as IVET learners and teachers) as well as industry internships for IVET learners. Romanian IVET students who participated in international mobility overcame initial communication challenges and eventually became "ambassadors" for collaboration, while Spain's CoVE implemented challenge-based teaching that boosted IVET learners' critical thinking when addressing real-world scenarios. In Finland, close cooperation between a company and a VET school equipped IVET learners with soft skills such as communication, teamwork, and professional conduct by immersing them in real-world work environments.
- **Occupation-specific skills for urban greening:** Specialised vocational skills were developed through 45 new qualifications across 6 countries designed with industry input, including Romania's groundbreaking "Urban Gardener" qualification now officially recognised in their National Code of Occupations. The Netherlands established the Green Roof and Façade Experience Centre for hands-on training in sustainable infrastructure implementation, while Spain created professional certifications in "Urban Trees and Palm Trees Management" and "Professional Sports Turf Installation".
- **Green skills for sustainable development:** Skills in biodiversity, climate adaptation and ecosystem management were advanced through specialised training and community engagement. Finland's CoVE developed bioactive composting methods and organised participatory "weeding festivals" with the City of Tampere, while Denmark created biodiversity courses and experimental centres for climate-adaptive landscaping practices.
- **Digital skills related to urban greening:** Technological skills of young learners were enhanced through virtual learning platforms and monitoring systems for green infrastructure. Finland led the development of 3D virtual tools for exploring green walls and vegetative roofs, while the Netherlands incorporated sensor technology at their Experience Centre, teaching young learners to collect and analyse environmental data for maintenance planning.

As outlined above, the European Platform for Urban Greening integrated comprehensive skills-building that encompassed not just technical expertise, but also soft skills, practical learning, and intercultural competences, all of which contribute to equipping the current generation of urban landscapers with skillsets to address the most pressing challenges of greening urban environments.

This was possible due to collaborative partnerships between educational institutions and industry experts. Interviewees for the case study appreciated the design of the European Platform for Urban Greening as it emphasised the building of strong networks in a structured and iterative way, which helped them to address gaps in establishing partnerships systematically. Partners of the project regularly organised so-called 'CoVE talks' with various stakeholders, which gradually led to an increased interest from different parties, evolving into concrete partnerships for vocational excellence. This led to the establishment of networks and partnerships based on both pragmatic mutual benefits and a shared mission to drive positive change in urban greening across Europe.

"The project we completed was to design a garden for the balcony of a hospital in the town of Benešov (note: a town in Czech Republic), which is where our project took place. (...) We visited the site to take measurements and plan the vertical garden design. Then we spent a day using design software, working alongside people from different countries. We collaborated on the design, shared ideas with each other, and finally gave a presentation of our work."

Student from Spain interviewed by ICF about her international experience with the European Platform for Urban Greening

There is significant added value to the processes and practices that partners in the project developed to create authentic interest of different stakeholders to engage in furthering vocational excellence. While in some countries (e. g. the Netherlands), these 'softer' processes are fully embedded due to a long history of private-public partnership models, other countries are testing different approaches to establishing functional partnerships through experimentation, and the CoVE project funding enabled them to invest time and directed focus into the development of functional networks that they otherwise would not have had the capacity for.

Some specific examples of outcomes of these partnerships may include the Tecroc Urban technology, which is an innovative green wall system designed for different climate zones. It was patented by a Spanish company and through collaboration with educational institutions in Spain directly integrated into training programmes. Through CoVE international networks, the technology is also being introduced in other countries.

In Denmark, a landscaping company actively hosted apprentices for biodiversity and climate adaptation training and co-developed training programmes with the Danish Green Academy. Together, the company and the Academy also jointly developed a pilot mentoring programme for new employees. Through another spin-off applied research project in Denmark (BARCoVE), students from the Academy also engaged in the 'Blue-Green Innovation Challenge Hackathon', where students got to be part of a platform where research findings could be practically applied to industry challenges.

This together with other practices in the European Platform for Urban Greening shows specific contributions of the project to EU frameworks such as DigiComp or GreenComp, although the use of these frameworks in the project is rather implicit.

11.3. Results achieved

Contribution to the development of qualifications

To effectively target the needs of the urban greening sector, formal education provision was central to the provisions that were developed in the European Platform for Urban Greening. In some countries, formal qualifications in the sector were practically non-existent (namely Romania). In other instances, municipalities showed interest in improving their urban landscaping practices and wanted to utilise innovative formal education as a means to raising standards in developing and caring for green spaces in their regions (namely Finland). Overall, the urban greening sector engaged in the project has shown interest in using formal qualifications to help them achieve their goals in urban sustainable development.

During its running, the European Platform for Urban Greening successfully developed 45 new or updated qualifications and courses across partner countries. Some examples of notable qualifications in partner countries include the following:

- In **Finland**, the project developed the LUMOtarihuri Biodiversity Gardener qualification (EQF level 4). AhlmanEdu, in close collaboration with VRJ (a company partner), created a comprehensive and innovative programme. The qualification was uniquely designed to run during winter when gardeners typically have no work, and notably, it shifted its focus from traditional approaches to assessment through written tests towards approaches where students must demonstrate their skills in practical settings provided by the company.
- In the **Netherlands**, a new Green Roof Qualification was developed and has been offered since 2023. It addresses technical aspects of green roof installation ranging from health and safety procedures to structural considerations and equipment.
- In **Spain**, La Malvesia VET school developed two key certifications: Professional Turf Installation & Maintenance and Urban Tree & Palm Tree Management, both at EQF level 4. The programmes have been approved by authorities and are currently being developed in detail with partner companies. While both qualifications are designed as

500 hour continuing vocational training programmes, companies will be able to request specific training modules for their workers.

- In **Romania**, the most significant qualification development was the Urban Gardener qualification, which became nationally recognised at EQF level 3. This was a groundbreaking achievement, as it was the first formal qualification in urban greening in the country. The curriculum development process involved extensive collaboration between 5 new VET schools of agriculture, landscaping companies, the Romanian Arboriculture Association (ARA), the Romanian Landscapers Association (ASOP), and WorldSkills Romania. The qualification went through a rigorous quality assurance process, including registering the occupation in the National Code of Occupations and developing a professional training standard that incorporated industry insights. One of the key outputs of the process is also a Professional Training Standard for the Urban Gardener qualification, defining the qualification as providing technical training for practical work in public and private landscape spaces.
- In **Czechia**, the Benešov Vocational School (VOŠ a SZeŠ Benešov) now offers a 4-year programme in Design of Urban Greening at EQF level 4, which focuses on innovative approaches to establishing and maintaining urban green spaces that respect climate change adaptation, and addresses urban planning and water management. Additionally, the school developed several short courses at EQF levels 3 and 4, focusing on irrigation systems, modern trends in green space maintenance, and water management in green cities. They also offer so-called Climate Internships for students to experience real-life practice in the field of climate protection.
- In **Denmark**, the CoVE has developed innovations such as the Virtual Green Academy, a digital platform with virtual reality features that helps students learn about campus plant life, or the Blue-Green Innovation Challenge Hackathon, which brings together students, experts, and companies to solve real-life challenges. The partnering CoVE has also established the Green Slope Experimental Centre, which is specifically designed as a training facility where teachers, students, and industry professionals can learn about working on green roofs and sloped surfaces.

While developing qualifications in the same sector across many countries may be challenging, some European tools served well in coordinating these efforts. Using a needs assessment exercise in each country at the beginning of the project, along with the European Qualifications Framework (EQF) as a reference tool, helped stakeholders in diverse contexts guide the development of educational programmes or training courses. By using these tools, stakeholders were able to coordinate their cooperation effectively to target curricula development to labour market needs and develop qualifications which used knowledge and expertise shared through the international Platforms of Vocational Education.

This structured approach enabled European collaboration in EPLUG to foster mutual learning that transformed shared innovations into national-scale implementations. Partners learned from each other across Europe, sharing practices and adapting innovations to fit their local contexts through training exchanges and joint course development. As a result, the CoVEs engaged in the project were able to develop and provide curricula that are aligned across the participating countries and with EQF standards. Romania exemplifies how this worked in practice: by learning from partners like the Green Academy and bringing together local stakeholders, they turned shared European knowledge into their own nationally recognised Urban Gardener qualification that is now officially part of Romania's occupational framework.

Contribution to enhancing the quality and attractiveness of VET

VET has been reported by some of the interviewees to suffer from lower attractiveness. This was mentioned especially in relation to Romania and the Czech Republic, where partners in the European Platform for Urban Greening have found VET education and career trajectories to be considered 'second best choices' compared to comprehensive education pathways and non-vocational job trajectories. At the same time, new demand for vocationally educated workers in

the green sector has emerged in Europe. This is both due to increased urbanization and the need for well-designed green spaces in cities, and interest of the public and the private sector to meet climate goals like the European Green Deal.

While these contextual factors drive demand for a higher quantity of workers in the urban landscaping industry, there is need to raise standards for qualifications of these workers to meet the advanced sustainability elements of the industry. This creates momentum for young people to orient towards green careers with high prospects in the future as well as momentum for green VET to implement innovations and offer up-to-date skills development.

Programmes with technological innovations, meaningfully incorporated practical elements in the curriculum and applied research utilised in the curriculum can gain traction among students and professionals seeking reskilling opportunities and increase the attractiveness of the VET sector. The European Platform for Urban Greening has observed successes in this regard. Project partners interviewed for this study have reported interest in their new programmes and courses and in some cases mentioned reaching full capacity of their new formal qualification programmes (namely Spain, Finland). The number of people trained in total reported in the impact evaluation of the project is presented in the following table.

Country	Total participants trained	EQF level
Czechia	332	EQF 3-4
Denmark	341	EQF 3-4 (students, EQF 5 (lifelong learning))
Finland	1,137	EQF 3-5
Netherlands	1,561	EQF 2-5
Romania	42,000 (although participants 'reached' reported rather than 'trained')	EQF 3
Spain	Not quantified	EQF 4-5
<i>ELCA (honorary business partner)</i>	26	EQF 5-6
Total	~45,397 participants reached and trained	EQF 2-6

In interpreting the efficiency of sources invested and the added value of the project, it needs to be taken into account that a significant amount of resources were invested into the development of innovations, new curricula and functional networks. The long-term impacts on employability, achievement of sustainable agendas and closing of skills-gaps would require a cross-country mixed methods evaluation study. Interviewees contributing to this study have, however, reported that steps taken to achieve advancements in the urban landscaping sector have contributed meaningfully to raising the attractiveness of the sector.

In relation to improving the quality of VET, the European Platform for Urban Greening contributed to developing curricula that are more closely aligned with industry needs in the urban greening sector. The project brought together educational institutions, businesses, and local authorities to create training programmes that addressed identified skills gaps. This approach helped ensure that VET programmes more effectively prepared students for current workforce requirements. The project also enhanced VET quality by introducing new teaching methods and creating learning environments that expanded beyond traditional classroom instruction. By facilitating international exchanges, establishing practical training centres, and developing collaborative learning approaches, the project helped VET education become more responsive to professional needs.

11.4. Success factors

Added value of EPLUG

The European Platform for Urban Greening advanced policy development through a collaborative approach that brought together vocational schools, companies, municipalities, and governmental bodies. The project proposed 26 policy recommendations on EU, national and regional levels of governance. To mention some specifics, on the EU level, the European Landscape Contractors Association contributed to changes in the EU Nature Restoration Law. In Spain, La Malvesia worked directly with local authorities, providing training sessions and technical briefings on urban landscaping to municipalities. By creating platforms for dialogue and developing practical solutions and recommendations embedded in strong technical expertise from companies and education providers, the project helped bridge the gap between educational innovation and policy development in the urban greening sector.

"As part of Work Package 1 in the EPLUG project, we had to conduct a needs analysis, or at least formalise it, because we had enough discussions before to be aware of the needs in this field in Romania. By doing this needs analysis, we actually published a document called the 'Atlas of Professions and Competencies in the Field of Urban Greening in Romania'. We developed this Atlas using a foresight methodology, which is a methodology that helps predict what will be needed in the future and what policymakers need to do to support the field of urban greening in this case. And through this document, we brought in the arguments for introducing the new qualification."

Project partner from Romania

Added value of the project also stems from the international CoVE network, which contributed to knowledge exchanges and collaborative learning across different European contexts. In the case of Romania, the new Gardener qualification together with its professional standards could be developed together with the Romanian Ministry of Education because the leading partner in the country (World Skills Romania) identified an opportunity through their international networks to apply to be a partner in the CoVE project, and thereafter secured job shadowing opportunities in other EPLUG countries for people who were to develop the qualification. This ensured that even before they began the official process, people were prepared for the task having observed innovative qualifications elsewhere.

In addition to that, the CoVE project in Romania allowed for a stronger engagement of different stakeholders in the process (i. e. industry partners like the Association of Landscaping Architects, and RPR – a landscaping company), as well as a focus on bringing local innovations developed on a single school's grounds to the national policy level. In this context, there were processes in place on the level of the Ministry to guide the development of the professional standards, but it was the European Platform for Urban Greening partners who brought in a proposal in the first place. In this regard, the CoVE project also played a key role, because the needs assessment that took place in all partner countries provided critical arguments in favour of systemizing the Gardener qualification.

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Potential for sustainability, scalability and transferability

The Centres of Vocational Excellence (CoVEs) established through the EPLUG project have been highly successful in securing additional funding to complement the Erasmus+ grant and

expand their initiatives. Overall, the CoVEs attracted EUR 3.8 million in co-funding and 239 new partner organisations.

In Romania specifically, the CoVE obtained approximately EUR 1 million over the four-year EPLUG implementation period from corporate social responsibility programmes, local administration, and Erasmus+ Key Action 1. The Romanian CoVE also applied for EUR 80,000 from a bank's CSR programme to support three agricultural high schools in implementing the new Urban Gardener qualification, though this was pending approval at the time of the interview.

The CoVEs at AhlmanEdu in Finland and La Malvesia in Spain are both grappling with financial sustainability after their initial Erasmus+ funding ended. While ongoing network operations are not prohibitively expensive, the Finnish CoVE struggles to maintain and update costly initiatives like VR learning materials due to constrained national funding. Furthermore, the Spanish CoVE is actively diversifying its funding streams by partnering with companies to deliver paid employee trainings, seeking in-kind contributions of staff time from partners, and continuously applying for new national and EU projects to support ongoing innovation. Despite these efforts, there are challenges in securing adequate resources for larger-scale initiatives in the absence of dedicated external funding support.

Nonetheless, the sustainability element of CoVE initiatives in each country lies in creating long-term partnerships within CoVE ecosystems. While these networks need to be maintained, they can be mobilised around a shared vision and objectives that have been developed during the time that the CoVE funding was in place.

The project coordinator is currently working on an application for a new project (working name 'EPLUG 2.0') to continue the successful CoVE initiative in the following years.

11.5. Overall impact and lessons learnt

The European Platform for Urban Greening, led by Stichting Yuverta, positively impacted the urban greening sector across Europe by developing 45 new or updated qualifications and courses, enhancing the quality and attractiveness of vocational education and training (VET), and advancing policy development through collaborative partnerships.

The project addressed major challenges such as climate adaptation, biodiversity crisis, sustainable use of resources, digital transformation, and the skills-education gap by creating specialised curricula, fostering innovation, and facilitating international exchanges. It contributed to the alignment curricula with industry needs, developed innovative teaching methods, and established long-term partnerships within CoVE ecosystems, attracting EUR 3.8 million in co-funding and 239 new partner organizations.

The project's sustainability and scalability were supported by the creation of functional networks and the alignment of shared visions and objectives. While challenges remain regarding funding diversification for costly innovations and ensuring cross-border recognition of qualifications, the platform has established a strong foundation with its extensive network of partners and proven track record of securing substantial co-funding. This groundwork positions the initiative well for continued growth and impact, building on the momentum created by its successful collaboration model and the growing European commitment to sustainable urban development.

12. EULEP – European Learning Experience Platform

12.1. About EULEP

Background information

- **Project name:** EULEP – European Learning Experience Platform
- **Duration:** 2022-2026
- **Call year:** 2021
- **Project status:** Ongoing

EULEP (European Learning Experience Platform) is a CoVE project led and coordinated by Eurochambres. It involves 20 partners across eight countries (Belgium, Spain, France, Italy, Cyprus, Latvia, Austria, and Türkiye). The consortium partners involved are national and regional Chambers of Commerce and Industry (CCIs) affiliated to Eurochambres with well-established links with regional and local authorities and businesses in their respective countries.

Objectives of the CoVE project

EULEP aims to further develop and elaborate the subjects of artificial intelligence (AI), virtual reality (VR) and social innovation (SI) as means to promote lifelong learning in enterprises. It aims to enhance the appeal of Continuing Vocational Education and Training (CVET) for lifelong learning by offering businesses tailored training modules in AI, VR, and SI. EULEP CoVEs are established at regional and national levels, embedding VET in regional economic strategies through the involvement of CCIs that are members of Eurochambres, helping to ensure sustainable governance.

The project aims to integrate rigorous skills intelligence into training materials by conducting extensive labour market research and skills gap analysis. This ensures the training materials are relevant and aligned with the digital transformation needs of businesses.

At the heart of EULEP lies the implementation of the European Learning Experience Platform, which brings together 20 organisations from 8 countries, working together to make continuous VET more attractive for lifelong learning, and offer businesses new and tailor-made training modules that correspond to their skills needs in innovation-oriented subjects.

12.2. Activities of EULEP and skills developed

Activities covered

The activities of EULEP complement each other and allow for a progressive implementation of the project.

Cluster 1: Teaching and learning

This activity cluster began with the Market Analysis phase, which allows the partners to lay the basis for the development of the training modules, following a bottom-up and end-user-centred approach. Based on a survey of businesses from all sectors disseminated by the CCIs, 717 replies were collected⁶⁹. The training needs of companies in the fields of AI, VR, and SI were identified and subsequently transformed into learning outcomes. The outcomes of the market analysis were published in two documents: a report on “Workforce needs for up and reskilling in Artificial Intelligence, Virtual Reality and Social Innovation” and a set of recommendations for the development of transnational training modules.

⁶⁹ EULEP Deliverable: Workforce needs for up and reskilling in Artificial Intelligence, Virtual Reality, and Social Innovation <https://eulep.eu/wp-content/uploads/2023/08/D2.1-Report-final.pdf>

Next, the Training path definition and Modules development phase takes place, during which three learning paths with modules and units for AI, VR, and SI are developed. The partners will ensure maximum flexibility, allowing Higher Education and VET providers to integrate the learning outcomes into existing curricula and training paths. These three training paths, along with a 'train the trainers guide,' will be shared with the public. CCIs in each of the partner countries play a crucial role in developing the CVET programmes to be delivered to SMEs.

While the training paths are being developed, a functional e-learning platform is being established at the European level. This platform will be crucial for the subsequent learning process and accessible to registered users. The training materials will be integrated into the platform and taught to selected target groups during the 'Piloting, Action Piloting Plans & Capacity Building' phase. Starting with the European Learning Academy for VET and training providers, the new training course will be progressively implemented in the eight participating countries, targeting groups including VET trainers to companies. The piloting activities will conclude with multiplier events to disseminate the outputs and results.

The European Learning Academy serves as a platform for consortium partners to familiarise trainers from participating countries with the training materials and the online learning platform developed under EULEP. Initially, the consortium partners from the eight countries represented in EULEP were tasked with delegating a minimum of three trainers from the EULEP national CoVEs to the European Learning Academy, with one trainer for each subject (AI, VR, and SI), totalling 24 trainers. This target was exceeded, with a total of 33 trainers from the eight partner countries participating in the European Learning Academy. Through this process, as well as the development of common guidelines and recommendations⁷⁰ for the organisation of training on the three subjects (AI, VR, and SI), the CoVE consortium partners reached out to VET providers in their respective regions and countries, resulting in over 400 trainers being trained across the three subjects.

Cluster 2: Cooperation and partnerships

In the 'Regional hubs for cooperation in and promotion of VET' phase, project partners reach out to European Digital Innovation Hubs (EDIH) in their respective countries/regions to exploit the possibility for collaboration and joint action with the EDIH in the chosen subjects (AI, VR, SI) for the sake of the ultimate beneficiaries of the training activities, and CVET more broadly. Together they engage in joint VET promotion campaigns and organise skills competitions. The skills competitions serve as a tool for informal education while bringing concrete benefits to the companies taking part.

The outcomes of the skills competitions will be published in a 'skills competitions report' and will serve as a promotional tool for CVET, supporting lifelong learning. Additionally, the project partners will develop an 'SMEs Skills Diagnosis Handbook,' which will help companies identify their human capital needs through self-evaluation and provide guidance on training employees while maintaining ongoing business activities.

Cluster 3: Governance and funding

This is addressed in the "VET Councils for sustainable governance and funding" work package.

Two good VET governance practices have been pre-identified for the EULEP project. The project partners will get to know both initiatives in detail and will be in the position to improve VET governance at their respective level thanks to the adoption and adaptation of one of the two models (or a mix of both).

In the context of improved governance, the partners will develop smart VET strategies for AI, VR, SI that are to be embedded in wider regional/national economic development strategies. The strategies will be accompanied by concrete action plans that will look beyond the project's

⁷⁰ EULEP Deliverable: Recommendations for the development of transnational training modules
<https://eulep.eu/recommendations-for-the-development-of-transnational-training-modules/>

lifetime and consider all financial aspects, making best use of regional, national and/or EU funding.

The adaptation process experience will be summarised in a VET Council Handbook, that is to describe VET Council and Cluster practices and offer the reader tips on how to set up VET Council or Cluster structures. The handbook will be accompanied by a toolkit offering practical tips and guidance for the VET Council's daily operations.

Skills developed

The EULEP project offers training aligned with private sector needs, based on labour market research and skills intelligence. It focuses on transversal skills, particularly in AI, VR, and SI, supporting businesses in managing digital transitions. In this regard, the AI, VR and SI course modules cover e.g., the application of AI and VR in business (e.g., HR, marketing); the ethical and legal issues of AI and VR; change management and workforce skills development through AI, VR and SI

The training materials on artificial intelligence, virtual reality, and social innovation were developed through a collaborative process informed by market analysis and business outreach. CCI and VET providers co-created the content, focusing on practical application rather than technical programming regarding AI and VR. The materials are currently being refined nationally based on feedback from trainers and businesses.

- **Needs assessment:** Initial market research identified key skills gaps in AI, VR, and social innovation.
- **Collaborative development:** CCIs and VET providers jointly created learning outcomes and training paths.
- **Practical focus:** The training emphasises real-world application, including tools like VR glasses and practical exercises.
- **Business relevance:** Modules guide businesses on technology integration, team skills, and performance monitoring.
- **Ongoing adaptation:** National-level revisions are underway to tailor the materials to local needs.

Training paths are structured into thematic units and practical modules, emphasizing the application of technologies in the workplace. The approach combines technical knowledge with guidance on human factors, helping companies effectively integrate emerging digital tools and processes into their operations.

More specifically, EULEP covers:

- **Transversal skills**, such as communication, critical thinking, interpersonal skills, negotiation, and problem-solving – using the Entrepreneurial Competence Framework (EntreComp) as a foundation.
- **Occupation-specific skills** given that training is tailored to regional economic contexts and occupational profiles (e.g., the textile industry in Turkey and sales in Catalonia). The project uses learner personas to design targeted training for working adults engaged in digital transformation.
- **Digital skills and competences**, which are embedded across all training pathways, covering areas such as AI implementation, strategic digital planning, and the use of VR. The project highlights digital skills as essential for driving enterprise transformation.

The project applied the EntreComp framework primarily to define learning outcomes for the social innovation training, using it as a source of inspiration to shape the course direction. Following partner consultation, six EntreComp competences were selected to underpin the SI Learning Path under EULEP (Working with others; Mobilising resources / Mobilising others; Taking initiative; Creative thinking; Spotting opportunities; Ethical and sustainable thinking).

In contrast, the DigComp and GreenComp frameworks were not extensively used, as the project prioritised the practical application of digital technologies over direct instruction in digital or green competences.

12.3. Results expected and achieved

Contribution to the development of qualifications

The training materials developed by the project are based on the EQF and the lessons learnt from ECVET (European Credit System for Vocational Education and Training). EULEP concentrates on the development of qualifications at EQF levels 4 and 5. Each training path (i.e., AI, VR, SI) includes a comprehensive curriculum with modules accounting for around 60-70 hours of training, including theory and practical components. Alignment with EQF ensures that the training programmes meet the required standards for these levels.

To oversee this, VET Councils are to be established in each consortium partner country to ensure that the training programmes align with national qualification frameworks. These councils include representatives from universities, ministries, and vocational qualification bodies.

Efforts are underway to get training materials recognised at the national level in various countries, with positive feedback received by partners in Turkey, Italy, Belgium, Cyprus, France, and Austria. The adaptation phase, which involves adjusting training materials to meet national requirements, and the recognition process may continue beyond the project duration.

CVET has different recognition processes in each country. The EQF criteria serve as a common basis for the training materials.

EULEP is developing micro-credentials, which are typically between 1-3 ECTS. These micro-credentials are designed to be manageable for working adults, offering flexible and concise learning opportunities. However, these micro-credentials have not yet been integrated into national curricula, and the process of integration varies by region.

The AI, VR and SI training modules go beyond generic digital training; they are custom designed for SMEs, acknowledging their unique constraints and capacities. Moreover, the validation and recognition of these learning pathways further strengthen their value, enhancing the employability, adaptability, and competitiveness of SME staff in a rapidly transforming economy, according to the project coordinator.

Contribution to enhancing the quality and attractiveness of VET

The project aims to enhance the quality and attractiveness of VET by integrating online learning and offering flexible, personalised training options. This approach helps to break down traditional barriers to access, such as geographic and time constraints, making VET more accessible to lifelong learners and working adults.

As such, EULEP is training companies in AI, VR, and SI (social innovation). Based on the initial needs analysis conducted with businesses, it was found that many companies do not use AI or VR because they are unsure of their applications. The training programme accompanies companies through the digitalisation process by first informing them about the technologies, their potential uses, and helping companies prepare for the digitalization process if they choose to adopt these technologies. SI is integrated to mitigate the human resources effects that the introduction of these technologies may generate.

The EULEP project supports regional and national strategies for VET excellence through active cooperation and partnerships with various stakeholders, whereby CCIs play a critical role in activating their networks, linking with businesses, VET and higher education institutions as well as their respective EDIHs. This collaboration helps to align the project with local economic needs and policy priorities. Furthermore, the VET governance initiatives in the project are expected to enhance VET systems through several key activities:

- **Establishment of VET Councils:** These councils bring together a wide array of stakeholders, including employers' organisations, public authorities, trade unions, academia, and VET providers. They discuss and provide advice on the development and implementation of training materials, ensuring that they meet the needs of businesses and the labour market.
- **Drafting Smart VET Strategies:** Via the VET Councils, partners are invited to draft smart VET strategies that integrate VET into the economic development strategies of their regions or countries. This includes creating action plans that outline concrete steps to be taken to improve VET provision and governance. Smart specialisations partners are invited to draft smart VET strategies for economic development of their respective countries and regions.
- **Continuous Exchange and Collaboration:** The initiatives encourage continuous exchange and collaboration between stakeholders at local, regional, and national levels. This helps to ensure that VET systems are responsive to the evolving needs of the labour market and can adapt to new challenges and opportunities.
- **Quality Assurance and Monitoring:** The project has set up quality assurance mechanisms and an extended monitoring system to ensure that all outputs respect quality criteria. This helps to maintain high standards in VET provision and ensures that training materials are effective and relevant.

The project contributes to the EU's New Digital Strategy by promoting digital technologies among businesses. It also has the potential to support the European Green Deal indirectly by encouraging more sustainable practices through digitalisation. The indirect contribution of the project to the EU Green Deal is observed in the reduction of raw material usage due to digitalisation, through some practical examples provided by the interviewed consortium partners, e.g., reduction in paper use through digitalisation of administrative processes, reduction in raw material consumption through testing in a VR environment.

12.4. Success factors

Added value of EULEP

The EULEP CoVEs bring added value through their ability to integrate skills intelligence, anticipate labour market needs, and conduct comprehensive skills gap analyses. This is achieved through a combination of labour market research, stakeholder engagement, and systematic reviews of existing training provisions to identify gaps and develop high-quality, demand-driven training materials.

This was also made possible through an inclusive approach to developing EULEP activities, in which the CCIs participating as consortium partners engaged their own stakeholders within their respective networks via the regional CoVEs.

One of the most notable impacts of EULEP has been on trainers. Positive

feedback from trainers, with high participation rates and satisfaction levels, indicates that the training materials are effective and well-received. The project is expected to have a lasting impact by enhancing the quality of VET and fostering continuous improvement in training practices. The pilot phase alone attracted over 400 trainer registrations, with 82% reporting high satisfaction with the training materials, demonstrating both the quality and relevance of the resources provided. These outcomes confirm the usefulness and positive reception of the materials among the target audience.

"We have organised the activities so that all partners contribute to all tasks. In some activities, certain partners, such as the CCIs, take a leading role. This is particularly true for surveys reaching out to businesses. However, during the survey creation phase, all the regional CoVE partners collaborate to develop the surveys together. This ensured an inclusive approach to the various tasks and activities within the project."

Project coordinator

EULEP also contributes to regional development by aligning VET provision with smart specialisation strategies. In this regard, the consortium partners work in close cooperation with European Digital Innovation Hubs (EDIHs) to design Smart VET Strategies in the areas of Artificial Intelligence (AI), Virtual Reality (VR), and Sustainable Innovation (SI). Each consortium partner is responsible for drafting action-oriented strategies that embed VET into broader regional or national economic development plans under the leadership of Eurochambres. These strategies include concrete implementation roadmaps and financial planning, ensuring sustainability and impact beyond the project's duration.

EULEP therefore creates synergy with the Digital Europe Programme by leveraging the capabilities of EDIHs in each region to co-develop targeted CVET programmes in AI, VR, and SI that are tailored to the sectoral priorities of each region or country, supporting the growth of digital and green economies. Furthermore, EULEP partners and EDIHs will together engage in joint VET promotion campaigns and organise skills competitions. The skills competitions will serve as a tool for informal education while aiming to bring concrete benefits to the companies taking part⁷¹⁷².

According to the project coordinator, EULEP contributes to the Union of Skills by promoting CVET, with a focus on emerging areas like AI and VR. Its tailored programmes help individuals regularly upskill or reskill, aligning with business needs and supporting EU-wide recruitment. By fostering a transnational approach, EULEP enhances skills mobility and employability, enabling workers to apply their expertise across regions. In doing so, it strengthens a competitive, adaptable workforce and supports quality employment. EULEP thus contributes to advancing lifelong learning and facilitating the free movement of skilled workers across the EU.

While Eurochambres is a member of the Pact for Skills, but not all EULEP project partners are yet involved. There is untapped potential for closer alignment and cooperation with the Pact for Skills to further scale up and coordinate efforts across the EU's skills agenda, according to the project coordinator.

Potential for sustainability, scalability and transferability

EULEP has developed transnational training modules, as well as guidelines and recommendations for their implementation, and is currently working on a VET Council Handbook and toolkit, all of which are inherently designed to be adapted and transferred to other regions and countries. This means that the materials developed can be easily tailored to local circumstances by other stakeholders, according to the chamber representatives of the consortium. The research adopts an end-user-centred approach, allowing companies to select and adapt EULEP training materials to meet their workforce's skill needs.

Regarding sustainability post-Erasmus+ funding, EULEP partners are encouraged to continue using the training materials and cooperation models developed during the project. They are looking into business models to sustain the training provision without relying on European funding. The aim is for the long-term integration of EULEP courses into national VET trainer programmes.

Regarding EULEP's potential for scalability and transferability, the project's methodologies and deliverables are designed to be adaptable and scalable to different contexts. Reports and guides are drafted to be easily used by other stakeholders and adapted to local circumstances, aiming to ensure that the project's outcomes can be replicated and scaled effectively.

⁷¹ <https://eulep.eu/activities/>

⁷² <https://eulep.eu/eulep-community/#project-partners>

12.5. Overall impact and lessons learnt

The main achievement of the EULEP project has been the development, implementation, and recognition of innovative, tailor-made training modules that directly address the evolving skill needs of SMEs in the areas of AI, VR and SI

This was made possible through the creation of a dynamic knowledge triangle linking SMEs, VET providers, and a European Digital Innovation Hub (EDIH). By fostering structured collaboration among these key stakeholders, EULEP is aligning training content with real market needs, ensuring both relevance and impact, according to the interviewed consortium partners.

Trainers benefit from upskilling opportunities and access to new training materials, particularly in areas like AI, VR, and SI. Businesses gain insights into skills demands and training needs through comprehensive skills intelligence and market research.

13. EUVECA – European Platform for Vocational Excellence in Health Care

13.1. About EUVECA

Background information

- **Project name:** EUVECA – European Platform for Vocational Excellence in Health Care
- **Duration:** 2022-2026
- **Call year:** 2021
- **Project status:** Ongoing

EUVECA is a CoVE led and coordinated by Region Syddanmark (Hospital of Southern Jutland with the support from South Denmark European Office).

It involves 19 partners across seven countries (Belgium, Germany, Ireland, Italy, Netherlands, Norway, Slovenia). The partners involved include healthcare providers, research and educational institutions, regional development agencies, and pan-European healthcare sector organisations⁷³.

Objectives of the CoVE project

The European healthcare sector faces six major megatrends challenging the sustainability of the European healthcare sector:

- **An ageing population:** Increased demand for healthcare due to a growing elderly population.
- **Chronic diseases:** Rising prevalence of long-term illnesses and multiple health conditions.
- **Digital transformation:** The shift to digital technologies in healthcare, requiring new digital skills.
- **Advancements in technology and biology:** Innovations in biotechnology and personalised medicine.
- **Modern health consumer:** More informed and proactive patients demanding patient-centred care.
- **Climate change:** The impact of environmental factors on public health and the need for sustainable practices.

These trends highlight the need for ongoing innovation digitalisation, efficiency, and greater staff and patient involvement to maintain high-quality care, patient safety, and economic sustainability to ensure the sustainability of the healthcare sector.

EUVECA supports this transformation by fostering future-oriented skills through Regional Vocational Excellence Hubs (RVEHs) in seven European regions. The initiative also promotes European mobility and interregional learning, enhancing collaboration among healthcare professionals and students.

By strategically integrating VET into regional health ecosystems, EUVECA demonstrates how vocational education can drive innovation and long-term sector sustainability at both European and regional levels.

⁷³ <https://euveca.eu/partners/>

13.2. Activities of EUVECA and skills developed

Activities covered

EUVECA brings together a multi-disciplinary consortium of healthcare professionals, VET providers, local and regional health authorities, regional development agencies, and social partners across seven European regions, supported by three Pan European partners: ESNO (European Specialist Nurses Organisation), EHMA (European Health Management Association) and ECHAlliance. These various stakeholders aim to co-create a governance model for the seven Regional Vocational Excellence Hubs (RVEHs) focused on strengthening VET within the health and social care sectors.

The RVEH governance model serves as a guiding framework for EUVECA activities. It is based on the following elements: Purpose, People, Process, Product⁷⁴.

- **Purpose:** The shared purpose of the seven RVEHs is to embed lifelong learning and CVET into existing regional health ecosystems with a focus on skills for the future, especially in the context of the green and digital transition, as a way to both retain health and social care workers and attract more people to health and social care professions.
- **People:** The seven RVEHs build on the ECHAlliance Regional Health Eco-system model, which brings together stakeholders in education and training, health and social care professionals, private companies, third sector organisations and policymaking institutions.
- **Process:** The RVEH governance model establishes a multi-level structure involving partners from education, healthcare, policy, innovation, and technology sectors. A facilitator group leads strategic planning, pilot coordination. Regional working groups address local needs through targeted VET activities. The model ensures inclusive collaboration, shared goals, and innovation in skills development.
- **Product:** Education and training activities are piloted and developed by the seven RVEHs, and then reviewed for inclusion on the Edu4Health platform⁷⁵ for VET course materials and other resources. These activities are part of the Testing and Implementation work package.

The Edu4Health governance model is directly linked to and built upon the RVEH governance model developed in EUVECA⁷⁶. Specifically:

- RVEHs serve as initiating partners and foundational structures for Edu4Health.
- RVEH members form the core of the Education4Health Steering Group, embedding regional priorities into platform governance.
- Education4Health acts as the European-level digital infrastructure that amplifies, connects, and sustains the work of the seven regional RVEHs.

The EUVECA partner institutions contribute to Edu4Health content and governance, and collaborate on research, VET, development and innovation. An Edu4Health Steering Group consists of representatives from Regional Hubs for vocational education and training in health care.

The two models are mutually reinforcing: RVEHs provide regional engagement and implementation capacity, while Education4Health provides a shared platform for visibility, scaling, and sustainability of VET excellence in healthcare.

⁷⁴ EUVECA Report: A Governance Model of Regional Vocational Excellence Hubs (RVEHs), May 2024.

⁷⁵ <https://edu4health.eu/>

⁷⁶ EUVECA Report: Governance Model for Education4Health, June 2024

Lastly, regarding governance and funding activities (Cluster 3), each RVEH will deliver a business plan and long-term governance framework by project end, ensuring sustainability. The overarching aim is to create lasting partnerships that promote vocational excellence and maintain the relevance of healthcare education and training across Europe.

Additionally, a sustainability business plan is being formulated for the Edu4Health platform. The project coordinating organisation is actively engaging with ECHAlliance, one of EUVECA's pan-European consortium partners, to explore the possibility of hosting the platform within ECHAlliance's network and offering it to the pan-European organisation's numerous regional health ecosystems.

Skills developed

EUVECA focuses on developing courses connected to the megatrends identified for the healthcare sector, addressing the evolving skill demands on practitioners and students. The courses are being developed on an initial skills-needs assessment that was conducted in the early stages of the project across the seven partner countries⁷⁷. This baseline assessment, involving over 3,600 healthcare students and professionals, as well as interviews and a comprehensive literature review, provides critical insights into the sector's preparedness for emerging megatrends. The findings highlight communication and collaboration as the most valued 21st century skills, alongside the need for enhanced training in ICT literacy, critical thinking, leadership, and climate-related competencies.

More specifically, the skills covered under EUVECA include:

- **Transversal skills** such as communication, teamwork, critical thinking, problem-solving, creativity, e.g., courses focused on essential communication skills for healthcare professionals relating to the patient-centred healthcare megatrend.
- **Occupation-specific healthcare skills**, including simulation training for healthcare professionals (e.g., chronic disease management, personalised care). These skills are essential for healthcare students and professionals to enhance their practical knowledge and expertise.
- **Green skills for sustainable healthcare**, which align with the principles of planetary health, which recognise the interconnectedness between human health and that of planetary ecosystems. The courses developed include an awareness course, leadership development, and a guideline for teachers to incorporate sustainable practices into their curriculum.
- **Digital health skills** relating to the use of AI in healthcare and technology competence. Emerging technologies such as VR are used for simulations and immersive learning experiences. This includes a patient room VR scenario and AI in healthcare courses developed by German partners. Slovenian experts contribute simulation training, with site visits to simulation centres incorporated into the programme.

All courses have been developed in a close interregional collaboration where all partners have participated, building on each other's experiences and competences. Unlike traditional VET quality frameworks, which emphasise immediate employability, VET excellence in the context of EUVECA focuses on long-term adaptability to emerging megatrends in healthcare (e.g., digitalisation, personalised medicine).

EUVECA's RVEHs serve as testing grounds for innovative training materials. The project also provides guidelines to help teachers and trainers effectively integrate these materials into their courses, enhancing the educational experience for students.

EUVECA enhances the professional development of educators and healthcare professionals by providing learning activities that strengthen their skills and knowledge. A key example is the V

⁷⁷ EUVECA Deliverable No. 1 – Baseline Report, April 2023: <https://euveca.eu/wp-content/uploads/2023/12/EUVECA-Baseline-Report-D1.pdf>

Model course⁷⁸, a structured training programme designed for teachers and trainers. Originally developed in the Netherlands, the course focuses on three core aspects – change, discovery, and confidence (*veranderen, vinden, and vertrouwen* in Dutch) – to equip educators with effective teaching and training strategies.

While EU frameworks like DigComp and GreenComp are not formally embedded, they inform discussions on the development of training and guidance for teachers and trainers. On digital competence, the RVEHs are particularly engaged in digital health solutions, emphasising e-health literacy, telemedicine, and AI-driven healthcare applications as core training areas.

Training materials under Edu4Health will remain publicly accessible during the project. Future access will depend on sustainability plans post-Erasmus+ funding. More specifically, the coordinating organisation is in dialogue with ECHAlliance to incorporate the platform into the pan-European organisation's regional offer and collaborate with all its member regions. ECHAlliance's sponsorship model is thus currently being considered as option.

13.3. Results expected and achieved

Contribution to the development of qualifications

The EUVECA project uses the European Qualifications Framework (EQF) as a common reference for developing the training courses, ensuring alignment with national qualification frameworks (NQFs) with the aim of proposing qualifications corresponding to the courses developed. This integration enhances transparency and consistency in training activities across different regions.

EUVECA aims to incorporate its learning activities into national curricula at EQF levels 3 to 8.. For working professionals, these activities may serve as extracurricular training to support continuous professional development.

A key initiative of EUVECA is the development of micro-credentials to support career mobility within healthcare. By integrating these credentials into NQFs, the project seeks official recognition, enabling professionals to build on existing qualifications rather than restarting their education. This is particularly relevant in countries like Denmark, where nurses transitioning to paramedic roles must restart their education entirely, creating a significant barrier. Recognised micro-credentials would ease such transitions, benefiting both employees seeking career progression and employers addressing workforce needs. This approach would also allow healthcare professionals to continuously upskill in response to technological and societal shifts, according to the project coordinator.

Additionally, these micro-credentials help bridge the gap between theoretical education and practical experience, supporting broader government recognition efforts, as explained by the project coordinator. Mobility activities are currently under development on the Edu4Health platform and will be offered to learners and professionals in healthcare once the EUVECA partner institutions have finalised their mutual agreements regarding learner mobility.

While EUVECA does not focus on private-sector qualifications or apprenticeship programmes, the RVEH in Germany is exploring their potential application within the project.

Contribution to enhancing the quality and attractiveness of VET

By strengthening partnerships between employers, educational institutions, and municipalities, EUVECA aligns educational programmes with workforce needs, ensuring easier role transitions and reducing skills gaps and labour shortages.

The healthcare sector faces significant challenges in this regard, particularly in adapting to new technologies, sustainability, and evolving patient needs. A major challenge is the high dropout

⁷⁸ <https://www.saxion.nl/onderzoek/health-and-wellbeing/technology-health-and-care/onderzoek/v-model-technologiecompetenties-van-zorg-en-welzijnsprofessionals>

rate of professionals. In Denmark, 25% of nurses leave the profession within five years, often due to the gap between theoretical education and practical work experience. EUVECA aims to reduce attrition by better preparing students for real-world challenges through simulation training, problem-solving activities, and scenario-based learning⁷⁹.

Addressing labour and skills shortages in the healthcare sector requires making VET a more attractive and viable pathway for both new entrants and existing professionals seeking career progression. EUVECA is actively working to improve the sector's appeal and retention by:

- **Developing micro-credentials to support career transitions**, enabling professionals – such as nurses – to upskill and transition into roles like paramedics without the need to restart their education.
- **Aligning training with emerging industry needs**, such as digital health, AI, and green skills, ensuring that healthcare professionals are equipped for the evolving landscape.
- **Bridging the gap between theoretical education and practical work experience**, reducing dropout rates and better preparing learners for real-world healthcare environments.

According to the project coordinator, 'VET excellence' in the context of EUVECA relates to the development of competences to facilitate easier career transitions within healthcare roles in the context of fast-paced technological and societal developments, differing from the traditional notion of VET quality, which often centres on standardised qualifications and training programmes without necessarily addressing such considerations.

The Edu4Health platform, the flagship initiative of the EUVECA project which officially launched in January 2025, aims to transform health education and training across Europe, making careers in the healthcare sector more attractive while enhancing the quality and accessibility of VET. By fostering collaboration and innovation, the platform aims to meet the evolving needs of European healthcare systems.

EUVECA's outcomes are expected to feed into EU healthcare policy, promoting sustainable healthcare systems through competence development and best practice sharing. Its micro-credentials, digital badges and RVEH innovative training initiatives will help recruit, train, and retain healthcare professionals, ensuring long-term sector resilience.

EUVECA supports national and EU policies, including the Pact for Skills, BeWell project, European Green Deal, and New Digital Strategy, by promoting green and digital skills. According to the project coordinator, EUVECA's focus on the green transition in healthcare aligns with EU sustainability initiatives, ensuring that future healthcare workers understand the environmental impact of healthcare services and can contribute to greener solutions. EUVECA also advances the EU Digital Strategy by developing micro-credentials and badges in digital skills, ensuring healthcare professionals are equipped for technological advancements.

13.4. Success factors

Added value of EUVECA

EUVECA is enhancing collaboration and knowledge sharing among its 19 partners across Europe, fostering a trans-regional approach to developing teaching and learning materials.

⁷⁹ EUVECA Deliverable No. 1 – Baseline Report, April 2023: <https://euveca.eu/wp-content/uploads/2023/12/EUVECA-Baseline-Report-D1.pdf>

By facilitating cross-sector dialogue, the project has broken down silos between education and the world of work within the healthcare sector, strengthening cooperation between VET schools, universities, and employers. This collaboration ensures that educational programmes align with workforce needs, optimising the use of expertise and resources. RVEHs play a key role in promoting stakeholder engagement, essential for building a sustainable skills ecosystem and strengthening the knowledge triangle. For instance, the EUVECA partners recently agreed to establish a dedicated network of simulation centres across the seven participating RVEHs, an initiative that would not have materialised without EUVECA.

EUVECA is to generate unique added value through its Edu4Health educational platform, which serves as a dedicated space for stakeholders involved in healthcare-related skills development. The platform enables these stakeholders to adopt best practices and draw from successful models for collaboration established within the EUVECA partnership, minimising redundant efforts and maximising efficiency. The Edu4Health platform's business and sustainability plan is being developed in collaboration with ECHAlliance. The primary goal is to integrate Edu4Health into the ECHAlliance regional network, expanding its reach across Europe. ECHAlliance's innovation subgroup aims to use Edu4Health to enhance inter-regional collaboration in health-related skills.

"What is really important, as we have seen in this sector, is that we try to break down silos so that educational offers become a bit more flexible. We have observed this across different regions, just the simple act of talking together more and trying to find more flexible solutions is truly beneficial."

EUVECA coordinators

Through the Edu4Health platform, healthcare students will benefit from cutting-edge training methods, including VR and simulation-based learning, which will enhance their practical skills and better prepare them for real-world challenges. Healthcare professionals, through regional hub participation, gain opportunities to upskill and reskill, helping to address skills shortages and improve recruitment and retention in the sector.

As explained by the project coordinator, the Edu4Health platform is envisioned to become a "reference" site for educational institutions within the ECHAlliance network, promoting transparency and the reuse of effective educational solutions in the European health education landscape. The expansion strategy for the Edu4Health platform will be guided by the tagline, "Join the community – benefit from a vast pool of knowledge and save time." However, this approach is still under development as we refine the concept to effectively engage the broader healthcare professional community across Europe.

Moreover, EUVECA aims to enhance recognition and relevance of healthcare qualifications, making graduates more employable. Healthcare institutions, in turn, will benefit from a more skilled, adaptable workforce, ensuring that healthcare professionals are better equipped to meet evolving sector demands.

Therefore, EUVECA is actively contributing to a more resilient and future-ready healthcare workforce across Europe.

Potential for sustainability, scalability and transferability

The sustainability of the EUVECA project post-Erasmus+ funding is being explored through dedicated work packages focusing on strategy, dissemination, transferability, and financial viability. Each RVEH is developing a sustainability strategy and business plan, with ongoing discussions expected to refine these in the coming months.

The long-term viability of the Edu4Health platform will depend on attracting users through high-quality learning content and mobility opportunities, ensuring a critical mass of engagement.

Potential funding sources include future Erasmus+ projects or alternative financial models. One option under discussion is a fee-based participation model for the RVEHs, which could place some content behind paywalls, while keeping access free for individual learners. To further strengthen sustainability, EUVECA is collaborating with the ECH Alliance as a CoVE partner, leveraging its network of regional health ecosystems. Integrating the platform into the ECH Alliance's existing structure could provide continued access for its member regions while enhancing financial stability. While public accessibility remains a priority, a subscription model for institutions may be necessary to support long-term operations.

“The most promising aspect of the Edu4Health platform is the learning material related to mobility opportunities. So, if the project gets that part right, there are very high expectations for the platform because, in that respect, it will really stand out from anything even seen in the healthcare sector.”

Edu4Health platform developing partner

It is still too early to determine the financial sustainability of EUVECA beyond Erasmus+ funding. As the project progresses, evaluating engagement levels and refining meeting formats will be crucial to maintaining stakeholder involvement.

The Edu4Health platform has scalability and transferability potential beyond the seven RVEHs, according to the project coordinator. Built on Moodle, a flexible learning management system, it can be adapted for other sectors beyond healthcare. Additionally, micro-credentials developed through the project aim to close skills gaps, support career transitions, and ensure healthcare professionals are better prepared for real-world challenges.

Importantly, EUVECA places a strong emphasis on sustainable collaboration. While many Erasmus+ projects develop platforms that function merely as digital repositories for learning materials – often becoming inactive post-project – EUVECA is dedicated to ensuring long-term impact by exploring sustainable solutions to maintain partnerships beyond the project period. It facilitates broad engagement with a wider network of regional and European partners, extending beyond the mere development of training materials to building ecosystems and fostering long-term partnerships.

13.5. Overall impact and lessons learnt

EUVECA is fostering strong collaboration among the 19 partners across Europe, having led to the establishment of seven RVEHs. These hubs unite healthcare education providers, healthcare institutions, and other stakeholders to address skills gaps and enhance training quality. They are actively developing innovative teaching materials and integrating advanced training methods such as virtual reality and simulation training. By breaking down silos, EUVECA has strengthened communication and cooperation across the healthcare sector.

A key milestone for EUVECA will be the successful integration of mobility opportunities with high-quality learning materials on the Edu4Health platform. Achieving this could ensure long-term impact, making the platform a valuable resource for years to come.

14. FEA-VEE – Fashion Earth Alliance – Vocational Excellence and Enterprise

14.1. About FEA-VEE

Background information

- **Project name:** FEA-VEE – Fashion Earth Alliance – Vocational Excellence and Enterprise, Enterprise united for training, policy reform and sustainability in the fashion, textiles and apparel industries.
- **Duration:** 2022-2026
- **Call year:** 2021
- **Project status:** Ongoing

FEA-VEE is a CoVE led and coordinated by the Technical Institute of Heraklion Chamber in Greece.

The partnership includes 12 members from 6 European countries: Greece, Spain, Bulgaria, Romania, Germany, and Sweden. The partnership involves a mixture of vocational education and training providers, chambers, higher education institutions, fashion associations/networks and NGOs. At project conception the aim was to have one educational or training provider and one organisation that focuses on the business and industry side in each partner country.

Objectives of the CoVE project

According to the European Commission, there are 5 million people directly employed in the fashion value chain, providing an important contribution to the EU economy. The intimately related textiles and clothing sectors play a significant role in European manufacturing industry, employing 1.7 million people. The EU Single Market is also one of the most important in terms of size, quality and design.

The project arises from the fashion and textile industry needs, to overcome the various challenges related to the skills gap between existing training programmes and sector transition towards more sustainable and digital economic models.

Main objectives:

- To attract more young people in the fashion, textiles and clothing sectors, and thus, offering a new workforce that is VET recognised, skilled and competent for the 21st century labour needs, trained through work-based training and internships in direct liaison with the industry.
- To contribute to the development of greener, more circular and sustainable economic models in the fashion, textiles and clothing sectors, as well as more ethical and concentrated on fair trade values.
- To establish a Green Entrepreneurship policy reform pathway aiming to incorporate sustainability concerns within entrepreneurial planning.
- To support entrepreneurship through start-ups and incubation.
- To enhance entrepreneurial skills and competences among the current and future workforce.

The FEA-VEE project is focused on the creation of a network of regional Centres of Vocational Excellence (CoVEs) composed of VET providers, and industry representatives (Chambers, Associations, companies, business support organizations etc.).

FEA-VEE cooperate both at regional and at international level to:

- Identify future skills needed by the fashion industry.

- Develop new and modify existing training programmes accordingly.
- Make a career in the fashion industry more appealing for young people.
- Contribute to the development of greener and more sustainable economic models in the sector.

14.2. Activities of FEA-VEE and skills developed

Activities covered

There is a mix of VET providers and universities involved in FEA-VEE as project partners, as well as chambers and business associations.

When launching the project, FEA-VEE interviewed local stakeholders, target groups and potential beneficiaries for their input. From this initial round of interviews, FEA-VEE have built their network and tried to establish themselves nationally through the partners and organisations identified in this stage, across the following three areas

- Trainers, educators and professionals.
- Learners and students.
- Business stakeholders in the fashion industry.

FEA-VEE now use this network for disseminating and promoting project activities, including international study visits providing opportunities for exchange of skills, cultures, and experiences among participants, which have been made possible through these connections. These connections have been made more credible by the support and recognition of the project by the European Union.

The role of higher education (HE) institutions in FEA-VEE is to raise standards, and ensure all learners have the same skills. There is an awareness that HE and VET cannot function independently of one another' they need each other and, together, their future alumni can have a positive impact in the fashion industry, supporting FEA-VEE project objectives.

Some of the specific activities can be summarised as follows:

- **Teaching and Learning:** FEA-VEE have developed curricula for students, training materials for teachers, facilitate internships and international study visits as part of their teaching and learning work package. Two HE partners (one from Spain and another from Romania) have helped with the development of curricula including training materials. Having professionals with strong academic knowledge from these partners was indispensable in this activity as well as other areas. Resources developed were: 3 Courses & 3 Self-assessment tools for teachers and trainers and 3 Courses & 3 Self-assessment tools for students and graduates, Textbook for Teaching Sustainability in the Fashion and Textiles Industries.
- **Cooperation and partnerships:** The FEA-VEE project allows for cooperation and exchanges between VET providers at different levels and industry representatives. The flow of cooperation between diverse actors is established by two main pillars: a) a common understanding and agreement on future shared strategies and activities, and b) facilitated actions via an online networking platform for initiating and maintaining collaborations and learners' mobility. The first activity of FEA-VEE was to conduct interviews and focus groups to get feedback and input from local stakeholders and potential beneficiaries to help shape the CoVE, establishing it as a cooperative project from the beginning.
- **Governance and funding:** An Online Transnational Cooperation Platform is one of FEA-VEE's key deliverables, described by the project coordinator as "*the LinkedIn for fashion learners and providers*". Through this platform, providers, learners and/or SME's can create a profile, which primarily informs individuals on national internships and international study visits. Learning materials (external to the project) can and are also

be uploaded to the platform by partner organisations; these are monitored by specific tools including AI to ensure what is being uploaded is fitting and appropriate. This platform has enabled the set-up of a network for national apprenticeships for students and a network for transnational student mobility abroad. This platform is key for the governance of FEA-VEE's activities.

Skills developed

"Fashion designers' skill sets are like a tapestry, that is woven thread by thread."

Education partner

Each thread represents a multitude of skills needed in the fashion industry including artistic vision, technical proficiency, digital awareness, sustainable practice and entrepreneurial know-how.

The FEA-VEE CoVE project was based on two major skills mismatches existing in the Fashion Industry: digital skills and green skills.

- **Digital skills** in the Fashion and Textiles industry are particularly low in countries that used to have a traditional fashion industry based on inter-generational learning rather than formal education and training. The project focuses on increasing sector specific digital understanding including the way its use has changed in the industry i.e., away from heavy machinery to things like 3D printing. FEA-VEE has connected online interns (those only able to work remotely) with specific projects that they could benefit from the most, such as graphic design, which is web based, not requiring to be taught in-person but harnesses specific digital design skills. FEA-VEE have modules related to digital skills (including VR and ER), but there is an awareness that there needs to be a balance maintained between use of digital tools and people due to fashion and textiles being a creative industry. If too much digital technology is used then the pieces created have no feelings/emotions or stories to tell, according to an educational partner and teacher with decades of experience in the industry. There is skill in knowing how and when to include digital, and a caution not to create everything with it, FEA-VEE seeks to teach this.
- FEA-VEE's **green skills** focus is based on the fact the fashion industry is one of the most polluting in the world with a lot of waste being created from both fast fashion multinational chains. Modules on green entrepreneurship strive to help people to learn how to establish their own businesses in fashion through green principles and circular models that have a good environmental footprint. Green entrepreneurship is something focused on due to an identification in Europe that during the last decade many local suppliers have ceased their businesses due to growing production made in countries outside of the European Union where there is cheaper labour. FEA-VEE are encouraging smaller start-up businesses to try build some of this back as they see it as a vital part of the industry, by developing green entrepreneur modules to promote this in a sustainable way.

FEA-VEE follow closely all the EU policy developments and frameworks including the most recent Union of Skills to see how their practices can be updated to reflect new changes. FEA-VEE are a part of the Pact for Skills and European Alliance for Apprenticeships. FEA-VEE are committed to making sure they use all the available tools and opportunities, according to the project coordinator. One tool that FEA-VEE actively makes use of is Europass Mobility for learners taking part in international study visits.

Methods for developing the skills outlined above are discussed below:

- National internships followed by international study visits were used as a springboard for sharing the creative curricula within and across partner countries. Internships fosters connections between business and professional stakeholders and education stakeholders, which will hopefully be long standing due to cooperation required to offer learners opportunity for practical insights into companies that align with curricula

teaching. Due to the time launch of the project this worked on a hybrid model with a mix of online and physical environment.

- In Romania, for example, five students went to different factories that mass produce fashion and to small ateliers that do custom made or sustainable garments. This was to show how the FEA-VEE project is aimed at the middle of the two, getting learners to begin thinking about where aspects of both can be combined together.
- International study visits were recalled as the most innovative activity undertaken by FEA-VEE. These involve (on two separate study visits – one in Spain and one Germany) 10 individual learners per partner country making 120 learners in total across the two organised visits. Offering networking potential, development of social skills and English language skills.
- When developing the curricular, FEA-VEE made two strands, the first for students and learners and the second for teachers and trainers, to upskill and reskill based on new information, trends and methodologies in the industry.
- Training and learning materials developed are all available on the FEA-VEE website including copies in every partner country language plus English (seven languages in total). This was a huge task and involved close collaborative work. The main benefit of translation into each language is to enable increased potential for impact in each partner country as for example in Greece, very few HE or VET centres teach in English so it would have been difficult to get buy in from providers without having a Greek version accessible.

14.3. Results expected and achieved

Contribution to the development of qualifications

FEA-VEE has developed training materials for both teachers/trainers and students/learners. These are not recognised by an official body as it was not in the original scope of the project to have a specialised partner to perform this aspect. The onus therefore is on HE and VET providers to integrate the training materials into existing curriculum, which has been achieved, enhanced potential achieved by the translation into different partner languages.

FEA-VEE have a specific work package/policy brief for the materials developed and research done in collaboration with beneficiaries and target groups in each country and desk research at European and international level to capture the needs of the new and future workforce. Based on this research FEA-VEE use a list of national policy makers, decision makers and educational authorities' stakeholders in each country. It can be difficult to get true engagement and listening if they do not have something to direct gain from due to their own capacity, resources and focus area priorities. FEA-VEE do not have official national policy partners but have Chambers who for example in Greece have social partner connections because they are public serving. In Greece the Chambers play a social role in connecting to Ministries and other educational authorities. Though this experience is not the same in all countries.

No micro-credentials have been developed but is in discussion internally to be in scope for a potential follow up project in future that could be focused on this.

FEA-VEE use Europass to shape mobilities skills but that is not directly connected with the NQA for the EQF because they do not have the authority to do this. This is potentially something that they will work on for future initiatives.

Feedback from the 30 internship students were all positive for their experience, even without EQF certification it was still highly valued as beneficial to work experience.

Contribution to enhancing the quality and attractiveness of VET

Improving the attractiveness of VET for FEA-VEE is linked to is in the dissemination and the promotion activities as it is important to clearly communicate what you do. With a wealth of

information and noise in today society, it can be hard to decipher what is useful and not. The CoVE is recognised by the European Union which holds weight, the courses are paid and therefore free to the end user, and the training materials accessible forever in multiple languages.

Tangible impact of FEA-VEE includes:

- The development of the curriculum that has been or has plans to be integrated into each countries learning programmes and schemes by the end of the CoVE project. Through the curricular created, FEA-VEE promote green and circularity concept of the fashion and textiles industry i.e., how to reuse materials, how to develop biomaterial with textiles and thread etc
- Experiences gained by learners participating in internships and those due to take part in the international study visits. One upcoming study visit, organised in Spain by the Polytechnic University of Catalunya, is due to focus on training and educational skills in the textiles industry and another hosted by the Italian/German Chamber of Commerce in Germany that will focus on green entrepreneurship.
- A second project which some FEA-VEE partners participate, is planning to use the same Online Transnational Cooperation Platform developed by FEA-VEE. This project is funded by the Alliances for Innovation Erasmus+ to expand the number of persons registering to the platform and keep it 'alive' for as long as possible.

The CoVE has addressed **skills gaps and shortages**; by inviting potential learners, teachers and other stakeholders to sign up to their Online Transnational Cooperation Platform, which straight away gets them in touch with technology. This engagement increases their basic digital understanding and skills, as there are many stakeholders in higher age groups in fashion and textiles industry that do not use those kinds of tools very much. This links/promotes into one of the VET objects of Lifelong Learning, constant need to upskill as go through life and new tools come out to stay in the game

Being a part of a CoVE for FEA-VEE has helped to form **stronger partnerships with key stakeholders** due to the structure of the project. It is large and has a four-year duration, meaning stakeholders want to invest in the project, making it easier to establish stronger relationships and encourage them to participate in your activities as these can be nurtured over a longer time period than ones with a more typical one year duration. By engaging their time in interviews and focus groups at the start of the project, stakeholder felt they were all included and part of the inception of the project, whilst also gaining networking potential and enhancement of skills in the industry as the FEA-VEE project progresses. The CoVE project has helped in this direction for all partners in all six countries.

Upward convergence is seen in the case of Sweden and Germany, the COVE partners have gained from their more advanced knowledge in green awareness. Teaching and training professionals helped to exchange ideas, the exchange between partners and countries is very clear.

The project coordinator has reviewed the European Union Green Deal and the new Digital Strategy, in which many of the key tangible outputs and deliverables of FEA-VEE contribute to direction of these EU strategies. FEA-VEE invites and looks for new SMEs to collaborate with and promote recycling and upcycling of the fashion industry and they work to enhance the digital competency of all beneficiaries, which support implementation of EU strategies like Communication on attracting Skills and Talent, and the new SME Strategies.

Multiplier events are held in each country, attended by a range of stakeholders, warm appreciation has been received following these events including additional support in FEA-VEE offered by strategic partners, such as in Romania. Each country is encouraged to make their own stamp on their events i.e., Bulgaria involving a competition element.

14.4. Success factors

Added value of FEA-VEE

The use of international study visits has added value, as these would not have happened if not part of a CoVE. These study visits would not be possible without cooperation across EU countries, enabled by being part of the CoVE project which is promoted by the European Union as something they want to see, an exchange of learners, trainers and skills. Having 60 learners at one time from across 6 countries moving to another for a whole week (twice) is not simple, this experience will give an incentive to the participants both learners and participating organisations to be motivated to organise more similar activities in future, either through other EU projects or outside of EU projects. International level exchange promotes sharing of cultural and social skills which the project coordinator sees as very important for learners and new entrepreneurs.

Most significant benefits to specific stakeholder groups are the project experience, no matter how short or long. The project manager flagged that it is not possible to have completely the same individuals involved across all 4 years of the project as the project evolves including locations changing and people change direction. Therefore, the networking opportunities and structures developed have been successfully built to withstand these internal changes across partner countries. Examples of enabling factors include networking from the beginning of the project, development of training materials halfway through and development of the international platform available worldwide in 7 languages. Practical experiences and exchanges in Spain and Germany all add value, only made possible due to being a CoVE and its ability to fund and foster cross-nation collaboration.

Key benefits for the wider sector include awareness, everyone in the fashion and textiles sector discusses how polluting the sector is but not everyone realises ways for example to use a 3D printer for recycling some materials is not as costly as expected. Some in the industry have not separated the idea of using digital tools and mechanisms with large machinery used historically in fashion and textiles factories. It is not like this anymore as new technology is a lot more approachable and user-friendly which FEA-VEE try to provide awareness that green and digital can go hand in hand, enabled by the exchange of good practices from country to country – Sweden and Germany lead the way but also Spain.

Additional benefits of the CoVE's international dimension bring to FEA-VEE's work on vocational excellence include not just the participants of the international study visits but also of the sending organisation or partner organisations. One specific benefit is getting in contact with a lot of interested persons (20+ people applied in Greece for 10 spots), which they have to make a selection based on objective criteria i.e., previous study, use and understanding of English and availabilities, and gender balance. This selection process is an 'enlightening' activity, highlighting scope of learner interest and demand including demographic trends.

Potential for sustainability, scalability and transferability

The Online Transnational Cooperation Platform will be financially sustainable without Erasmus+ funding because all partners have the motivation to keep it. FEA-VEE has found a smaller window to include this platform into another project as previously mentioned, that has more structured means to sustain it.

The curriculum and modules developed have and will continue to be utilised by partners as is externally available on their website. Durability of this aspect will only go so far as technology and skills continue to advance so rapidly which may mean without future funding to update them, in 5-10 years parts may be outdated. FEA-VEE are taking this into account when planning their next steps.

The University of Art and Design of Cluj-Napoca are welcoming anyone to donate stock fabrics, threads, sewing machines or any materials that are being thrown out or are no longer being used. This practice is diminishing the cost of learning and showing student's firsthand

sustainable practise. This builds a network to sustain some of these circular practises beyond the end of the official project.

The outcomes of the CoVE project will be replicable or scalable and transferable to other contexts to a 'large extent'. In the grand scheme of CoVE's six countries is not that many, so FEA-VEE have tried to expand their impact as much as possible. They have used 'easy routes' such as countries like Cyprus where Greek is the official language and Italy as they have the German/Italian Chambers that is based in Germany, but this is a bilateral chamber. Most of their materials are also translated into Catalan as two partners are based in Barcelona, which opens up opportunities to different audiences. FEA-VEE has plans in the works to expand even more and appeal to other countries with a potential follow-up initiative.

Higher education institutions and secondary VET cooperate as equals in the consortium. Both types of learning institutions have differences both methodologically and structurally whilst also having much common ground in which they can find cooperation potential and exchange knowledge between each other. Communication and exchanges at local level with organisations outside of FEA-VEE's consortium work to expand CoVE's reach in each country. The international study visits have open calls for participation, not restricted only to the project partners which usually would be the case on other projects.

14.5. Overall impact and lessons learnt

When finalised the biggest achievement will be the international study visits. The current biggest achievement is the fact that there are so many teachers/trainers and students/learners showing their interest in participation in FEA-VEE's activities. This shows FEA-VEE that they have a real impact on individuals across the project countries, particularly through open calls for participation which are not based on nationality but residency. FEA-VEE hope their reach can be multiplied even more after the first international study visits take place in Barcelona region, Spain, which will primarily be measured by volume of applications for the second round of study visits that will take place late October 2025 in Stuttgart region, Germany. FEA-VEE are proud to represent a domain that is not as promoted or showcased in European projects, which is Fashion. When starting in 2022 this was even less so, FEA-VEE have noticed an impact on this already, as the project coordinator has seen more and more initiatives crop up in this area during the last few years. In Romania students have demonstrated applying research into other areas, integrating a part of what they researched and studied together in FEA-VEE to creating and maintaining sustainable practice going forward.

"The fashion industry is the second biggest pollution industry, so every small step taken can help in the future to diminish the problems that are already created."

Education partner

15. GIVE – Governance for Inclusive Vocational Excellence

15.1. About GIVE

Background information

- **Project name:** GIVE – Governance for Inclusive Vocational Excellence
- **Duration:** 2020-2024
- **Project call year:** 2020
- **Project status:** Completed

GIVE was a Centre of Vocational Excellence (CoVE) coordinated by Cometa Formazione in Italy. It involved 12 partners across six countries (Italy, Romania, Finland, Malta, Belgium, and Spain). The partners included VET providers (e.g. MCAST), higher education institutions (e.g. University of Bucharest), transnational networks (e.g. EfVET), private training and inclusion centres (e.g. Lantegi Batuak), and regional development and policy actors, reflecting a cross-sectoral and inclusive partnership model.

Objectives of the CoVE project

GIVE (Governance for Inclusive Vocational Excellence) aimed to design and develop a European platform of Centres of Vocational Excellence dedicated to innovation in the VET sector for the social inclusion of individuals from disadvantaged groups. These groups include people with a migration background, disabilities, low skills or obsolete qualifications, early school leavers, those with special learning needs, and individuals from challenging socio-economic backgrounds.⁸⁰

The CoVE was structured around three main strategic objectives:

- Developing entrepreneurial governance models (best practices) for the creation and management of inclusive VET centres and agencies.
- Promoting educational approaches and tools that support social inclusion through personalised training, international mobility, and improved access to employment.
- Designing and implementing effective training-to-work transition models, including guidance and counselling schemes co-developed by VET providers and companies.

These objectives aligned closely with the Erasmus+ programme's priorities on inclusion and diversity, as well as the broader EU goal of establishing skills ecosystems that foster social equity and economic integration. The GIVE CoVE also supports the concept of Vocational Excellence by bringing together VET centres, higher education institutions, businesses, and regional authorities to develop innovative, scalable, and transferable models.⁸¹ These models were not only conceptual but were piloted and institutionalised within local contexts – for example, in Italy and Romania, GIVE training modules were embedded into staff development programmes; in Malta, elements of the inclusive training approach were adopted into mainstream provision and guidance services. The project also led to the development of a portfolio of best practices which were designed to be transferable across national and sectoral contexts. Interviewees noted that these practices enabled a more joined-up and inclusive approach to vocational education, particularly in supporting transitions to work for

⁸⁰ Erasmus+ project fiche: GIVE – Governance for Inclusive Vocational Excellence (ID: 621199-EPP-1-2020-1-IT-EPPKA3-VET-COVE), available at: <https://erasmus-plus.ec.europa.eu/projects/search/details/621199-EPP-1-2020-1-IT-EPPKA3-VET-COVE>

⁸¹ GIVE project website: <https://www.thegiveproject.eu>

disadvantaged learners. The emphasis on multi-stakeholder collaboration and personalised learning pathways also reflects EU strategic priorities for inclusive growth and lifelong learning.⁸²

15.2. Activities of GIVE and skills developed

Activities covered

The GIVE project implemented a structured set of activities across three thematic clusters: (1) teaching and learning, (2) cooperation and partnerships, and (3) governance and funding. Each cluster contributed to strengthening inclusive vocational excellence and supporting the transition of disadvantaged learners into employment and further education.

Cluster 1: Teaching and learning

The GIVE project focused heavily on developing pedagogical models that support inclusion in VET settings, particularly for learners facing social, economic, or educational disadvantages. Across participating countries, activities under this cluster included the design, testing, and dissemination of didactic approaches tailored to specific learner needs.⁸³ Partners developed and piloted modular training content and structured learning pathways aimed at trainers, tutors, employers, and public sector professionals. These were made accessible via a multilingual online training platform, enabling remote and inclusive learning across varied institutional and national contexts.⁸⁴ Interviewees noted that piloting such training packages in different countries revealed the value of adaptability in content delivery—especially when supporting students with cognitive or physical disabilities.⁸⁵

"We developed a concept of inclusive excellence as an ecosystem... designed and implemented to ensure that all people are included – not only learners, but also teachers and trainers – regardless of their specific disadvantage."

Project coordinator

The inclusive pedagogical tools were built around three core principles: personalisation, work-based learning, and guided transitions to employment. The emphasis on personalised support and real-world employability was especially important for centres like Lantegi Batuak, which operates as a sheltered employment provider for people with disabilities.⁸⁶ Additionally, GIVE produced digital enablers to extend access and support learning mobility. These included a Digital Mobility Marketplace for inclusive transnational mobility offers and a Community of Practice for peer-to-peer knowledge exchange among VET professionals.⁸⁷

Cluster 2: Cooperation and partnerships

GIVE promoted transnational and cross-sectoral cooperation to build inclusive VET ecosystems across participating countries. A key focus was placed on co-creation and collaborative design of pedagogical tools, curricula, and services involving VET providers, employers, higher education institutions, and civil society organisations. This approach supported a more ecosystemic model of VET, aligning with the Centres of Vocational Excellence concept promoted by Erasmus+.⁸⁸

"The GIVE platform created meaningful engagement between VET providers and HE institutions, enabling joint development of inclusion-focused pedagogies and institutional learning."

Project partner (University of Bucharest)

⁸² GIVE Academy platform: <https://giveacademy.eu>

⁸³ GIVE Final Project Summary Report, 2023, available via <https://www.thegiveproject.eu/>; also ICF interviews with Project coordinator.

⁸⁴ See GIVE Online Platform Overview, accessible via <https://giveacademy.eu/>.

⁸⁵ ICF interview with EFVET and Lantegi Batuak representatives.

⁸⁶ ICF interview with Lantegi Batuak representatives

⁸⁷ ICF interview with EFVET representative

⁸⁸ GIVE Project Summary; ICF interview with Project coordinator

Partnerships were operationalised through activities in each country, mapping out cooperation modalities and engagement strategies with local actors beyond the core consortium. For instance, local public authorities, NGOs, and businesses were consulted in the development of training pathways and transition-to-work models, ensuring relevance and inclusion. As noted in interviews, active involvement of employers was crucial to link personalised training with real job opportunities.⁸⁹

Higher education institutions also contributed to applied research on inclusive methodologies and supported the integration of these approaches in teacher training.⁹⁰ Interviewees highlighted that cooperation between VET providers and universities enhanced both the academic rigour and practical orientation of the project's outputs. The GIVE project also fostered a Community of Practice through its online platform, facilitating peer exchange and joint problem solving across various locations.⁹¹ Transnational workshops and dissemination events, such as the GIVE Academy and the final conference, further supported the spread of inclusive VET practices at EU level.

Cluster 3: Governance and funding

GIVE placed strong emphasis on the development of entrepreneurial governance models to guide the creation and management of inclusive VET centres. In the context of GIVE, this referred to governance approaches that are strategic, adaptable, and proactive in mobilising diverse resources and partnerships—borrowing principles from entrepreneurial thinking to improve VET responsiveness and innovation. The aim was to strengthen institutional coordination, sustainability, and alignment with the needs of disadvantaged learners and the labour market. To achieve this, partners co-developed a governance framework based on four pillars: mission alignment, multi-level stakeholder engagement, inclusive leadership, and resource mobilisation strategies. These components were formalised in GIVE's Blueprint for Inclusive Vocational Excellence and validated through peer review with external experts and policy stakeholders. The aim was to strengthen institutional coordination, sustainability, and the responsiveness of VET provision to the needs of disadvantaged learners and the labour market.⁹²

Partners co-designed a governance framework based on four pillars: mission alignment, multi-level stakeholder engagement, inclusive leadership, and resource mobilisation strategies. These were detailed in GIVE's Blueprint for Inclusive Vocational Excellence and validated through peer review activities with external experts and policy stakeholders. The project also addressed sustainability by preparing a policy roadmap for the institutionalisation of inclusive practices at regional and national levels. This included recommendations on how to adapt funding models (e.g., through public-private partnerships or social impact schemes) to support long-term VET provision for vulnerable groups.

Skills developed

The GIVE project focused on equipping both learners and professionals with inclusive, work-relevant skills tailored to the needs of disadvantaged groups. For learners, the emphasis was on developing foundational, technical, and transversal skills that support integration into the labour market, with particular attention to individualised learning needs. The training paths addressed digital competences, communication skills, job readiness, and vocational capabilities linked to local employment sectors, including care, hospitality, administration, and manufacturing. These were embedded in modular work-based training formats piloted across the partner countries.⁹³

⁸⁹ ICF interviews with GI Group and Lantegi Batuk representatives

⁹⁰ For instance, the University of Bucharest was mentioned during the interviews as contributing to the evidence base.

⁹¹ ICF interviews with University of Bucharest and MCAST representatives

⁹² ICF interviews with University of Bucharest, MCAST, and Lantegi Batuk representatives

⁹³ ICF interviews with MCAST and Lantegi Batuk representatives

To support delivery, the GIVE CoVE also prioritised the upskilling of VET professionals. Trainers, tutors, and job coaches were offered targeted training in inclusive pedagogical practices, such as managing diversity in the classroom, designing personalised learning plans, and supporting learners with disabilities or socio-economic disadvantages. The GIVE e-learning platform included dedicated modules on universal design for learning (UDL), employability pathways, and inclusive digital instruction, developed collaboratively by project partners including Cometa and the University of Bucharest.⁹⁴

"We've taken steps to embed GIVE's content into our continuing professional development for tutors, and we're exploring how to integrate parts of it into our national VET strategy."

Project coordinator

Importantly, the GIVE project also supported inter-institutional learning among project partners through peer exchange and joint workshops. These exchanges fostered capacity-building around skills intelligence, labour market alignment, and co-design of training offers with employers. Some interviewees noted that GIVE helped create "a shared skills language" among stakeholders working on social inclusion and VET innovation.⁹⁵

15.3. Results achieved

Contribution to the development of qualifications

The GIVE project contributed to the development of new inclusive training modules and structured learning paths, primarily for professionals working with disadvantaged learners. While the project did not aim to create formal qualifications registered in national qualifications frameworks, it developed training content that could be embedded into existing qualifications or used in Continuing Professional Development (CPD) offers by VET providers. Expected outcomes included a modular curriculum for VET trainers, coaches, and tutors, with a focus on inclusion, guidance, and work-based learning. These modules were developed and piloted across countries such as Italy, Malta, and Romania, and supported by an online platform with multilingual access and adaptive learning options.⁹⁶

Achievements included:

- A set of pilot-tested, non-formal training modules on inclusive pedagogies, guidance and counselling, and transition-to-work models.
- A Digital Mobility Marketplace, which enabled educators and learners to explore transnational training opportunities and exchange practices.
- A digital Community of Practice, offering ongoing peer support and content updates for VET professionals interested in inclusion.

The GIVE consortium reported that the developed training resources were integrated into staff development programmes at several VET institutions (e.g. MCAST, Lantegi Batuak) and are under consideration for future accreditation or certification pathways at national level, also through the GIVE academy.⁹⁷

Contribution to enhancing the quality and attractiveness of VET

The GIVE project was designed to increase both the quality and social relevance of VET provision for disadvantaged groups. The expected results included improved institutional capacity to serve diverse learner groups, strengthened cooperation between education providers and employers, and greater alignment of VET offers with local labour market needs.

⁹⁴ ICF interviews with University of Bucharest representatives

⁹⁵ ICF interview with MCAST representatives

⁹⁶ ICF interviews with Project coordinator and MCAST representatives

⁹⁷ ICF interviews with Project coordinator, MCAST and Lantegi Batuak representatives

Achievements against these goals included:

- Enhanced pedagogical quality, with several partners adopting GIVE's methods for personalised learning as part of their mainstream provision⁹⁸.
- Increased institutional awareness and responsiveness to learners' social inclusion needs, supported by GIVE's governance model and community engagement activities.
- Positive learner feedback on the flexibility and relevance of the training approaches piloted, particularly in terms of building confidence and employability among vulnerable youth.
- Stronger VET–employer linkages, including co-design of learning paths and participation of companies in training delivery, especially in Italy and Spain⁹⁹.
- The establishment of the GIVE Academy, which provides continuous training on inclusivity and associated best practices.

"We didn't want a project that would finish with a report. GIVE built real capabilities in people and institutions, and that's what makes it sustainable."

Project partner (EfVET)

"It wasn't just knowledge transfer; it was co-creation."

Project partner (MCAST)

Stakeholders reported that GIVE helped “*put inclusion on the agenda*” of mainstream VET providers, while also building a sustainable knowledge base for future projects in inclusive VET ecosystems.¹⁰⁰

15.4. Success factors

Added value of GIVE

The GIVE project's main added value lay in its focus on inclusion as a systemic feature of vocational excellence. By designing governance models and pedagogical frameworks specifically aimed at supporting disadvantaged learners, the project filled an identified gap in existing VET platforms and CoVEs, which typically do not embed inclusion as a central theme.¹⁰¹

Partners reported that the CoVE structure – characterised by its multi-level, cross-sectoral, and long-term partnership model – was crucial in enabling deeper and more sustained collaboration than typical short-term Erasmus+ projects. This structure facilitated the co-design and pilot-testing of tools across different institutional and national contexts, allowing partners not only to exchange practices but also to jointly refine and embed them within their own systems. For example, the collaborative development of non-formal training modules on transition-to-work and inclusive counselling was cited as a key output that depended on sustained input from both VET and higher education partners, as well as the iterative validation process enabled by the CoVE framework.¹⁰²

Higher education institutions such as the University of Bucharest highlighted that the GIVE platform created meaningful engagement between VET providers and HE institutions, enabling joint development of inclusion-focused pedagogies and institutional learning¹⁰³. This was echoed by stakeholders in Malta, who emphasised that participation in GIVE introduced them to peer VET ecosystems in other countries, allowing them to adapt new inclusion strategies and

⁹⁸ ICF interviews with University of Bucharest representatives and other partners

⁹⁹ ICF interviews with GI Group and Lantegi Batuk representatives

¹⁰⁰ ICF interviews with Project coordinator and EfVET representatives

¹⁰¹ ICF interviews with Project coordinator

¹⁰² ICF interview with MCAST representatives

¹⁰³ ICF interview with University of Bucharest representative

digital platforms for their local systems¹⁰⁴. Moreover, several interviewees noted that the CoVE created a community of practice across different institutional levels—policy, provider, practitioner—which has continued to exist informally following the end of the funded period.

Potential for sustainability, scalability and transferability

The GIVE project was explicitly designed to generate tools and models with high potential for sustainability and replication. Interviewed partners consistently highlighted that GIVE's approach – focused on *“inclusive excellence”* rather than *“generalised excellence”* – filled a systemic gap in the VET landscape and offered a concrete platform for sustained institutional learning and capacity-building across countries.¹⁰⁵

In terms of sustainability, multiple partners reported that key project outputs were already being institutionalised. In Italy, for instance, GIVE training modules on inclusive pedagogies and work transition guidance were incorporated into the ongoing training offer for VET tutors and staff, and in some cases, aligned with regional skills strategies¹⁰⁶. In Romania, the University of Bucharest noted that the GIVE modules had become part of their work with in-service teacher training programmes focused on special educational needs¹⁰⁷.

“We appreciated how GIVE focused on real-life implementation. The piloting we did wasn't just theoretical – it involved learners, trainers, and families.”

Project partner (Lantegi Batukak)

The project's digital training platform was also designed with longevity in mind. Developed to support distance learning, particularly for courses relating developing disadvantaged learners, it contains modular training content accessible in multiple languages. Several partners confirmed that the platform remained available after the project's formal end and had been offered to institutional and regional authorities for continued use. This sustainability is further reinforced by the establishment of the GIVE Academy, which continues to offer inclusive training courses—some of which are now being marketed or sold to interested institutions—indicating a shift towards a self-sustaining model beyond EU funding. The platform's continued use and integration into staff development programmes suggest a lasting institutional impact. For instance, stakeholders in Malta and Spain also mentioned efforts to embed the platform into existing institutional workflows, including guidance services and transition support for learners at risk of exclusion.¹⁰⁸

In terms of scalability and policy impacts, the GIVE CoVE produced models for institutional governance that involved multi-stakeholder advisory boards and inclusive coordination mechanisms between training centres, employers, and public actors. These governance models were tested and validated in different national contexts and adapted to both public and private VET providers. While the GIVE project did not directly establish new Centres of Vocational Excellence as permanent entities, it contributed to the strengthening and expansion of inclusive governance structures within existing institutions. In several cases – such as in Finland and Spain – partners reported that the models enhanced local coordination with social services and employment agencies and were being used to inform regional skills planning or institutional development strategies. This suggests that GIVE's impact was primarily embedded within existing VET ecosystems, supporting their evolution toward excellence and inclusion, rather than resulting in the creation of wholly new structures.

¹⁰⁴ ICF interview with MCAST representatives

¹⁰⁵ ICF interviews with GIVE project stakeholders These include representatives from the University of Bucharest (Romania), MCAST (Malta), EFVET (EU-level), Lantegi Batukak (Spain), ENAIP NET / Cometa (Italy), and the project's external expert facilitator (Fondazione Politecnico di Milano, Italy).

¹⁰⁶ ICF interview Project coordinator and EFVET representative

¹⁰⁷ ICF interview with University of Bucharest representative

¹⁰⁸ ICF interviews with GI Group and Lantegi Batukak representatives

The transferability of GIVE's outputs was supported by their alignment with EU-level tools and frameworks. For example, its inclusive governance models and counselling frameworks were mapped against existing EU quality assurance standards (EQAVET) and inclusion priorities under Erasmus+ and the European Pillar of Social Rights. Transnational partners such as EFVET confirmed their intent to promote the GIVE outputs within their broader network, particularly in countries where inclusive excellence in VET is underdeveloped or fragmented¹⁰⁹. Additionally, several interviewees mentioned that the GIVE platform had been presented at European conferences and network meetings, suggesting its broader visibility and uptake potential beyond the original partner group.

15.5. Overall impact and lessons learnt

The GIVE project generated tangible impacts at institutional, practitioner, and network levels, particularly in relation to promoting inclusive approaches in vocational education and training (VET). Interviewees across multiple partner organisations highlighted that the project raised awareness and strengthened institutional capacity for serving disadvantaged learners, particularly those with disabilities, migrant backgrounds, or low qualifications. VET providers reported increased familiarity with inclusive pedagogies and counselling tools, as well as greater confidence among staff to apply these methods in everyday training settings.

The GIVE digital platform continues to be maintained after project completion, with several partners and institutions confirming its ongoing use and integration into regular workflows. A key area of impact was the formal and informal uptake of GIVE's pedagogical models. Several partners (including institutions in Italy, Malta, and Romania) noted that GIVE-supported training modules and guidance models were already being integrated into existing programmes, either as pilot schemes or permanent features of staff training¹¹⁰. The digital learning platform and Community of Practice were also viewed as extending the reach of the project's outputs, enabling cross-country sharing of tools and practices¹¹¹.

"GIVE enabled us to move from talking about values to embedding those values into practical governance mechanisms, training pathways, and teacher development."

Project partner (EfVET)

At the policy and governance level, GIVE contributed to improved coordination among education providers, companies, and social inclusion stakeholders. In countries like Finland and Spain, interviewees indicated that the advisory models and collaborative structures piloted under GIVE had been useful in building cross-sectoral dialogue and aligning inclusive VET strategies with labour market needs¹¹². The project also fostered transnational exchange of good practices through its participation in broader networks, including EfVET and the Erasmus+ CoVE community.

Among the main lessons learned, stakeholders emphasised the importance of sustained partner engagement, long-term institutional commitment, and structured collaboration across education, employment, and inclusion sectors. While the GIVE project successfully demonstrated models of good practice, interviewees also noted that continued funding, national policy alignment, and capacity-building are needed to ensure long-term impact and transferability.

¹⁰⁹ ICF interview with EfVET representative

¹¹⁰ ICF interviews with Project Coordinator, University of Bucharest, and MCAST representatives

¹¹¹ ICF interviews with EfVET representative

¹¹² ICF interviews with Lantegi Batukak representatives

16. H2CoVE – Hydrogen Centres of Vocational Excellence

16.1. About H2CoVE

Background information

- **Project name:** H2CoVE – Hydrogen Centres of Vocational Excellence
- **Duration:** 2024-2028
- **Call year:** 2023
- **Project status:** Ongoing

H2CoVE (Hydrogen Centres of Vocational Excellence) is a project coordinated by the Vestland County Municipality in Norway and focused on developing specialised vocational education and training for the hydrogen sector. The project aims to address the skills gaps that could potentially slow innovation and transition to a hydrogen-based economy.

The project involves 20 partners in five different countries, including Estonia, the Ivano-Frankivsk region in Ukraine, Northern Netherlands, Tyrol in Austria and Vestland in Norway.

Objectives of the CoVE project

The European hydrogen sector faces several major challenges that the H2CoVE project aims to address in the participating regions. These challenges can be summarised as follows:

- **High production costs and limited infrastructure:** The sector struggles with the economic viability of hydrogen production, insufficient refuelling and storage infrastructure, and the need for significant investments to scale up operations, especially in regions like Estonia and Ukraine.
- **Skills and workforce shortages:** There is an acute shortage of qualified engineers, technicians, and specialists with expertise in hydrogen technologies, chemical processes, industrial engineering, and high-voltage electricity. This gap is particularly pronounced in emerging hydrogen regions and across technical domains.
- **Fragmented education and training:** Existing vocational education and training (VET) programmes often do not match the rapidly evolving needs of the hydrogen industry, with discrepancies in accessibility and quality across countries and regions.
- **Slow innovation and knowledge transfer:** The lack of structured collaboration between educational institutions, businesses, and research organizations in some regions hampers the sharing of best practices and slows down innovation in hydrogen skills and technologies.
- **Regional disparities in hydrogen value chain development:** Partner regions have different levels of expertise and infrastructure, leading to uneven progress and missed opportunities for synergy and capacity building across Europe.
- **Need for public awareness and stakeholder engagement:** Low public awareness and limited engagement of citizens, SMEs, and local authorities hinder the acceptance and integration of hydrogen solutions in regional economies.
- **Geopolitical and energy security pressures:** Particularly in Ukraine, geopolitical tensions and the need for energy independence intensify the urgency to develop a resilient and sustainable hydrogen sector.

The H2CoVE project addresses Europe's hydrogen sector challenges by establishing a coordinated network of Centers of Vocational Excellence dedicated to developing an industry-aligned skilled workforce. Through collaborative partnerships between educational institutions, businesses, and regional authorities, H2CoVE aims to develop comprehensive training programmes that bridge the hydrogen skills gaps across various VET levels. The project aims to

implement a sustainable approach targetted at training VET teachers, engaging business stakeholders, upskilling employees, engaging students and the public in competitions and non-formal information sessions, and integrating hydrogen curricula into lifelong learning pathways.

16.2. Activities of H2CoVE and skills developed

Activities covered

Although the H2CoVE project is still in its initial phases, having launched just over a year ago, substantial groundwork has been laid to ensure a strong foundation for future activities. According to our interviews, to date, the project has:

- **Established a functional operational infrastructure in the project**, appointing key roles, creating a project handbook, forming a steering committee with cross-regional representation, and implementing communication channels to facilitate collaboration across the five partner regions (including regular bi-weekly meetings for cross-country exchange).
- **Held a kick-off meeting**, during which partners shared their hydrogen expertise, established work package responsibilities, and aligned on the methodology for conducting the comprehensive skills needs assessment that would underpin all future project activities.
- **Established their needs assessment methodology and shared good practices**. Partners have been particularly impressed by the Netherlands' methodical research approach, which combines analysis of three years of job vacancy data, stakeholder interviews along the hydrogen value chain, and validation workshops with industry representatives, a framework that other regions are now adapting to their local contexts.
- **Prepared a plan to hold impactful ecosystem talks with sectorial stakeholders**. The CoVE project is organising regional ecosystem talks informed by innovative approaches to these talks in the Netherlands, Austria and Norway, bringing together diverse stakeholders to validate research findings, establish connections between educational institutions and hydrogen businesses, and create sustainable regional partnerships that will evolve throughout the project's lifetime. Eventually, the project should engage 800 business stakeholders.

Skills developed

Even though the comprehensive skills needs assessment is still underway and its first formal results will be available only in September 2025, the project partners already have insight into the different types of competences that the hydrogen sector is lacking and that the project will aim to address. Based on our interviews with various project partners, the five critical skill categories for the hydrogen sector to address through H2CoVE are:

- **Safety competences**: Workers need specialised knowledge to handle hydrogen's explosive properties and ammonia's toxicity safely. As an interviewee from Norway emphasised, "safety is number one" when working with these energy carriers, making it an essential foundation before operational activities can begin.
- **Technical maintenance skills**: Workers must develop capabilities to maintain and operate new hydrogen-powered systems, particularly engines and equipment converted from traditional fuels. An interviewee from Norway highlighted this challenge when discussing large combustion engines.
- **Knowledge about production technologies**: Understanding various hydrogen production methods – from electrolysis to steam methane reforming – is crucial, with particular emphasis on sustainable approaches. As an interviewee from Ukraine explained, workers need to understand the distinctions between production technologies, their efficiency, and their environmental impact.

- **Regulatory and policy knowledge:** Workers require understanding of hydrogen-specific regulations, legal frameworks, and business development principles as the sector evolves. An interviewee from the Netherlands noted this was an unexpected finding that emerged from their needs assessment, revealing demand for skills that was not initially obvious.
- **Practical experience:** Hands-on experience with hydrogen infrastructure, systems, and equipment is essential for workforce development in this emerging sector. An interviewee from Ukraine emphasised this when discussing plans to acquire "special laboratory equipment" and "models of hydrogen technology like simple electrolyzer and simple fuel cells" so learners can see how the technology works in reality rather than learning only theoretical knowledge.

According to preliminary findings that could be collected from the project partners in the Netherlands, the following skills were most needed in France, the Netherlands and internationally in the hydrogen sector. According to different EQF levels:

- Production roles (EQF 2-7): Assembly workers, IT/ICT specialists, engineers, procurement staff, HSE specialists;
- Transport and installation (EQF 2-7): Logistics personnel, installers, construction workers, electricians, plumbers;
- Operations and maintenance (EQF 3-7): Maintenance workers, HSE specialists, ICT staff, operations workers, engineers;
- For engineering professionals (EQF 6-7), required competencies include: Hydrogen safety and hazards, hydrogen systems, hydrogen regulations, certification, hydrogen production, hydrogen facilities operations, hydrogen fuel cells, hydrogen storage and transport, hydrogen refueling, knowledge of catalysts and electrolyzers, innovation to improve efficiencies and manufacturing and assembly hydraulics;
- Research and development roles (EQF 6-8): Researchers, engineers, policy workers, IT/ICT specialists, legal & financial workers, HSE specialists.

These results were shared as preliminary findings of a literature review the Dutch partners conducted, which would be one of the sources together with a job boards analysis, a survey sent out to relevant stakeholders and interviews that would feed into the needs assessment. Similar needs assessment activities inspired by the Dutch model should be conducted in each partnering country and should serve as the bases for the development of educational activities.

16.3. Results expected and achieved

Contribution to the development of qualifications

Based on initial findings of the needs assessment activities and company inputs, the consortium is now planning targeted educational interventions. These educational activities can be summarised into the following categories:

- **Training the trainers:** The project aims at training at least 155 teachers. For example, the Norwegian project partners are developing a 3-day electrochemistry course for vocational and high school teachers, combining theory and practical lab work. Their additional plans representing potential for transferability include international train-the-trainer programmes extending to South Africa through additional Erasmus+ mobility funding. In The Netherlands, courses for teachers should include contents related to law and regulations in the hydrogen sector. Austrian partners target teachers at technical schools (HTLs), vocational schools, and training institutions (BFI, WIFI) to develop hydrogen skills across EQF levels 4-5, supporting dual apprenticeships and workforce upskilling initiatives.
- **Upskilling/reskilling the current workforce through short-term courses and training courses:** The project aims at upskilling or reskilling 1,000 employees.

Norwegian partners have previously rolled out the "My Workplace" programme with local vocational schools, focusing on preparing workers for new energy carriers. Companies like the Sustainable Energy Catapult Center are prioritizing workforce development to safely handle hydrogen technologies and help businesses develop technical expertise in this emerging sector. The project should build on this expertise and develop a total of 25113 specific courses to offer to companies and professionals.

- **Innovating or developing new long-term education programmes:** Ukraine is building educational capacity ahead of industry development by integrating hydrogen courses (3-6 ECTS) into existing programmes, aiming to develop long standalone degrees when the hydrogen industry develops. Their first course covers the full hydrogen value chain including generation, storage, infrastructure, safety, and applications. Norwegian partners enhance existing hydrogen specializations through industry partnerships and a new course development council, updating curriculum annually and using wider company input available due to the H2CoVE project. Estonian partners plan to develop experimental hydrogen courses, build demonstration labs for hands-on production experience, and create a microdegree programme to provide practical skills needed for industry transition. Austrian partners are expanding hydrogen modules at universities, developing business-technology case study courses, incorporating hydrogen into Winter School programmes, and working with secondary schools to change chemistry curricula.
- **Engaging students through competitions and the general public through informative sessions:** The CoVE project aims to raise the attractiveness of the sector through competitions aimed at 130 students and engaging 300 members of the public through non-formal information sessions.
- Additionally, the project also aims to **connect industry practice with research** by supporting 12 Project/Bachelor and Master theses.

We are building an Excellence Center for a non-existing industry in Ukraine. That's the truth. This is how it is. But we strongly believe in how we work with the Hydrogen Council of Ukraine, Hydrogen Association of Ukraine, with our other project partners and with the local energy cluster. We hear from them that new pilot projects [in the hydrogen industry] will start next year. And this will immediately trigger the requirement of the need for the new staff trained."

An interviewee in Ukraine explaining their efforts to build educational capacities for the hydrogen sector in advance of industry innovations being implemented

Contribution to enhancing the quality and attractiveness of VET

The hydrogen industry is developing rapidly, though actual implementation timelines remain fluid and dependent on various factors. As an industry partner explained in an interview, companies are positioning themselves to be in the forefront of developing new green ventures, including hydrogen production and ammonia bunkering projects. However, the company partners interviewed also emphasised the contingent nature of implementation: "*The first question is, will hydrogen and ammonia be available on our site? If yes, when?*"

While acknowledging uncertainty about exact timing, they stressed that workforce preparation cannot wait for full technology implementation. Companies need qualified personnel ready when hydrogen systems become operational. This preparation must address diverse technical needs: safety training for handling hydrogen and ammonia (both hazardous in different ways), implementation and maintenance skills, production process knowledge, regulatory expertise, and specialised competencies across the entire value chain. Workers need training at various qualification levels to support roles from production and transport to operations and research,

¹¹³ 25 courses in total, including short-term courses offered to companies and long-term undergraduate and post-graduate courses, which will be decided according to the needs assessment and partners' institutional and regional contexts.

ensuring the industry can deploy new technologies immediately when resources become available.

The H2CoVE project addresses an urgent need to reskill the workforce, enhancing the quality and attractiveness of VET by developing forward-looking education and training that directly responds to industry requirements across the hydrogen value chain, positioning VET institutions as essential partners in the green energy transition and creating pathways for workers to participate in this emerging sector before the technologies are fully implemented. Importantly, regional partners strengthen this approach by developing comprehensive roadmaps that align education sector offerings with local hydrogen industry developments, creating shared visions that can be regularly revisited to maintain relevance. These roadmaps are particularly useful because they serve as a specific framework of reference through which partners can facilitate discussions to improve the alignment of the education sector with the hydrogen industry.

To increase the attractiveness of VET, the H2CoVE project partners are building bridges between education and industry to address the challenge of attracting students to technical programmes (although as one interviewee said: “*VET hydrogen attractiveness is not really an issue, but the VET attractiveness is an issue*”). Multiple strategies enhance these connections: integrating industry professionals as guest lecturers, offering opportunities for students to conduct Bachelor's and Master's theses on hydrogen topics or creating mobility and internship opportunities where students can work directly with companies while completing their academic requirements.

Beyond formal education, partners conduct outreach through career days, school visits, and public demonstrations. A particularly innovative approach involves providing hands-on hydrogen demonstration equipment. For example, one interviewee mentioned developing model cars with electrolyzers and fuel cells that make the technology tangible for high school students. Recognizing that such equipment is often prohibitively expensive for schools, partners are developing regional funding initiatives with hydrogen companies to sponsor equipment for secondary schools, further strengthening industry-education relationships while making hydrogen careers more visible and attractive.

16.4. Success factors

Added value of H2CoVE

The H2CoVE project has been designed in a way to have potential to significantly strengthen the dialogue between educational institutions and industry partners regarding hydrogen training needs. This enhanced communication allows educational providers to develop more targeted courses that directly address specific industry requirements. While industry-education collaboration existed previously, project partners report that H2CoVE has formalised and deepened these relationships, creating structured mechanisms for ongoing input from companies. The project's comprehensive needs assessment methodology has reportedly been particularly valuable in regions where industry stakeholders initially struggled to articulate their specific training requirements, with partners developing guided approaches to help companies identify their hydrogen workforce needs.

A key innovation has been the establishment of formal industry advisory structures, including dedicated course development councils where companies provide systematic feedback on curriculum content. According to our interviews, these councils transform occasional industry input into a sustained commitment, with regular meetings and clear expectations. This formalised structure helps to ensure that educational offerings remain responsive to rapidly evolving industry needs, particularly important in an emerging sector like hydrogen where technologies and applications continue to develop. Interviewees have also expressed that for educational institutions, this provides confidence that their programmes will produce graduates with immediately applicable skills, while industry partners gain influence over training content directly affecting their future workforce.

The transnational dimension of H2CoVE creates added value by connecting regional hydrogen ecosystems across Europe. Partners consistently highlight how this international perspective allows them to learn from experiences in other countries rather than developing solutions in isolation. Norwegian partners specifically mention learning from the more established hydrogen valley in the Netherlands, adopting their stakeholder engagement model for ecosystem development. Similarly, Ukrainian project partners value exposure to hydrogen education approaches from other countries, helping them develop appropriate training despite their hydrogen industry being at an earlier stage of development.

These international exchanges occur through both formal project meetings and ongoing communications, creating what partners describe as a strong network connecting regional, national, and European contexts. The project has facilitated connections not only within H2CoVE but also with other Centres of Vocational Excellence, including those focused on green skills and battery technology, allowing partners to share sustainability-focused approaches and solutions beyond hydrogen alone. Partners from Norway also reported collaboration with international bodies like the UN Industrial Development Organization on fine-tuning their skills assessment methodologies, which they attribute to the international networking opportunities gained through H2CoVE. Despite varying levels of hydrogen industry development across regions, the project creates shared learning opportunities that benefit both established and emerging hydrogen ecosystems, with well-connected regions sharing expertise while gaining fresh perspectives from partners facing different implementation challenges.

Potential for sustainability, scalability and transferability

The project's international dimension enhances transferability through deliberate knowledge exchange between regions at different stages of hydrogen sector development. Partners from rising hydrogen regions learn from established hydrogen valleys in other countries. The knowledge transfer extends beyond Europe, with Norwegian partners conducting continuous education classes for professionals in India and planning trainer development courses at the University of Pretoria in South Africa, both of which exemplify the transferability potential of the H2CoVE activities. The project also ensures hydrogen sector scalability by developing coordinated education programmes that prepare workers' capacities at multiple skill levels before regional hydrogen technologies are fully implemented. Regional partners enhance scalability by developing comprehensive roadmaps that create shared visions for hydrogen sector development, providing frameworks that can be regularly revisited and adapted as local industries evolve.

As a project in its initial stages, H2CoVE has already identified the need for supplementary funding beyond the core EU grant. Partners have established a dedicated work package (WP6) focused on attracting additional resources. They are pursuing diverse funding sources, including Erasmus+ mobility grants for international activities or private sector sponsorships particularly for expensive demonstration equipment.

16.5. Overall impact and lessons learnt

The H2CoVE project has initiated knowledge exchange between partners across different regions, facilitating the adoption of methodological approaches for skills assessment and needs analysis. The international dimension creates additional value by connecting regional hydrogen ecosystems across Europe and beyond. Partners report benefiting from transnational collaboration with both project members and external organizations, including other Centres of Vocational Excellence focused on green skills and entities such as the UN Industrial Development Organization. This broader network enables knowledge transfer that extends beyond the immediate project scope, with Norwegian partners conducting educational activities in countries like India and South Africa. This dimension of international exchange appears particularly relevant for regions at different stages of hydrogen sector development, with emerging hydrogen regions developing educational infrastructure in preparation for anticipated industry growth.

Although the project is still in its initial phases, H2CoVE has developed plans for a range of educational interventions based on preliminary needs assessment findings. These include training programmes for vocational teachers, targeted courses for upskilling and reskilling industry employees, integration of hydrogen content into existing educational frameworks, engagement activities to attract students and inform the public about hydrogen careers, and initiatives connecting industry with academia through student research projects. In particular, partners have developed comprehensive value chain mapping approaches that identify educational requirements for each stage of hydrogen development, ensuring systematic coverage of workforce preparation needs.

Key lessons observed include the potential benefits of structured company-education partnerships through mechanisms such as industry advisory councils, which may help systematise input from industry stakeholders. Companies participate in curriculum development relevant to their future workforce needs, while educational institutions can better align their programmes with industry requirements. The incorporation of industry professionals into teaching activities and the creation of research opportunities for students with companies appears to establish connections between education and industry while potentially increasing visibility of hydrogen-related career pathways for students.

17. HABITABLE – Alliance of Centres of Excellence in Vocational Training for a Sustainable Habitat

17.1. About HABITABLE

Background information

- **Project name:** HABITABLE - Alliance of Centres of Excellence in Vocational Training for a Sustainable Habitat
- **Duration:** 2023-2027
- **Call year:** 2022
- **Project status:** Ongoing

HABITABLE is a project led and coordinated by AEICE in Spain—an Efficient Habitat Cluster that brings together companies, research centres, universities, and other organisations in the habitat sector. The habitat sector encompasses a wide range of professional occupations, including infrastructure construction, housing and building installations, wood and furniture manufacturing, home textiles, and electrical and lighting systems. Recognised by the Ministry of Industry, Trade and Tourism as an “Excellent Cluster”, AEICE consolidates its position as a key reference in the field. Through innovation and collaborative initiatives, the cluster works to enhance the sector’s competitiveness and foster the socio-economic development of the region.

As part of the broader Centres of Vocational Excellence (CoVE) initiative, HABITABLE builds on AEICE’s leadership in fostering innovation and collaboration across the habitat sector. The project brings together 17 partners from six countries – Austria, Georgia, Greece, Moldova, Spain, and Portugal – including universities, VET centres, a regional government, SMEs, clusters, and organisations representing industry and sector interests. The largest share of partners is from Spain (7), followed by Portugal (3).

Objectives of the CoVE project

The HABITABLE project addresses the skills gaps and mismatches in the habitat sector, particularly those driven by the green and digital transitions. This project aims to strengthen the capacity of vocational education and training (VET) systems to respond to evolving labour market needs, while placing inclusion and equity at the heart of education and training efforts.

At its core, the project is centred on the co-creation of a transnational Platform of Centres of Vocational Excellence (CoVEs) for Sustainable Habitat. This platform brings together a wide network of local and regional stakeholders to build a dynamic skills ecosystem and foster international cooperation through strategic partnerships with CoVEs across countries.

To achieve this vision, partners are pursuing a set of overarching objectives that guide their collective efforts:

- Lead the green and digital transition of the Habitat sector by developing a transnational cooperation platform of CoVEs and a Skills Strategy, aligned with the SDGs.
- Implement Skills Intelligence for the habitat sector
- Boost quality, digital, green and inclusive dual VET, work-based learning (WBL) and apprenticeship
- Support the creation of business-education cooperation partnerships
- Provide labour market relevant skills including those necessary for the green and digital transitions
- Design innovative learner-centred teaching methods supported by digital tools and Extended Reality (XR) technologies

- Provide access to innovative curricula that focus both on technical skills and key competences
- Support upskilling and reskilling of adult learners and SME employees for the green and digital transition
- Implement a system for certification of microcredentials
- Support career guidance and promote social inclusion, and equity in education
- Foster transnational mobility for VET educators and learners
- Create new spaces for international cooperation and innovation
- Provide policy recommendations to implement regional and local strategies to raise upward convergence of CoVEs.
- Maximise the impact of the project, further use of its products and mainstreaming of its results.

According to the project coordinators, a key ambition is to establish a lasting alliance between vocational training centres and the Habitat industry – an alliance that endures beyond the project's duration. This partnership seeks to improve alignment between the education and business sectors and strengthen collaboration on skills development. The alliance has already taken shape at the regional level, with plans to expand its reach nationally and internationally.

One of the main challenges identified is the difference in language, processes, and working cultures between businesses and VET providers. These differences can hinder communication and cooperation. To overcome this, the project also aims to develop a shared language and common framework that facilitates mutual understanding and effective collaboration across sectors.

In essence, HABITABLE reimagines skills development as a collaborative, data-informed, and technology-enhanced journey – one that empowers individuals and institutions alike to shape a more sustainable and resilient habitat sector across Europe.

17.2. Activities of HABITABLE and skills developed

Activities covered

As the deep transformation of the habitat sector requires continuous training, upskilling, and reskilling of professionals and VET learners, there is a growing need to connect VET with innovation and skills ecosystems, adopt learner-centred approaches supported by digital technologies, and foster sustainable business-education cooperation. HABITABLE aims to provide a comprehensive set of innovative resources, reference materials, and digital tools, organised across the following functional areas:

- **SMART SIP: enhancing skills intelligence**

The SMART Skills Intelligence Platform (SMART SIP) will serve as a digital ecosystem for mapping, analysing, and monitoring jobs, skills, and training offers within the habitat sector. It will include tools such as **SMART Info**, an online resource designed to assist professionals in the habitat sector by delivering timely and relevant information, resources, and guidance on key European instruments that enable the application of skills intelligence within the sector; the **Sector Map of Jobs and Skills**, a digital tool that offers a reference framework for the habitat sector's occupational landscape, mapping jobs within their professional context and linking them to relevant VET programmes; and the **Training Offer Panel**, an online digital monitoring panel providing up-to-date information on initial and continuing VET programmes and courses available within the VET skills ecosystems involved in the project. These tools will support policymakers, training providers, and employment services by facilitating a better match between training provision and labour market needs, particularly in relation to the green and digital transitions.

- **DUAL Online Centre: Fostering work-based learning**

The DUAL Online Centre will provide a digital space to promote dual education and work-based learning models. It will feature a cooperation space to share good practices and foster collaboration among Centres of Vocational Excellence, VET providers, and companies. The platform will offer a **CoVEs Online Collaborative Space**, a digital platform that fosters collaboration between SMEs and VET centres to build partnerships and develop a Community of Practice in Work-Based Learning excellence; **WBL for ALL Space**, a resource hub promoting social inclusion, diversity, and equity by providing good practices and guidelines for inclusive apprenticeships in the habitat sector; and **SMEs Quality Apprenticeships Supporting Programme** offering tailored training and tools to help SMEs design apprenticeships aligned with the Sustainable Development Goals (SDGs) and the green and digital transitions.

- **SKILLS HUB: Centralising access to training**

The SKILLS HUB will function as a multifunctional digital platform that supports the implementation of the Habitat sector skills strategy by offering targeted training, certification, and career guidance. The digital tools available in this multifunctional online platform are an **Online Training Platform**, offering tailored training programmes and MOOCs for VET teachers, SMEs, and learners to develop skills aligned with green, digital, and inclusive transitions; an **Innovative Curricula Digital Database**, providing VET teachers and trainers with access to updated curricula and teaching practices for emerging skills and occupations in the habitat sector; a **Micro-credentials Certification Centre**, a web-based tool that enables the validation and certification of short-term and prior learning through micro-credentials, supporting career development and lifelong learning and a **Career Guidance Space**, an AI-based guidance tool offering personalised career advice and training suggestions, alongside a handbook to support inclusive guidance services in the habitat sector.

- **HABITAT Skills Ecosystems: Co-creating the HABITAT Skills ecosystem**

The HABITAT Skills Ecosystems is a transnational cooperation platform of Centres of Vocational Excellence (CoVEs) and the development of a sector-wide Skills Strategy aligned with the Sustainable Development Goals (SDGs). To this end, the project has established a collaborative structure to co-create the Habitat Skills Ecosystem, supported by four key instruments: **Platform of CoVEs for Sustainable Habitat**, a transnational platform of CoVEs that works jointly on defining a skills strategy for the sector and developing policy recommendations to foster regional and local implementation; **Skills Ecosystem Innovation Tank**, a collaborative workspace that brings together VET providers, SMEs, and innovation hubs to co-design and test projects that address sectoral challenges and promote social inclusion through WBL and dual training; **Co-creation LAB of new projects**, an online space to generate and prepare collaborative projects within the Habitat skills ecosystem, fostering innovation, applied research, infrastructure development, and partnership-building; and the **CoVE Ambassadors Mobility Programme**, an international exchange programme that promotes the transfer of innovation and good practices among VET learners and teachers within the CoVE network through short-term mobilities.

Progress after two years of implementation

The project is currently at its midpoint, having completed two of its four planned years. Several key components are already underway. The alliance between VET centres and the habitat industry has started to materialise at the regional level through the establishment of the Habitat Regional Alliance of Castilla y León, formally signed in April 2025 by AEICE, EDUCACyL, INFODEF, the Instituto de la Construcción de Castilla y León (ICCL), Fundación Laboral de la Construcción, and CESEFOR. Building on this foundation, the Alliance will now facilitate the involvement of business associations, companies, and institutions from other Autonomous Communities across Spain, while parallel efforts aim to extend the partnership internationally. Austria hosted the 3rd Transnational Partners Meeting in February 2025 in Kuchl, Salzburg. The

event focused on reviewing project progress and showcasing Austria's excellence in vocational education and training (VET), particularly in timber construction. Partners visited FH Salzburg, HTL Kuchl, and HTL Hallein to explore dual education models and innovative training facilities. They also visited BinderHolz and WIFI Salzburg to observe industrial innovation and continuing education practices. Portugal hosted the 2nd Transnational Partners Meeting and a Multiplier Event in May 2024 in Aveiro. Organised by Cluster Habitat Sustentável and CTCV, the event focused on promoting green and digital skills in the Habitat sector. It featured expert panels, institutional presentations, and discussions on circular economy and skills development. Portugal is also actively involved in the development of the HABITABLE Skills Hub. Greece, Moldova, and Georgia are part of the teaching and learning cluster of the HABITABLE project. Institutions such as the University of Thessaly in Greece, the vocational training institute in Moldova, and Construct 2 in Georgia are listed among the educational partners contributing to the project's pedagogical development.

To address the challenge of differing languages, processes, and working cultures between the education and business sectors, the consortium has launched a research activity focused on developing an open methodology to translate NACE (Statistical classification of economic activities in the European Community)¹¹⁴ codes into ESCO (European Skills, Competences, Qualifications and Occupations)¹¹⁵ codes. This initiative is intended to create a shared language and support better alignment between labour market needs and training provision. So far, the research has led to the identification of 140 relevant skills in the sector. Moreover, another research activity in the HABITABLE project is the integration of a competency table developed through a previous initiative led by the University of Salzburg and Timber Construction Europe. This table, the result of multi-country collaboration, details the skills, knowledge, and competencies required at different levels in timber construction. Its aim is to standardise qualifications across regions, facilitating professional mobility and ensuring consistent recognition of competences. HABITABLE will build on this work to support a common understanding of vocational profiles and aiming to enhance the quality and comparability of training across countries. .

In parallel, innovative technologies are being piloted, including blockchain for the accreditation of learning outcomes and AR/VR for training delivery and quality assurance by providing visual guidance during construction training, which helps workers, especially those with limited experience or language barriers, understand exactly where and how components should be placed. These tools are expected to enhance training effectiveness and support curriculum innovation.

Curriculum development is ongoing for both learners and professionals, supported by a feedback mechanism involving the project's 17 partners. Initial training sessions have been organised, and the first iterations of the updated programmes are being tested. Work has also begun on exploring microcredentials as a flexible tool to recognise skills acquisition in response to evolving labour market demands.

Skills developed

The project coordinators underscored the importance of recognising the habitat sector as broader and more strategic than traditional construction alone. This understanding has directly informed the project's approach to skills development. The Habitable initiative builds on this vision by fostering a comprehensive set of competences that respond to the sector's evolving demands – including job-specific skills, green and digital capabilities, transversal competences, and flexible learning pathways through micro-credentials.

¹¹⁴ NACE is a four-digit classification system used as a framework for collecting and presenting statistical data on economic activities across a broad range of European statistics, including those in the economic, social, environmental, and agricultural fields.

¹¹⁵ ESCO is the multilingual classification system for European Skills, Competences, Qualifications, and Occupations. It defines and organises these elements to reflect the needs of the European labour market, as well as education and training systems.

Transversal skills

The project promotes key transversal competences including adaptability, collaboration, and communication. Interviewees noted that fostering mutual understanding between the education and business sectors has been essential—especially by addressing differences in language and working culture. This is operationalised through the development of a shared vocabulary between sectors, such as linking NACE codes and ESCO competences, which facilitates clearer communication and co-design of training pathways. Moreover, transversal skills are embedded in the project's digital tools and learning platforms, which are designed to support inclusive, learner-centred approaches that reflect the diversity of cultural, social, and professional contexts across participating countries.

Job-specific skills

The project supports the acquisition of specialised skills tailored to the habitat sector. These include timber and lightweight construction, green engineering, and competences related to the full lifecycle of the built environment – from raw material extraction to demolition.

Green and digital skills

Sustainability and digital innovation are central to the project. Interviewees reported efforts to foster green competences such as circularity, reuse, and sustainable construction practices, particularly in timber and lightweight construction. These are supported by training on material impact, life-cycle extension, and the application of circular economy principles – competences aligned with GreenComp areas such as “acting for sustainability” and “envisioning sustainable futures”. On the digital side, the project integrates advanced tools like AI, AR/VR, and blockchain to support training delivery, quality assurance, and the secure accreditation of learning outcomes. For example, AR is used to assist untrained workers in understanding construction processes, while blockchain is being explored for micro-credential certification. These initiatives foster DigComp 2.2 competences such as interacting through digital technologies, evaluating digital content, and solving technical problems in digital environments. The project also promotes the development of MOOCs and digital platforms like the Skills Hub to deliver accessible, modular learning aligned with labour market needs. Altogether, these efforts reflect a strong alignment with EU frameworks such as DigComp and GreenComp, aiming to modernise the skillset of VET learners and professionals.

STEM and innovation skills

The project also promotes STEM and innovation-oriented skills through its emphasis on material science, lightweight construction, and digital engineering. Learners engage with applied technologies such as AR/VR to visualise construction processes and improve quality assurance, particularly in timber construction. The development of MOOCs, micro-credentials, and a digital Skills Hub further supports flexible, modular learning. These efforts are designed not only for learners but also for trainers, ensuring that teaching practices evolve alongside technological and environmental demands.

Microcredentials and flexible learning

Interviewees highlighted the development of modular, flexible learning paths designed to support upskilling and continuous professional development. Microcredentials are being designed to allow for cross-border recognition of specific competences. Digital platforms – such as the SKILLS HUB and the DUAL Online Centre – will facilitate personalised learning pathways based on user profiles and sectoral needs. A pilot phase involving learners and trainers from six countries is planned to test the training ecosystem in real-world conditions in 2027.

Moreover, the project's emphasis on microcredentials introduces a flexible, modular approach to learning. These credentials allow learners to build and validate specific skill sets aligned with labour market needs, while also enabling cross-border recognition. The upcoming pilot phase in 2027, involving learners and trainers from six countries, will test the full training ecosystem in real-world conditions – offering a scalable model for vocational excellence that is both innovative and inclusive.

17.3. Results expected and achieved

Contribution to the development of qualifications

Competency mapping and standardisation: One of the most significant contributions is the identification and translation of NACE codes into ESCO competences. This mapping exercise supports the creation of a shared language between education and industry, enabling the development of qualifications that are aligned with real labour market needs.

Curriculum development across EQF levels: The project is developing curricula that span from lower to higher EQF levels (e.g., from level 3 to 6 or 7), tailored to apprentices, professionals, and lifelong learners. These curricula are being designed with flexibility in mind, allowing for adaptation to different national contexts and learner profiles.

Train-the-trainer programmes: A training programme for 20–30 Spanish trainers is being prepared in Austria to support the rollout of new curricula and ensure quality delivery. This initiative contributes to the professionalisation of VET educators and the standardisation of teaching practices.

Contribution to enhancing the quality and attractiveness of VET

Digital platforms for personalised learning: The project has developed several digital tools – SMART SIP, DUAL Online Centre, and SKILLS HUB – that centralise access to training, facilitate work-based learning, and align training content with current labour market needs. These platforms enhance the accessibility, flexibility, and relevance of VET offerings.

Integration of emerging technologies: AR/VR, and blockchain are being piloted to modernise training delivery and accreditation. These technologies improve learner engagement, support quality assurance, and make training more inclusive – especially for learners with diverse backgrounds.

University-VET collaboration: HABITABLE promotes best practices such as co-locating VET centres on university campuses, as seen in Austria. This integration enhances the prestige of VET, facilitates resource sharing, and encourages smoother transitions between vocational education and training and higher education.

Feedback loops and continuous improvement: The project uses feedback from its 17 partners to iteratively improve curricula and training tools. This ensures that VET programmes remain aligned with evolving industry needs and pedagogical standards.

17.4. Success factors

Added value of HABITABLE

HABITABLE adds value by fostering a collaborative, cross-sectoral approach to skills development in the habitat sector. It brings together VET providers, companies, universities, and public authorities to co-create training content, digital tools, and methodologies that are aligned with labour market needs and the twin green and digital transitions. The project promotes a shared understanding between education and industry, helping to reduce fragmentation and improve the responsiveness of training systems.

By embedding innovation, inclusion, and sustainability into its core, HABITABLE actively modernises VET through a hands-on, demand-driven approach. The project fosters learner-centred and flexible learning pathways, underpinned by competence-based frameworks that are responsive to real labour market needs. Drawing on strong collaboration between education providers and industry, HABITABLE ensures that curricula are not only aligned with green and digital transitions but also adaptable across cultural and professional contexts. It also reinforces the strategic relevance of the habitat sector by positioning it as a key driver of sustainable development, circularity, and regional resilience – particularly through initiatives like micro-

credentials, augmented reality in training, and the creation of a transnational alliance bridging education and enterprise.

Potential for sustainability, scalability and transferability

The project's structure and outputs are designed to be transferable across different national and institutional contexts. Its digital platforms, such as the Skills Hub, SMART SIP, and DUAL Online Centre, offer modular, open-access tools that can be adapted to local needs while supporting cross-border collaboration. These platforms facilitate the exchange of curricula, training methodologies, and good practices, enabling institutions to learn from one another and replicate successful models.

HABITABLE also promotes structured peer learning through its CoVEs Online Collaborative Space and Incubator of Business–Education Partnerships. These mechanisms support the scaling of effective cooperation models and the alignment of training provision with sectoral demands. As the project progresses, the release of resources such as the Bank of Good Practices and policy recommendations will further support its uptake and institutionalisation across Europe.

17.5. Overall impact and lessons learnt

At its current stage, HABITABLE has already made a meaningful contribution to strengthening VET systems in the habitat sector. The project has advanced the alignment of training provision with labour market needs by fostering collaboration between VET providers, companies, universities, and public authorities. As AEICE explained during the interview, this alignment is being operationalised through the creation of regional alliances that bring together training centres and companies to establish a common language and shared objectives. Through the co-creation of curricula, digital tools, and shared competence frameworks, it has supported the development of more flexible, inclusive, and future-oriented learning pathways. This is evident in the work of the project partner FH Salzburg, who described during the interview how their university is developing modular curricula for professionals that integrate industry needs and allow for micro-credentialing.

The project has also helped to build a more integrated skills ecosystem by promoting mutual understanding between education and industry actors. This has been achieved through structured cooperation, the development of a common language, and the use of digital platforms that facilitate knowledge exchange and joint innovation. The emphasis on modularity, micro-credentials, and learner-centred approaches reflects a broader shift towards more adaptable and personalised VET provision.

A key lesson emerging from the project is the importance of sustained dialogue and co-creation across sectors and countries. The use of collaborative spaces, feedback loops, and peer learning mechanisms has proven effective in supporting continuous improvement and ensuring that training remains relevant in a rapidly evolving sector. This was echoed by AEICE, who emphasised that the alliance model is designed to be scalable from regional to national and international levels, ensuring long-term sustainability and responsiveness. The project has also highlighted the value of embedding inclusion and sustainability as core principles in VET reform.

18. INVESTech – Innovation Vocational Excellence and Sustainability in Tech

18.1. About INVESTech

Background information

- **Project name:** INVESTech - Innovation Vocational Excellence and Sustainability in Tech
- **Duration:** 2024-2028
- **Call year:** 2023
- **Project status:** Ongoing

INVESTech is a transnational cooperation platform of Centres of Vocational Excellence (CoVEs) focusing on Information and Communication Technology (ICT) across five European countries: Slovakia, Greece, Bulgaria, Cyprus, and Lithuania.

The project aims to establish CoVEs in five European regions (Košice in Slovakia, Attica in Greece, Sofia in Bulgaria, Nicosia in Cyprus, and Klaipėda in Lithuania) by implementing the Quintuple Innovation Helix (Q2IH) Framework, which aims to promote partnerships among academic institutions, industry, public sector, civil society, and the natural environment.

Objectives of the CoVE project

The Information and Communication Technology (ICT) sector across Europe faces several significant challenges that necessitate the development of a skilled workforce. These challenges include:

- **A fast-paced technological evolution:** The ICT industry's constant evolution creates ongoing demand for new skills development. Technologies like AI and quantum computing transform the sector.
- **Changing industry demands and skills mismatch:** The fourth/fifth Industrial Revolutions are reshaping job requirements, with employers seeking both technical expertise and soft skills like communication. Poor coordination between education providers, businesses, and public institutions prevents training programmes from aligning with evolving industry needs.
- **Green transition requirements:** European ICT increasingly needs specialists in energy-efficient computing and carbon footprint reduction. Implementing sustainable practices requires specialised training absent from traditional curricula.
- **Addressing brain drain and inclusivity:** Regions like Eastern Slovakia face ICT brain drain as professionals seek opportunities elsewhere. Simultaneously, women remain underrepresented in these regional ICT sectors, leaving significant workforce potential untapped.

The INVESTech project aims to tackle these challenges in the ICT sector by establishing Centres of Vocational Excellence (CoVEs) in five European regions. In doing so, each CoVE aims to tackle these challenges with the following specific objectives for each region.

- In Slovakia's Košice, the key ICT challenge is the lack of integration and collaboration between different actors in the sector, resulting in insufficient alignment with regional and national innovation strategies despite the sector's significant growth in jobs.
- In Greece, the potential of the ICT sector remains underutilised with ICT holding the lowest share of ICT sector value added in GDP in Europe, amounting to only 3.2% of the country's GDP.
- In Bulgaria, ICT is underrepresented in VET education and a large portion of educational provision has been supplemented by private providers and is delivered

informally. Participation of adult learners also remains low. Cyprus faces a shortage of IT talent despite market growth, with limited skilled professionals and few upskilling opportunities for existing employees.

- In Lithuania, the main ICT sector challenge is related to skills mismatches, where despite having high tertiary education rates, many people work in jobs below their qualification level or unrelated to their field of study. Participation rates in IT-related study programmes also remain low.

The INVESTech project implements targeted activities to address these issues. By connecting education directly with industry needs and building sustainable regional ecosystems, the INVESTech project aims to tackle skills mismatches in the ICT sector, particularly in advanced technology areas like AI, blockchain, big data, and IoT (Internet of Things). To date, the project has made progress through organizing tailored stakeholder workshops and conducting a comprehensive skills gaps assessment. The project's focus on developing flexible microcredentials across three education levels (EQF 4-6) addresses the sector's need for continuous professional development in both technical skills and transversal competencies.

18.2. Activities of INVESTech and skills developed

In the project's initial phase, ASTRA (Slovakia) and partners conducted a comprehensive skills gaps mapping exercise to ensure that project activities meaningfully address the project objectives. The needs assessment has been the project's primary focus to date. With the assessment report published in late April 2025, partners are now preparing next steps to tailor activities based on the findings.

A comprehensive needs assessment and developing microcredentials

The needs assessment exercise took place in all five countries and was conducted through a combination of desk research, focus groups and interviews. The aim of the research was to identify both technical skills gaps in the ICT sector as well as the sector's needs in equipping professionals with more comprehensive and transversal skills. The research was organised around the following sectors (Advanced Technology Industries – ATIs) that heavily rely on cutting-edge scientific research, development, and production processes:

- Advanced Technology Industries
- Artificial Intelligence and Ethics
- Big Data
- Blockchain
- Internet of Things
- ICT for sustainability
- Industry 5.0
- Quantum Computing

The needs assessment identified key skills gaps, emerging roles, and recommendations to align workforce with market demands. While focusing on five countries, partners also examined EU-level needs, finding the EU must boost AI research talent to compete with the US and China. In quantum computing, challenges exist in both workforce development and hardware access. For blockchain, workers lack expertise in industrial applications, necessitating stronger industry-education partnerships. According to the needs assessment, employers struggle to find professionals with both deep technical expertise and the interdisciplinary knowledge needed for implementing cutting-edge technologies.

According to our interview with one of the partners, the methodical approach in the needs assessment revealed consistent findings across all countries. Importantly, beyond the expected technical skills like advanced programming, coding, and data analysis, employers emphasised a critical need for transversal skills and soft skills. The research highlighted that even highly

technical roles require professionals who can communicate effectively with clients and stakeholders from different sectors, speaking their "language" rather than just technical jargon. Based on our interviews, these findings were reported to have been taken into account when designing learning activities in each country.

To link these findings to the current activities that the project partners are developing, and to their further plans, it is important to note here that interviewees have underlined the necessity to develop short-term courses or modules rather than long-term qualification programmes. This is because the ICT sector evolves fast and needs flexible upskilling opportunities. In this regard, long-term qualifications are way too constrained by rigorous accreditation processes that must take place before rolling out a study programme. The project representatives also mentioned in interviews that the ICT sector's highly dynamic nature means that recent graduates quickly find their skills outdated, necessitating continuous professional development opportunities. For these reasons, project partners have decided to focus their attention on developing microcredentials and e-learning courses that serve the needs of the industry better, as they can be adapted quickly to the fast-evolving ICT landscape.

Based on the final needs assessment report, the following table maps the skills gaps that should be addressed through microcredentials:

ATI Area	Identified critical skills
AI & Ethics	Machine learning, AI with ethical considerations, Big data infrastructure, Cryptography, Computer vision, Human-machine interface, 5G technology, Blockchain terminology
Big data	Data analysis, Data visualisation, Cloud computing, Data architecture, Blockchain technology, Big data processing, ICT platform management, Blockchain technology / Smart contracts, Data science, Geographic information systems (GIS), Cloud computing architecture, Neural networks
Blockchain	Blockchain technology (decentralised applications), Blockchain technology (multi-chain focus), ICT system integration, Computer vision, Blockchain technology / Smart contracts, Human-robot collaboration
Internet of things	Internet of Things / Network protocols, Internet of Things / Smart systems, Cybersecurity, Programming, Robotics programming, Fault tolerance in computing systems
Industry 5.0	Embedded systems programming, Digital twin, Autonomous systems, Edge computing, Data privacy, Principles of artificial intelligence
Quantum computing	Quantum computing (error correction), Quantum computing (programming), Artificial intelligence
ICT for sustainability	Big data processing

Source: *INVESTech Report on the identified skill gaps in advanced technologies in industry* (pp. 54-56), available at: [Deliverables - INVESTech](#)

At this stage in the project, the project partners are developing activities to offer to their target groups. The project partners structured their educational offerings across three different levels:

- basic (EQF level 4, secondary education);
- intermediate (EQF levels 5 and 6, higher education); and
- advanced (upskilling of working professionals).

The project partners aim to develop three microcredentials for each ATI area, with each microcredential tailored to the above-mentioned levels. This would result in a minimum of 18 to 21 microcredentials¹¹⁶.

¹¹⁶ Some partners mentioned a minimum of 18 microcredentials, while others mentioned three microcredentials per ATI area, which would result in 21 microcredentials.

Accrediting microcredentials

While microcredentials offer a flexible format of education fitting the needs of the ICT sector, they are also an opportunity to formalise educational provision in the sector, improving the cooperation between companies and universities and making education and training accessible to wider audiences. Interviewees from the project reported high demand for short-format courses from both individual industry professionals as well as companies. At the same time, they frequently expressed uncertainties concerning accreditations of microcredentials due to the novelty of the policy area on the level of the EU as well as in national systems.

Ongoing discussions in the project team concerned who should be accrediting microcredentials, as well as how to apply the principles of credit allocation and accumulation of the European Credit Transfer System to microcredentials on EQF levels 5 and 6. Similarly, the project partners were not sure whether and how to apply the European Credit system for Vocational Education and Training (ECVET) to microcredentials on EQF level 4, because in some countries, the system was “*not very highly adopted*” (as reported by an interviewee from Cyprus). In Greece, one interviewee reported that while a law was recently passed to allow vocational institutions to issue micro-credentials, it is not applied in practice.

“A big discussion is being held now on the micro-credentials and how these are going to be certified. Which public authorities should certify them? Because currently there's none responsible for the micro credential accreditations.”

Project partner in Greece

For these reasons, the project partners were considering using the European Digital Credentials platform linked with Europass where organizations can register as education providers. Other areas of uncertainty pertained to whether companies could accredit courses independently and apply the frameworks of microcredentials to courses they are already offering to their own employees, or if they have to do it in cooperation with universities. The project partners had set up an international meeting for later in 2025 to discuss these issues.

Despite these uncertainties, some interviewees from higher education institutions expressed significant interest in the “stackability” of microcredentials and showed commitment to making the accreditation processes for microcredentials work. Two interviewees from Cyprus outlined a vision for their university to become a microcredential-based hub for reskilling and upskilling in the ICT sector. Through microcredentials, they intended to attract more people to the sector from secondary schools as well as to attract women into ICT professions.

At the same time, it should be noted that the possibilities of the project partners to fulfill their visions in regards to microcredentials were reported as limited by the recognition frameworks in the five different countries. In one of the countries, an interviewee expressed that despite her engagement in different regional and national education policy committees, she had essentially no influence on the development of recognition policies in relation to microcredentials. Despite working for a large public institution, she explicitly stated that the project had no interest in engaging with the government more closely due to the rigidity of the environment. In this regard, however, the interviewees’ positions on the issue differed.

Activities planned beyond microcredentials

As we report above, the focal point in the project indeed seemed to revolve around the development and provision of microcredentials. Due to the early stages of the project, the development of further activities still seemed to require discussions between project partners and guidance from the project lead. Nonetheless, through the interviews we were able to identify plans for the following activities which should stem from the contents developed in the microcredentials:

- Creation of publicly accessible training materials and online courses focused on technical skills and transferable skills;

- Organisation of hackathons and bootcamps linked to newly developed microcredentials and online courses;
- Transnational summer schools highlighting entrepreneurial opportunities for women in the ICT sector;
- Teacher training programmes on entrepreneurial and innovation skills in ICT, including:
 - capacity building initiatives for VET staff on sustainability;
 - strategies for engaging school communities in green transitions;
 - development of a comprehensive handbook for green transition.
- Facilitation of European skills competitions for schools;
- Knowledge mapping and documentation (e. g. creating comprehensive databases of ICT sector entities in each partner country);
- Development of a diversity and inclusion handbook divided into four key areas (project management, events, communication, and project outputs) for the purposes of increasing inclusiveness of the project activities.

Additionally, the project leader referred us to the project application which features the following work packages and activities:

- WP2: Creation of Centres of Vocational Excellence (CoVEs) in partner countries
 - Establishing stakeholder engagement through national workshops
 - Framing CoVEs in partner countries
 - Formalising national CoVEs
 - Building strategies for further development of CoVEs
- WP3: Development of a sustainable platform for international collaboration
 - Creating a strategic development plan for the INVESTech CoVE platform
 - Developing the INVESTech international portal for collaboration
 - Creating synergies with other established CoVEs
 - Joining EU-wide networks and initiatives
 - Organising transnational exchange experiences (study visits)
 - Promoting European collaboration through CO.FUN Labs (Collaboration and Funding Labs)
- WP4: Enhancing Labour Market-Relevant Skills
 - Identifying skill gaps in Advanced Technologies
 - Developing online courses based on the microcredentials
 - Pilot testing of online courses
 - Participation in European skills competitions (Eurosills)
 - Organisation of bootcamps (intensive training programmes)
- WP5: Greening VET
 - Promoting green transition of VET organisations
 - Capacity building of VET staff on sustainability
 - Engaging school communities in green transition
 - Developing a handbook for green transition
 - Implementing action plans for green transition
- WP6: Promoting Innovation and Entrepreneurship in VET
 - Development of innovation labs (i-labs)
 - Creation of entrepreneurial academies
 - Development of entrepreneurial courses
 - Organisation of hackathons
 - Organisation of pitching days events

- Capacity building of VET staff in entrepreneurship and innovation
 - Summer schools promoting entrepreneurship of women in ICT
- WP7: Quality Assurance and Evaluation
 - Developing quality assurance and evaluation plan
 - Peer review of project deliverables
 - Impact evaluation on green transition
 - Feasibility and impact study on microcredentials in VET
 - Impact evaluation on innovation
 - Social impact assessment
 - Self-assessment of national CoVEs
- WP8: Dissemination, Exploitation and Sustainability
 - Development of project branding and promotional materials
 - Creating project website
 - Social media campaigns
 - Publishing articles and presentations
 - Distribution of newsletters
 - Organising events for engaging the educational community
 - Organising transnational conferences

Developing partnerships

Apart from the needs assessment exercise, activities that have taken place to date have been focused on engaging different stakeholders in the project. According to our interviewees, the efforts to expand the partnerships and networks have mainly taken place through several workshops organised in each country where each partner operated individually. These so-called 'national workshops' included sessions on different topics covered by the project, such as greening VET institutions, promoting innovation and skills development in ICT.

According to the project application, the national workshops should have served as the first contact point to draw different stakeholders into the project. It should be followed up by action to formalise these partnerships through signing a Cooperation Agreement. As the project partners write in their application:

"Partners are also going to invite associate partners and external stakeholders to participate in the CoVEs by signing the agreement or a letter of intent." (INVESTech project application, p. 66)

From the interviews we have conducted, it was clear that project partners made efforts to engage different stakeholders in the project by inviting them to these workshops and introducing the project to them. The strategy that was being followed, however, was not fully clear. The project lead from Slovakia referred to a comprehensive framework for promoting diverse partnerships called the Quintuple Innovation Helix (Q2IH) Framework. When asked about developing partnerships, however, interviewees from partnering countries did not refer to how innovations from this framework were being used in their efforts.

Nonetheless, project partners have been experimenting with offering stakeholders different benefits to attract their interest in the CoVEs. According to our interviewees, schools have been responsive to the offer of skills competitions (although in Greece, participation in European skills competitions reportedly faced institutional barriers). In some cases, the project partners have been engaging governmental organizations. This has mainly taken place through the above-mentioned workshops. In Greece, the Ministry of Education delegated two people to observe the project and identify any opportunities for follow-up cooperation. In Cyprus, a representative from the local quality assurance agency (responsible for higher education accreditations) attended one of the workshops on microcredentials.

When it came to engaging companies, interviewees have found this task more difficult and had to mobilise their personal networks more substantially. In cases where they secured interest from companies, they offered them a very specific way to engage in the project. For example, in Cyprus, companies were interested in piloting microcredentials.

In Slovakia, high-tech companies were interested in the sustainability aspect of the project because they wanted to access know how related to the reduction of environmental emissions. The Slovakian CoVE also reported collaboration with the Kosice IT Valley. Kosice IT Valley created a comprehensive database mapping IT sector entities in Eastern Slovakia which reportedly helps the Slovak CoVE to identify partners for collaboration in the region.

The transnational nature of the project also became attractive to some companies when the project partners highlighted that the training available through the project could help companies meet specific training needs that aren't typically available locally. In some cases, interestingly, companies were more willing to cooperate with secondary schools rather than with universities as they perceived schools to be more flexible and receptive of industry inputs.

In cases where engaging companies was difficult, interviewees mentioned that either companies were not used to contributing to the development of vocational education beyond specific apprenticeship arrangements (namely in Greece) or were not yet offered a role in the project that would be tangible enough for them to commit to. Successful engagement required extensive persuasion through personal connections and clear articulation of benefits like access to quality workforce, research collaborations, and the potential social impact of participation. Reportedly, this may have been due to the project being in its early stages and not yet having specific 'products' the project partners could consult with their industry stakeholders.

"The participation of companies is still something that we have not achieved... Companies need more time to get motivated and engaged to participate (...). Our partner that deals with the companies... What they insist is that in order to engage companies we need first to give something to have something very specific, very concrete in order to engage them. (...) They do not participate from the beginning in something that's very vague and very... Not specific, not concrete."

Project partner in Greece

At the time of the interviews, the INVESTech project partners also planned to strengthen transnational cooperation through a full-day workshop on opportunity and challenges mapping, to be moderated by ASTRA. Having already conducted national-level workshops, they planned to focus next on addressing cross-country differences in legislation and other implementation barriers.

18.3. Results expected and achieved

Contribution to the development of qualifications

The INVESTech project makes contributions to qualification development primarily through its innovative approach to microcredentials in the ICT sector. Based on a comprehensive needs assessment across five European countries (Slovakia, Greece, Bulgaria, Cyprus, and Lithuania), the project identified critical skills gaps in advanced technology areas such as AI & ethics, big data, blockchain, internet of things, industry 5.0, quantum computing and ICT for sustainability.

The project is developing microcredentials structured across three qualification levels: basic (EQF level 4), intermediate (EQF levels 5-6), and advanced (for working professionals). For each advanced technology area, INVESTech project partners aim to develop three microcredentials tailored to these levels, resulting in 18-21 microcredentials in total.

While microcredentials offer flexibility for the dynamic ICT sector, the project faces challenges regarding accreditation frameworks. Project partners expressed uncertainty about who should accredit these qualifications and how to apply credit transfer systems like ECTS and ECVET.

Despite this, partners from higher education institutions showed commitment to make microcredentials "stackable" and establish microcredential-based hubs for reskilling and upskilling in ICT.

Besides microcredentials, the project plans to develop publicly accessible training materials, online courses focusing on both technical and transferable skills, and teacher training programmes on entrepreneurial and innovation skills in ICT. Additional activities include capacity building for VET staff on sustainability and developing a handbook for green transitions.

Contribution to enhancing the quality and attractiveness of VET

The INVESTech project enhances the quality and attractiveness of VET in ICT through several strategic approaches. By addressing skills mismatches in high-demand technology areas like AI, blockchain or IoT, the project makes VET more relevant to industry needs. The comprehensive needs assessment conducted across five European countries ensures that training directly responds to current labor market demands.

The project's focus on developing short-term, flexible microcredentials rather than traditional long-term qualifications makes VET more attractive to professionals in the fast-evolving ICT sector. This approach helps overcome the limitation of rigid accreditation processes that make traditional programmes quickly outdated.

INVESTech also aims to improve VET attractiveness through planned activities like hackathons, bootcamps, and skills competitions that create dynamic learning experiences. The planned summer schools specifically targeting women entrepreneurs in ICT address gender representation issues, making the sector more inclusive and diverse.

18.4. Success factors

Added value of INVESTech

The INVESTech project's methodical needs assessment effectively identified both technical and transversal skills gaps across five countries, revealing common patterns in the ICT sector despite regional differences. The assessment comprehensively mapped requirements across seven advanced technology areas and now informs the development of microcredentials which provide a suitable answer to the fast-evolving needs of the ICT sector. Unlike traditional long-term programmes, microcredentials can be quickly developed and deployed. The focus of the project on three different levels (EQF 4 to 6) also ensures appropriate learning pathways for different career stages.

INVESTech also includes specific ways to address green transitions in the sector. For example, the project partners are developing a module called "ICT for sustainability" as one of its focus areas, including topics such as efficient code development techniques that reduce computational resources and energy consumption, cloud technology optimization, including innovative approaches to data centre placement and cooling (such as underwater data centres), AI-powered smart systems that can make data-driven decisions about resource usage, or device management strategies - teaching when to activate or deactivate equipment to minimise energy consumption.

The INVESTech project also creates added value through enhancing education-industry cooperation in the ICT sector. By offering tangible engagement opportunities like microcredential piloting in Cyprus, the project gives companies concrete ways to influence skills development. In Slovakia, the focus on sustainability expertise attracts businesses seeking to reduce environmental emissions, creating mutually beneficial partnerships. The project's transnational dimension also addresses specialised training gaps by enabling access to expertise unavailable locally. Beyond these practical cooperation mechanisms, INVESTech strategically leverages existing regional networks like Kosice IT Valley (where ICT represents

7.5% of the employed workforce) to identify potential partners and mobilise stakeholders around the shared vision of ICT-driven regional development.

Potential for sustainability, scalability and transferability

According to our interviews, the project shows sustainability potential through its transnational collaboration where partners already pursue joint funding proposals as well as based on the activities that have taken place to date.

The consortium has completed initial skills needs assessments and organised national workshops across participating countries, establishing a starting point for stakeholder networks and shared understanding of the directions in which the project should address their objectives. Their planned activities include developing microcredentials, creating training materials, organizing events like hackathons and summer schools, and implementing teacher training programmes focused on entrepreneurship and sustainability.

While the project partners have faced some challenges in expanding their stakeholder networks, particularly with industry engagement, they are working on different approaches to address this. As one project partner noted, companies may become more engaged once concrete products like the microcredentials are being developed and companies receive a tangible opportunity to contribute to the project (e. g. by piloting microcredentials). The project's sustainability will ultimately depend on how effectively these initial activities and plans can be followed up by implementation.

Transferability may also stem from the standardised microcredential approach which is adaptable across regions as the microcredentials that are being developed should be applicable to each country's context.

18.5. Overall impact and lessons learnt

The INVESTech project is creating impact by developing 18-21 microcredentials across three qualification levels (EQF 4-6) in critical ICT areas like AI & ethics, blockchain or sustainability. This approach directly addresses the sector's need for both technical expertise and transversal skills while providing flexibility that traditional qualifications lack. By structuring microcredentials to be "stackable" and engaging educational institutions and industry partners in their development, the project is establishing innovative educational hubs that can respond effectively to the ICT sector's evolution while formalizing previously non-formal learning pathways in cases of training previously offered by companies but not formally recognised or available to the public.

19. MOSAIC – Mastering job-Oriented Skills in Arts & Crafts thanks to Inclusive Centres of vocational excellence

19.1. About MOSAIC

Background information

- **Project name:** MOSAIC – Mastering job-Oriented Skills in Arts & Crafts thanks to Inclusive Centres of vocational excellence
- **Duration:** 2022-2026
- **Call year:** 2021
- **Project status:** Ongoing

MOSAIC is a project led and coordinated by the Société d'enseignement professionnel du Rhone (SEPR), a vocational training institution in France¹¹⁷. The project involves 15 partners across 7 countries (Armenia, Belgium, Bulgaria, Canada, Finland, France, Italy) including VET providers, Higher Education Institutions, business actors, a mobility provider, a CCI Innovation hub and a multiplier organisation.

Objectives of the CoVE project

The MOSAIC project focuses on how to future-proof VET for arts and crafts and specifically for traditional and rare crafts, precious metals and jewellery, furniture and wood and their relationship with design, arts and industry.

The goals of the project are the following:

- **Improve collaboration between arts & crafts companies and VET centres**
- **Improve VET provision in arts & crafts by delivering new training modules**
- **Foster internationalisation and transnational strategies in response to changes in VET and society**
- **Provide forward-looking VET through the use of digital methodologies and tools¹¹⁸**

MOSAIC is the first CoVE to focus on training in the Arts and Crafts industry¹¹⁹. The European Arts and Crafts field represents a substantial challenge for the economy due to the twin transition as well as international and European competitiveness and requires an effective training system adapted to its professional challenges, as well as to the societal challenges related to rapid technological change, digitalisation, climate change, circular economy and new forms of work.

The platform of transnational cooperation set up within this project brings together relevant EU and non-EU partners who want to foster excellence in VET within the Arts & Crafts sector, ensure high quality skills that lead to quality employment and career-long opportunities, which meet the needs of an innovative, inclusive and sustainable economy.

¹¹⁷ <https://www.sepr.edu/>

¹¹⁸ [CoVE projects 2022 MOSAIC.pdf](#)

¹¹⁹ [MOSAIC BILAN ANNEE 1](#)

19.2. Activities of MOSAIC and skills developed

Activities covered

The activities of MOSAIC cover the following clusters:

- Cluster 1 – Teaching and learning:** This covers the training modules developed for both VET learners and teachers and trainers as well as the applied research conducted on training in Arts and Crafts. The study modules were developed in transnational teams: more than 70 people worked on the teaching and learning activities divided into six subject-specific teams. All VET schools were involved in the design of the courses, and they participated according to their areas of expertise in the Arts and Crafts sector. The modules were thus developed by vocational teachers, psychologists and professionals. The modules are available in six languages and include practical lessons, video tutorials, and gamified content. All modules were piloted with the aim of being available at the end of June 2025. These courses are available on the **Mosaic Moodle Platform**¹²⁰ which is linked to the European Observatory of Arts and Crafts "**Crafting the Future**"¹²¹ developed within the frames of the project and the platform will be accessible freely to everyone who registers.
- Cluster 2 – Cooperation and partnership:** This focuses on opening VET schools to the international dimension by developing mobility study programmes on arts and crafts for students but also mobility experiences for professionals within the industry for upskilling including young entrepreneurs. In the framework of the CoVE, a total of 138 mobilities are foreseen. The project carries out three different types of mobility: a Hackathon week (46 mobilities carried out: 33 students from Woodworking, Graphic Design, Jewellery Making, Industrial Design, and Shoemaking; 8 accompanying persons from Woodworking, Product Design, Graphic Design, Jewellery Making, and Furniture Making; and 5 experts in Hackathon Methodology, Woodworking, Digital and Graphic Design, Product Design, and Jewellery), two-week blended mobilities, and one-month placements in companies (102 students) and one-week mobility for Arts & Crafts sector professionals (36 mobilities). All the opportunities for students and professionals are showcased on the MOSAIC project website's *Catalogue*¹²² and are expected to be available beyond even after the end of the project. In addition, the project has developed an E-Learning pathway; an online course for teachers and staff to support them in organizing international mobilities. The modules provide information on different exchange projects, including those that are available for non-EU partners, practical information on how to organise sending and hosting activities for students, as well as concrete tools on managing blended mobilities. In addition, a Green Travel Guide has been developed as a supporting tool, to provide travelers and coordinators with the tools to reduce the environmental impact of travel and logistics associated with mobility activities. This is a transversal tool that has the potential to be applied well beyond the mobility activities of the project.
- Cluster 3 – Governance and funding:** This addresses the the long-term sustainability and scalability of the project's outputs. Key strategies include integrating the training modules into Vocational Education and Training (VET) curricula, disseminating project activities, and establishing a robust network of stakeholders and ambassadors in partner countries and beyond. Dedicated actions plans are being identified for the sustainability of each output and a quality plan was concluded in 2022.

The leadership of MOSAIC work packages is strategically distributed, featuring co-lead partnerships designed to create complementary exchange of expertise between different areas of expertise of organisations. Research is co-led by the University Jean Monnet (UJM, France)

¹²⁰ <https://training.craftingthefuture.eu/login/index.php>

¹²¹ <https://www.craftingthefuture.eu/>

¹²² <https://mosaiceuproject.eu/professionals-catalogue/>; <https://mosaiceuproject.eu/students-catalogue/>

and the Chamber of Commerce CCI Dobrich (Bulgaria). In parallel, teaching and learning activities are jointly managed by Omnia (Finland), a Vocational Education and Training (VET) provider, and the Chambre de Métiers et de l'Artisanat Lyon Rhône (CMA AURA, France). Dissemination and communication are led by the European Vocational Training network EfVET and the project's long-term sustainability by Materahub (Italy). Mobility and internationalisation strategy is led by UNISER (Italy), a specialised mobility provider..

Each European partner country cluster includes at least one VET school coupled with a representative from the business sector and higher education. Armenia and Canada add significant value as external non-European partners.

Skills developed

MOSAIC covers sectoral, digital, green and transversal skills¹²³:

- **Sectoral skills** include those related to wooden crafts, jewellery making, furniture making, arts and design.
- **Transversal skills** include social inclusion with the aim to help teachers develop inclusive education pathways for all learners, and entrepreneurship to enhance the employability of VET graduates, focusing on practical, market-relevant competencies such as effective self-promotion, creating viable business models, and strategically using online marketing and e-commerce platforms. Soft skills are also addressed such as problem solving, creative thinking and collaboration, across all modules and specifically within the scope of the Hackathon module. Internationalisation offers learners a transformative experience that strengthens a wide range of transversal skills. By studying or working in another country, they improve communication and language competences, while also developing adaptability, problem-solving, and critical thinking as they face new challenges and unfamiliar contexts. Collaborating in multicultural teams enhances teamwork, empathy, and intercultural awareness, while managing daily life abroad builds autonomy and self-confidence. Altogether, these experiences foster creativity, initiative, and global awareness, skills that are highly transferable to both professional and personal life..
- **Green skills:** To support the green transition, MOSAIC equips VET students in the Arts & Crafts sector with essential green skills. Learning to design sustainable craft products through hands-on activities, such as the **'Future of Making' workshop** and the **'From Waste to Wow' hackathon** held on 9-13 September 2025¹²⁴, which focused on upcycling and innovating with recycled materials.
- **Digital skills for arts and crafts industries:** The CoVE project introduced two innovative digital skills modules. The first focuses on 3D modeling for jewellery design using Rhino software, while the second, "Future of Making," covers digital fabrication tools – such as laser cutters, 3D printers, cobots¹²⁵, and CNC machines—for furniture making. Addressing digitalisation presents some challenges, as artisans often express concerns about new technologies, so the project's core philosophy has been to position digitalisation as a tool to support and enhance, rather than replace, traditional craftsmanship.

The “Future of Making” online course focuses on introducing innovative teaching methodologies for Arts and Crafts and, in essence, those to be adopted in the future by companies. In addition, multiple workshops led by Finland, France and Italy have brought together international groups of students, teachers and professionals (representing a range of Arts and Craft techniques).

¹²³ <https://www.craftingthefuture.eu/training/>

¹²⁴ <https://mosaiceuproject.eu/from-waste-to-wow-mosaic-craft-hackathon-lyon-france/>

¹²⁵ A cobot, or collaborative robot, is a robot designed to work alongside humans in a shared workspace. Unlike larger machines that run independently in a factory without human guidance, cobots can be integrated into the workflow alongside people.

Challenged based prototyping is taught, adopting a range of parameters such as designing a product using AI or recycled materials. For instance, a workshop in April 2025 in France¹²⁶ challenged students to design a wooden necklace from recycled wood, under the mentoring of jewellery makers and woodcraft professionals representing the MOSAIC partner countries. Four courses have been specifically developed for teachers and trainers focused on social inclusion, digitalisation, hackathon as a teaching methodology and an internationalisation course to support the organisation of as a supporting material for organising outgoing and incoming mobilities. The social inclusion course emphasises the importance of teachers' mindfulness and awareness of unconscious biases to foster positive learning environments. It also covers the design of courses tailored to diverse learners, featuring examples from Arts & Craft sector. The hackathon methodology has already been applied and tested during the International Skills Performance event in Lyon, gathering 33 students from the CoVE, as well as professionals from diverse sectors. An exhibition of the prototypes created by the students was exhibited to the public, illustrating the eco-friendly topic "From Waste to Wow".. Modules such as the "Future of Making" course not only aim to upskill students, but also furniture making teachers in VET schools. The E-Learning on internationalisation provides an overview of different exchange fundings that are accessible not only for EU partners but also for Canada and Armenia. There are specific modules on organising outgoing mobility (management and operational part), incoming mobility at school and in the companies as well as blended mobility materials

The CoVE adopts innovative pedagogies such as an immersive workshop experience within the jewellery making course. The digitalisation course for teachers and trainers provides operational knowledge on how to use digital tools and innovative pedagogies such as the use of the 'flipped classroom'¹²⁷ technique, plus methodologies and tools to make online training accessible to learners with physical and cognitive disabilities.

The development and structure of a number of modules have been guided and shaped by the European Competency Frameworks, including EntreComp for the entrepreneurship module and DigcompEDU for the digitalisation module.

19.3. Results expected and achieved

Contribution to the development of qualifications

The CoVE is currently implementing action plans to integrate training modules into VET Schools/Centres programmes and national curricula. Extensive mapping activities of the local context of each partner country has shaped the identification of the viable objectives and steps to be carried out in each country. Two groups have been created to gather different expertise and perspectives:

1. country cluster groups and experts of the local context,
2. type of stakeholder groups (educational providers, company representatives) for comparative and specialised analysis across the CoVE.

As training modules are available online and have been designed to be user-friendly, they can be adapted to each VET school/ centre and country.

Contribution to enhancing the quality and attractiveness of VET

The CoVE addresses skills gaps such as digital skills and entrepreneurship including marketing. Arts and Craft practitioners often have limited budgets for self-promotion. For example, the Future of Making module focuses on the use of new technologies for arts and crafts while the module on entrepreneurship helps VET graduates develop new skills on digital

¹²⁶ <https://sites.google.com/view/dnmade-workshop-2025/start>

¹²⁷ A flipped classroom is a type of blended learning in which students are introduced to content at home and have practice working through it at school. This approach reverses the traditional model of introducing new content at school and assigning homework to be completed independently at home.

marketing. These skills gaps were identified by a research analysis carried out at the beginning of the project by the higher education institutions of the CoVE with companies and VET teachers. Furthermore, the craft sector is vulnerable to changes brought by the green and digital transitions, such as the automation of craft techniques, AI-driven creation of content, and the need for more sustainable product design.

This sector is characterised by limited knowledge transfer, as craft practitioners seek to preserve their unique expertise, and the CoVE helps to foster this exchange of knowledge between companies and VET providers. The jewellery-making course, for example, offers a 360-degree view of a renowned jewellery workshop, although the CoVE is not allowed to reveal the name of the company.

The project actively supports national, regional, and local strategies to enhance the quality and attractiveness of VET. The study modules developed are now integrated into the curriculum of the Finnish partner VET and VET school OMNIA, and shared across the network of VET schools in Italy coordinated by Scuola Centrale di Formazione. New content regarding entrepreneurship and new technologies in furniture design have been introduced, for example.

Inspired by the Canadian Centre of Technology Transfer College model shared by Canadian partners CEGEP, Finnish partner WOODEN OY launched an additional mission, bringing together a delegation of 15 stakeholders, including policymakers, VET and higher education representatives, officials from the Finnish Ministry of Economic Affairs, and experts from the European Training Foundation, for a return visit to Canada, deepening the exploration of this model and its potential for Europe.

The impact of this engagement has already been felt. Under the leadership of the Finnish Ministry of Economic Affairs (notably, and not the Ministry of Education), VET and HEI representatives are now developing model proposals. A piloting phase is on the horizon, aiming to test and integrate this industry-focused approach into the Finnish educational landscape.

The MOSAIC experience has underlined a crucial point and opportunity to improve VET quality and attractiveness: vocational training is not only an educational challenge: it is a matter of national and European competitiveness.

The French partners have formally consulted with the French Ministry of Education, which provided substantive feedback on the developed modules. Ministry representatives indicated that the immersive jewellery workshop experience has significant potential for student career guidance and professional orientation in France. Furthermore, they noted that the 3D printing modules could be disseminated nationally for the training of VET teachers, addressing a current absence of such educational materials. The French Chambers of Arts & Crafts also intend to propose these modules for the continuing professional development of industry professionals.

In addition, Armenian educational authorities have expressed strong interest in integrating the modules on social inclusion, digitalisation, and jewellery into their national VET curricula.

To improve the quality of VET institutions, the higher education institutions of the CoVE have collected good practices from the VET partners of the project on topics such as sustainability, inclusion and R&D and have drafted general recommendations for VET providers¹²⁸. Efforts are also ongoing to increase connections between VET and higher education institutions, including discussions on pathway studies to better encourage VET students in arts and crafts to continue their studies at higher levels.

The CoVE is developing an Observatory for Arts and Crafts which is an online platform to connect the various stakeholder groups in arts and crafts, including VET students and professionals across Europe and in the CoVE partner countries. It showcases success stories of entrepreneurs and professionals, providing VET students with a better understanding of the realities of working in the field. Additionally, businesses may contact students about career

¹²⁸ <https://www.craftingthefuture.eu/scientific-hub/reports/>

opportunities as the Observatory provides a link for the MOSAIC Ambassador's Group on the Observatory's section "Business Hub"¹²⁹.

With regard to its relationship to European plans and initiatives, MOSAIC project is strategically aligned with key European policies and initiatives. It directly addresses the core tenets of the Pact for Skills by promoting a culture of lifelong learning, building strong skills partnerships, monitoring supply and demand, and advancing gender equality and equal opportunities. Within this framework, the associated CoVE has contributed within the Creative Skills Week in both 2024 and 2025, sharing outputs and achievements that have the potential to be applied across the Creative and Cultural Industry.

Furthermore, the project's objectives support the broader goals of the European Skills Agenda, the European Industrial Strategy, the Digital Education Plan, and the European Green Deal.

As part of its collaborative efforts, MOSAIC also participates in the CRAFTOUR initiative's working group on education¹³⁰. Through this network, it is contributing to a technical paper and policy recommendation for the European Commission on the establishment of a dedicated Arts & Crafts observatory.

MOSAIC is also linked to other international activities in the VET field. The Hackathon event organised by the CoVE in September 2024¹³¹ had an additional objective to promote VET excellence, working in coordination with the 47th WorldSkills Competition taking place at the same time in Lyon.

19.4. Success factors

Added value of MOSAIC

The CoVE has enhanced cooperation and mutual learning, leading to tangible results. The partnership capitalises on the specialised Arts & Crafts expertise of certain members, allowing other partners to benefit from their experience and enabling the CoVE to cover a comprehensive range of disciplines. For example, the jewellery making module was led by the French VET school as the Finnish VET school does not provide training in this field. The CoVE is also highly diverse including countries from varied geographical areas in Europe as well as non-EU countries. A significant outcome of this international exchange is that the Canadian partners, inspired by their EU counterparts, are launching their first-ever student mobility programme, which has the potential to become a standard practice

The project has developed various training modules that cover new sectoral and transversal topics, helping VET students to gain new skills and to improve their employability. These modules also support students who wish to start their own business in the Arts and Craft sector. For VET students, it offers new training modules on emerging sectoral and transversal topics to boost employability and support entrepreneurial ambitions. A core focus is on accessibility; the CoVE supports students with disabilities through dedicated online courses and a catalogue of virtual mobility options. VET teachers benefit from professional development focused on mastering digital tools and innovative pedagogical methods. Furthermore, an upskilling scheme will provide selected Arts & Crafts professionals with opportunities to observe work practices in partner countries. Currently in its pilot phase, the CoVE is being validated by external VET providers. The initial feedback has been highly positive, confirming the quality and relevance of the materials for both teachers and students. The CoVE has been conducive to the development of a skills ecosystem, and a knowledge triangle in arts and crafts. The first International

¹²⁹ <https://www.linkedin.com/groups/9854565/>

¹³⁰ <https://projects.madineurope.eu/craftour>

¹³¹ https://www.youtube.com/watch?v=JL-LqDVJz6Q&embeds_referring_euri=https%3A%2F%2Ftraining.craftingthefuture.eu%2F&source_ve_path=QTY3MTQ

Conference on Arts and Crafts and Design was held in France in April 2024¹³² in the framework of the CoVE and brought together stakeholders from VET education, higher education as well as researchers on arts and crafts who presented their research, helping to break down barriers between different sectors within arts and crafts. Business representatives and VET practitioners participated in roundtable discussions on evolving Arts and Crafts professions and the role of education and research. Additionally, about 50 students from the VET French School and the French university attended the event. The event aimed to bridge the gap between research and education in arts and crafts for mutual enhancement. The presence of representatives from the higher education institutions, VET schools and companies in each EU country contributes to fostering a skills ecosystem in the arts and crafts industry.

The collaboration between universities and VET centres has resulted in the creation of training modules. These modules are directly informed by a comprehensive skills analysis that the institutions conducted jointly at the project's outset.¹³³ This cooperation has also fostered a deeper mutual understanding. The partnership has provided higher education institutions with a greater appreciation for the important role of VET centres, which is particularly significant in an academic context where vocational education has historically been overlooked according to the CoVE project coordinators¹³⁴.

Potential for sustainability, scalability and transferability

The MOSAIC project has a Community of Practice dedicated to the **sustainability** of the project's outputs and partnerships and reflections on this topic began at the launch of the project. A first sustainability workshop was held in Espoo in Finland in 2024 followed by numerous online workshops. The CoVE is now in the phase of implementing the strategy for sustainability which was previously defined. The sustainability and dissemination package is led by EfVET which has experience of working on previous CoVEs. The package is also co-led by MaterHub, an Italian partner which is particularly useful in facilitating the sustainability of the projects' outputs because it is as an umbrella organisation for the cultural and creative industries.

To ensure the long-term sustainability of its outputs, the CoVE is developing advocacy kits for its partners. Currently in the testing phase, these kits are designed to equip partners with the appropriate language and terminology to effectively disseminate project results. By providing a tailored discourse, the kits will help partners harness opportunities for scaling and sustaining the project's impact. Three distinct versions have been created to target different stakeholder groups: educational providers, companies and professionals, and policymakers..

To ensure the long-term accessibility of its learning resources, the project will integrate them into national open-access platforms. Finland is already committed to this approach, which has been recommended to all partners. This strategy guarantees that the materials will be widely used and disseminated beyond the project's internal Moodle platform. The Observatory for Arts and crafts should be launched in May 2025 and will foster discussions on how to keep the partners engaged in the Observatory as well as how to attract new partners after the end of the funding period.

Regarding the sustainability of the partnerships, a working group dedicated to Creative and Cultural Industries has been launched in the framework of MOSAIC Ambassador's Group by EfVET, an umbrella organisation for VET providers. The working group will allow to provide visibility to the project's activities and results, by engaging its members (active in VET /arts and crafts, internal and external to MOSAIC) with such activities/results, including the Observatory and Moodle. After the project conclusion, the management and continuation of MOSAIC Ambassador's Group will be assured by EfVET under the CCI working group. The CoVE demonstrates a high potential for scalability and transferability. The training modules, available

¹³² <https://mosaiceuproject.eu/cimad-international-conference-on-arts-crafts/>

¹³³ <https://www.craftingthefuture.eu/scientific-hub/reports/>

¹³⁴ Interviews – Project coordinators

in six languages, are designed for broad adoption. The learning management system used by the project facilitates easy integration and adaptation of the modules into different educational systems, according to the project coordinators¹³⁵. The courses are versatile can be applied to both lifelong learning and formal education at various levels. For example, the courses on the creation of a digital portfolio is equally relevant for higher education students and entrepreneurs. In Finland, the Future of Making course will be used to train comprehensive school woodwork teachers on new equipment. This initiative is anticipated to better prepare students for pursuing Arts and Crafts studies in VET.

The Canadian model of innovation centres was explored by the CoVE during a study visit to the Canadian VET school¹³⁶. These are innovation centres used by both VET centres and enterprises in Canada. They facilitate innovation and research for companies that lack R&D facilities, which can be particularly relevant for the arts and crafts sector where most companies are SMEs. Companies hire teachers and students from VET centres to participate research work. These centres also enable the upskilling of teachers on digital technologies. Both the Finnish and the French governments are interested in this model, according to several interviewees¹³⁷¹³⁸¹³⁹, which could be expanded around Europe and to different industrial sectors.

Of particular note is an additional initiative inspired by the MOSAIC CoVE, driven by consortium partner Wooden OY, of another study visit in May 2025 by a multinational delegation from Finland, France, Italy, and Canada to Victoriaville, Quebec. The primary objective was to evaluate the applicability of the Cégep Technology Transfer Centre (CTTC) model within a European context. The delegation was hosted by Inovem, the École nationale du meuble et de l'ébénisterie (ENME), and Cégep de Victoriaville and included representatives of the Canadian Ministry of Education and the commercial representative of the Canadian Embassy.

The visiting delegation was composed of a diverse group of stakeholders, including European and Finnish policymakers, business representatives, and providers of both Vocational Education and Training (VET) and Higher Education (HE) from Finland.

Under the direction of the Finnish Ministry of Economic Affairs and Employment, Higher Education Institutions (HEIs) and Vocational Education and Training (VETs) providers across Finland will submit proposals in September 2025, detailing how the CTTC model could be integrated into their respective regional ecosystems. A transparent selection will follow, involving Municipality decision makers and other key stakeholders.

A series of pilot projects are then planned, to test various proposed CTTC models. The funding for these pilots will be secured in partnership with Business Finland, a governmental organisation that specialises in innovation financing and investment promotion. The objective of this phase is to identify a single, effective model that can be widely implemented across different sectors in Finland and the rest of Europe.

A technical paper is currently being written, in order to highlight the benefits of this model and how adoption could be facilitated in Europe, inspired also by this case study.

19.5. Overall impact and lessons learnt

The international cooperation between countries and diverse institutions has led to the development of well-informed training modules. Each partner contributed their unique expertise, enriching the content and ensuring its relevance. The project's success is further amplified by input from various stakeholders, which enhances vocational excellence, fosters closer

¹³⁵ Interviews – Project coordinators

¹³⁶ <https://mosaiceuproject.eu/a-great-study-visit-on-canadian-soil/>

¹³⁷ Interview – Project partner (chamber of commerce in Finland)

¹³⁸ Interview – Project partner (company in Finland)

¹³⁹ Interview – Project partner (multiplier organisation)

connections, and breaks down barriers within the sector. The collaborative environment has enabled partners to explore new methodologies, engage with researchers and businesses and consider innovative approaches to teaching and learning. A significant outcome of this international knowledge transfer is the identification of the Canadian innovation centre model. This model could have a substantial impact on research and development for both small businesses and VET centres, according to interviewees¹⁴⁰¹⁴¹.

The CoVE enables numerous student exchanges in the Arts and Craft sector, with 133 student mobilities foreseen. The students are empowered by these mobilities, according to an interviewee¹⁴², and create an informal network internationally in the Arts and Crafts sectors.

Feedback from interviews indicated a desire for more direct involvement from entrepreneurs and companies in the project, rather than relying on umbrella organizations like Chambers of Commerce. It was noted that with only one company serving as a partner, opportunities for direct exchange were limited. The project has significantly raised awareness of the diverse professions and challenges within the Arts & Crafts sector, both among partners and externally. The research produced by the CoVE will be made publicly accessible through its Observatory, providing policymakers and industry professionals with valuable insights. This data on skills needs and sector-specific challenges has the potential to inform strategic decisions at national and local levels.

The success of the CoVE is rooted in the strong commitment and deep involvement of its partners. The consortium has succeeded in building a very strong and cooperative network where every member is fully involved, willing to cooperate and contributing to the project's success according to several interviews.¹⁴³¹⁴⁴

¹⁴⁰ Interview – Project partner (chamber of commerce in Finland)

¹⁴¹ Interview – Project partner (company in Finland)

¹⁴² Interview – Project partner (chamber of commerce in Finland)

¹⁴³ Interviews – Project coordinators

¹⁴⁴ Interview – Project partner (multiplier organisation)

20. PoVE Water Scale-up

20.1. About PoVE Water Scale-up

Background information

- **Project name:** PoVE Water Scale-up
- **Duration:** 2022-2026
- **Call year:** 2021
- **Project status:** Ongoing

PoVE Water Scale-up is a Centre of Vocational Excellence coordinated by Firda – CIV Water in the Netherlands, focusing on advancing skills and qualifications for the water sector across Europe and beyond.

The project is a follow-up to the successful pilot initiative that began in 2019, with Estonia, Germany, and South Africa joining as new partner countries alongside the original partners from the Netherlands, Malta, Czech Republic, and Latvia. It brings together 23 partners, including VET institutions, industry leaders, academic institutions, and NGOs.

The project is organised around four main Regional Centres of Vocational Excellence (CoVEs) in Water, each with its own designated regional 'captain' that acts as a primary coordinator:

- The Mediterranean region - led by Malta
- Central Europe region - led by the Czech Republic
- The Baltics region - led by Latvia
- The West EU region - led by the Netherlands
- South Africa region - led by South Africa

Objectives of the CoVE project

The European and global water sector faces several critical challenges requiring the development of a skilled workforce across the industry. Some of the major challenges can be summarised as follows:

- **Climate change impacts:** increasing frequency of extreme weather events (floods, droughts) and overall changing climate patterns creating urgent need for resilient water management systems and infrastructure adaptation.
- **Circular water economy:** growing pressure to transition from linear wastewater treatment to circular approaches that recover valuable resources (nutrients, energy, cellulose) from wastewater streams, as can be exemplified by innovations such as those mentioned by the partners in the Netherlands where cellulose from wastewater is used to create materials for infrastructure (specifically bike lanes).
- **Water quality monitoring:** rising complexity in detecting and treating emerging contaminants requiring advanced monitoring technologies like highly sensitive sensors for real-time water quality assessment.
- **Infrastructure modernisation:** aging water infrastructure needing significant upgrades with integration of smart technologies while ensuring continued service provision.
- **Digital transformation:** integration of automation and data analytics into water management, requiring upskilling of professionals as well as updated curricula in schools and higher education institutions.
- **Sustainable water management:** balancing water needs across sectors (drinking water, industry, agriculture, ecosystem maintenance) while ensuring long-term sustainability of water resources.

- **Skills-education gaps and attracting talent into the industry:** traditional education struggling to keep pace with rapidly evolving technologies and approaches in the water sector, representing an opportunity to draw new talent into the industry by aligning industry needs and educational provision.

The PoVE Water Scale-up project addresses these challenges through a network of regional Centres of Vocational Excellence involving seven countries. It develops innovative, practice-oriented curricula and interactive learning materials, including VR technologies that simulate water facilities. Through its hybrid (or workplace simulation) learning environment, the project connects VET institutions, higher education, and water companies to create real-world training experiences in water quality monitoring, circular water systems, and infrastructure modernization. Innovative approaches implemented to date have included students and professionals working on actual case studies like underwater drone monitoring of water quality, wastewater treatment innovations, and climate adaptation planning for municipalities. Additionally, international mobility programmes, hackathons, and educational exchanges have contributed to strengthening water sector workforce development while raising public awareness about water sustainability.

An improved governance structure

Before this case study outlines the activities covered by the project, it is worth noting that particular emphasis in this project has been on developing a functional governance structure. A new governance structure was needed in response to the project significantly expanding the partners' network since its pilot. According to the project coordinator from the Netherlands, a top-down management structure was no longer sufficient to meet the project aims as it did not allow for responsiveness to unique regional contexts and created inefficiencies in coordination. Hence, the partners had to develop a new way of collaborating and did so by increasing autonomy in different regions.

By appointing regional captains who serve as primary coordinators within their region, the project implements a bottom-up management structure and eliminates common bottlenecks prevalent in traditional top-down structures, such as lack of information flow and limited partner buy-in. According to our interviewees, the bottom-up approach creates clear lines of responsibility while allowing for regional autonomy, enabling partners to adapt their activities to their specific cultural and institutional contexts. The regional captains facilitate efficient communication in local languages, coordinate activities among partners in their region, and bring a sense of ownership that drives proactive engagement.

"With the growing amount of partners we saw that we couldn't continue this [top-down] structure because it was really not focusing on sustainability (...) because they [project partners] were still waiting for us to tell them what to do. So we created a bottom up approach...(...). One of the key success factors that is that we create the opportunity, but also we create space to those regional partners to develop activities by fitting them into their regional setting and cultural settings. We can't take the blueprint of my hometown and transfer it into Latvia, for instance, or to Malta, because they work differently."

Project coordinator commenting on the newly developed governance structure

According to our interviewees, this decentralised structure has allowed for stronger personal connections between partners, increased motivation through direct responsibility, and improved the project's responsiveness to regional needs. According to our interviewees, this innovative governance model enhances current project operations while also building sustainable relationships.

"In other COVEs, communication is always through the lead partner and the regional/country partners are a little bit more passive. Having one person who is the main contact in the country [a regional captain] is much better, because they can discuss things in the country in their own language... but it's also about efficiency, the lead partner can't engage everyone... participation of companies is still something that we have not achieved... Companies need more time to get motivated and engaged to participate.(...). Our partner that deals with the companies..."

Partner representative from Germany engaged in impact assessment exercises of various CoVE projects commenting on her perception of PoVE Water Scale-up

20.2. Activities of PoVE Water Scale-up and skills developed

Activities covered

The PoVE Water Scale-up project is developing activities across six key areas:

- **Networks building and governance:** The project implements activities to establish sustainable ecosystems connecting education providers, industry partners, companies, and public authorities and fostering cooperation between higher education institutions and VET providers through applied research and joint projects. It does so by implementing a bottom-up approach through regional captains who exercise distributed leadership in the governance of Centres of Vocational Excellence.
- **Development of learning materials:** The PoVE Water Scale-up project has developed water education materials including modular courses for secondary schools, interactive educational games on water management history, virtual reality scenarios for wastewater treatment operations, university-level courses, and improved occupational qualifications for water professionals. Materials utilise cutting-edge technologies like VR and gamification while addressing practical industry skills gaps across multiple educational levels.
- **Development of qualifications:** The project has developed educational modules, courses, and some qualifications across partner countries. Examples include water management modules in Czechia, accredited university courses and continued improvement of occupational qualifications in South Africa, and plans for a new EQF level 4 qualification in the Baltic region. Partners are also planning to develop microcredentials, including international ones, for continuous professional development.
- **Raising public awareness and promoting the water sector:** The project has organised public awareness campaigns including Water Days, Water Conferences and outreach activities to both kindergartens and schools to support basic water literacy. Partners created short stories about water professionals, issued press releases on water conservation, and engaged policymakers at events to advocate for increased sector wages and recognition.
- **Facilitating international learning experiences:** The project has organised international mobility events including summer schools, winter schools, teacher weeks, and hackathons where students and professionals from multiple countries collaborate on water challenges, providing hands-on learning experiences across different cultural and educational contexts.
- **Facilitating industry-education alignment:** Partners have developed curricula with industry experts using real company cases, established formal partnerships through Memoranda of Understanding, and created hybrid learning environments where companies contribute directly to education (see quote below).

"In the hybrid learning environment, the work field is taking responsibility for educating youngsters and professionals, together with education and teachers. It's not that companies only have a wish list of what they want to know - they are working together on educational activities. Equipment is brought in, and students also learn at the physical locations of companies. We have a water application centre where various installations and setups from companies are available for both education and research purposes. We bring in real cases and challenges that companies are struggling with, and our teacher guides the process as a facilitator rather than the sole knowledge provider. Through this, the teacher also gains new insights into activities from the work field. "

Interviewee from the Netherlands describing the innovative ways of bringing industry partners and education providers together to provide up-to-date education

Skills developed

Green and sustainability competencies among the general public

The project develops public understanding of environmental protection and water management sustainability. Interviewees emphasised that water work often suffers from being *"taken for granted"* – people expect seamless water services without appreciating the skilled workforce required. This contributes to sector recruitment challenges, making public awareness of how individual actions affect groundwater quality and the importance of water professionals crucial for long-term sustainability.

Technical expertise and knowledge among students

Students develop comprehensive water sector competencies across three key areas. In relation to **water treatment and quality management**, they learn about water quality improvement processes, water treatment technologies, risk mitigation strategies, regulatory compliance, and groundwater contamination prevention. A focus on **landscape and environmental water management** provides an understanding of river systems, including meandering patterns and sediment processes, or historical perspectives on water management practices (such as in the case of an interviewee who mentioned a focus on the evolution of Czech landscapes from the 11th-12th centuries to present). **Hands-on technical skills** are developed through practical exposure to treatment facilities, with interviewees citing examples of topics covered for students ranging from risk assessment construction, water quality testing in karstic systems¹⁴⁵, and laboratory techniques including microscopy procedures.

Digital and technological competencies among students

The project incorporates innovative digital learning through VR-based experiences. Examples include interactive river system exploration with Google Earth integration and wastewater treatment plant simulations where students practice responding to operational alarms. Beyond VR, participants develop broader digital skills through various tools used in learning material creation. Importantly, all project partners benefit from a shared resource of a VR expert who facilitates meaningful transformation of didactic materials into the technological interface of VR, ensuring technological interoperability of VR learning modules between systems.

Pedagogical skills development among teachers

Interviewees mentioned that in some cases, they adopt evidence-based educational approaches, including Bloom's taxonomy principles for learning outcome design. The project also develops tools for assessing skill development and measuring impacts of international activities on student learning and professional development. Although these tools have been developed and implemented by partners who specialise in impact assessment, from our interviews it was not fully clear to what extent individual educators use these evaluation tools to understand and improve their own instructional effectiveness in classroom settings.

¹⁴⁵ Landscapes characterised by unique features like sinkholes, caves, and underground drainage, formed by the dissolution of soluble bedrock such as limestone, dolomite, or gypsum.

Nonetheless, the project conducts mapping of skills development on the individual level of project participants.

20.3. Results expected and achieved

Contribution to the development of qualifications

During its implementation, the PoVE Water Scale-up project has successfully developed and enhanced several qualifications across partner regions, with achievements in both formal qualification frameworks and innovative learning pathways.

In **South Africa**, an interviewed representative of Stellenbosch University reported that the university has played a pivotal role in developing water-related occupational qualifications through collaboration with the Energy Water Sector Education Training Authority. The university contributed expertise to the development of three key qualifications:

- **Water Conservation Practitioner** – a college-level occupational qualification in VET (upper secondary).
- **Sanitation Worker** – developed in collaboration with the University of the Western Cape experts.
- **Water Works Management Professional** – originally developed in 2016 and officially registered in 2020, now being implemented and piloted through the PoVE project.

The implementation approach involves Stellenbosch University supporting Capricorn TVET College in **piloting the Water Works Management Professional curriculum**, with university lecturers providing direct support and professional advice. This includes helping the college establish its own water treatment facility for practical student training.

In **Estonia**, the project is developing new qualification pathways to address critical workforce shortages in the water sector. The Estonian team, comprising Järvamaa Vocational School and the Estonian Water Works Association, is working to expand access to water treatment education. Currently offering a **Water Treatment Operator speciality at EQF level 5** (college level), the school is currently planning to open a **new EQF level 4** speciality for students coming directly from elementary school, starting in autumn 2025. The partners are also developing learning materials and learning outcomes that will be used for both the existing level 5 course and the new level 4 pathway.

In the **Czech Republic**, the CoVE Central Europe has developed four comprehensive learning modules focused on water in landscape management, designed as integrated subjects for secondary schools:

- **Module 1: Water courses in landscape** – 3 ECVET credits at EQF levels 4-5
- **Module 2: Water reservoirs and water management systems** – 3 ECVET credits at EQF levels 4-5
- **Module 3: Retention of water in water courses** – 3 ECVET credits at EQF levels 4-5
- **Module 4: Watershed management and protection** – 3 ECVET credits at EQF levels 4-5

These modules are specifically designed for secondary vocational schools, particularly construction schools and ecological lyceums, and are structured as year-long subjects requiring 1.5 hours per week. The modules are being developed in both English and Czech versions, with the Czech version including PowerPoint presentations that teachers can use directly in their lessons.

According to our interviews, other partners are working on the development of qualifications in other regions in a similar manner, but the project coordinator does not centrally hold information about specific activities that are being implemented in each regional CoVE.

Contribution to enhancing the quality and attractiveness of VET

The project takes a decentralized but systematic approach to integrating modern technology, helping to address longstanding challenges in VET while better engaging today's learners. The Czech partners have developed comprehensive VR scenarios that allow students to experience river management operations firsthand and measure water channels using interactive controllers. This approach tackles two key issues: limited access to specialized equipment and the challenge of maintaining student attention in traditional learning environments. Estonian partners have adopted similar VR applications to provide laboratory experiences that would otherwise be unavailable at their facilities, showing how technology can help bridge resource gaps without compromising educational standards or student engagement.

The project works to make VET more attractive through international experiences that expose students to professional environments while developing their cultural competencies. The Water Days programme in Brno exemplifies this approach, bringing together secondary students from eight schools across five countries for intensive week-long programmes. Estonia hosts regular Winter and Summer Academies with similar goals. These mobility experiences help address workforce challenges in the water sector by showcasing career opportunities across European markets, potentially making water sector careers more appealing to young people.

Quality enhancement comes through strategic partnerships that bring together academic expertise, industry knowledge, and community engagement. Stellenbosch University in South Africa has established formal relationships with major water utilities companies and municipalities through Memoranda of Understanding, creating what could be described as comprehensive skills ecosystems with formalised commitment to continuity. Czech partnerships with environmental organization Lipka have produced innovative educational games and public awareness campaigns, suggesting that well-established collaborations between subject matter experts and educators have the potential to amplify both educational impact and sector attractiveness.

The project demonstrates a commitment to evidence-based approaches in curriculum design. The Czech team applies Bloom's taxonomy principles when structuring learning outcomes and incorporates storytelling methodologies (such as "the story of the river") to make technical content more accessible and engaging. These approaches reflect a broader shift towards diverse and interactive pedagogies in VET, moving beyond simple content delivery towards more sophisticated instructional methods.

Rather than positioning secondary level VET institutions as passive recipients of teaching materials, the project encourages them to take an active role in curriculum development. In the Czech Republic, secondary schools independently developed student modules after Mendel University established the initial academic framework, with academics providing quality oversight rather than direct instruction. This approach has contributed to building internal expertise within secondary schools while ensuring that materials remain directly relevant to VET teaching contexts, supporting both quality improvement and local ownership of the educational process.

20.4. Success factors

Added value of PoVE Water Scale-up

The PoVE Water Scale-up project contributes to the field of international VET collaboration through its implementation of a decentralized governance structure that addresses common coordination challenges in multi-partner educational initiatives. By establishing regional captains as autonomous coordinators, the project has created a management approach that allows for local adaptation while maintaining overall project coherence. This structure appears to reduce the communication bottlenecks typically associated with centralized coordination models and enables partners to develop activities that align with their specific cultural and institutional contexts. The governance model represents a practical response to the scalability challenges

that emerge when educational partnerships expand beyond their initial pilot phases, offering insights for other large-scale VET collaborations operating across diverse regulatory and cultural environments.

The project's educational approach combines technology integration with industry partnerships to address specific challenges in water sector training. The use of VR simulations and interactive learning materials serves to overcome practical constraints such as limited access to specialized equipment and the need for safe training environments in technical fields. The project's industry-education partnerships extend beyond traditional placement models by involving companies directly in curriculum development and providing real-world case studies for student learning. This approach to creating "hybrid learning environments" represents an effort to bridge the gap between educational provision and industry needs, while the international mobility components provide students with exposure to different professional contexts. These elements collectively contribute to addressing the water sector's workforce development challenges while enhancing the practical relevance of VET programmes in this technical field.

Potential for sustainability, scalability and transferability

Sustainability

The project demonstrates sustainability potential through multiple complementary mechanisms. Institutional commitment is evidenced by South African formal Memoranda of Understanding established between partners such as Stellenbosch University and water sector employers, water boards, municipalities, and vocational education and training institutions, creating binding partnerships that extend beyond the project period. Financial sustainability in South Africa has also been supported by already secured co-funding from the Energy Water Sector Education Training Authority, totaling €142,000 for student bursaries, professional development, and student internships.

Based on the PoVE Water Scale-up coordinator's information, the project internationally also demonstrates strong sustainability outlooks with multiple forward-looking initiatives in development, including the H2OConnector application that will continue PoVE Water results with five network partners, alongside ongoing participation in the established Water4all Horizon project and emerging opportunities through EIT KiCK Water and Strategic Alliances (currently applying).

In addition to funding, the development of embedded learning materials provides long-term value, with resources being made freely accessible through the PoVE website for institutional use, and partners like Estonia integrating these materials into new EQF Level 4 qualification programmes. Additionally, network effects generated through hackathons and mobility activities have reportedly created lasting personal connections between partners, which participants identified as crucial for sustained motivation and ongoing collaboration.

Scalability

The project exhibits scalability potential through proven expansion mechanisms and organizational structures. Geographic expansion has been successfully demonstrated, with the initiative growing from four original Centers of Vocational Excellence to include additional partners. The pilot of the project started with five countries and 13 partners and expanded in the current project to seven countries and 23 partners. The implementation of a regional captain structure enables efficient scaling by designating coordinators for each region rather than managing individual partnerships directly, creating a more manageable approach as the network expands. While decentralized, the partners still follow a common framework for the development of learning units across regions. Each partner develops three to four learning modules using common platforms such as WARP Studio for virtual reality scenarios, achieving consistent learning units that can be systematically replicated in new contexts.

Transferability

The project demonstrates transferability potential through flexible design principles and diverse application mechanisms. Learning materials are structured as modular components that institutions can integrate into curricula based on local requirements rather than prescriptive programmes, allowing different regions to address varying water challenges while maintaining similar educational approaches. The hackathon methodology, which brings together vocational education students, university students, professionals, and non-water sector experts to solve practical problems, has proven applicable across diverse sectors beyond water management. Knowledge transfer mechanisms include international exchanges, such as Dutch students visiting South African institutions, and formal partnerships between institutions like Capricorn College in South Africa and the Aeres group of vocational colleges in the Netherlands. The focus on addressing common sector challenges including aging workforce demographics, wage structures, and skills shortages makes solutions developed in one context relevant and applicable to others facing similar issues.

Limitations

Several limitations constrain the project's long-term viability and expansion potential. Resource dependencies present ongoing challenges, with partners such as Estonia indicating that continued external funding is necessary to maintain quality programming and adequate facilities, suggesting that financial sustainability remains problematic. Policy-level changes, particularly regarding wage improvements in the water sector (as mentioned by the Estonian partners), require sustained advocacy efforts that extend beyond the project's direct sphere of influence and may impact long-term success. Cultural adaptation requirements limit direct transferability, as approaches developed for specific contexts may not be applicable elsewhere; for instance, Estonia's focus on sparsely populated areas lacks relevance for densely populated regions such as Malta. These constraints indicate that while the project demonstrates strong potential across multiple dimensions, successful implementation requires careful consideration of local contexts and sustained resource commitment.

20.5. Overall impact and lessons learnt

The PoVE Water Scale-up project demonstrates impact through its innovative approach to addressing water sector workforce challenges across seven countries. The initiative successfully developed qualifications, enhanced VET attractiveness through technology integration, and created sustainable industry-education partnerships that extend beyond traditional placement models.

The project's potentially most valuable lesson centers on governance innovation. By implementing a decentralized structure with regional captains rather than top-down coordination, the initiative overcame common bottlenecks in multi-partner collaborations while enabling cultural adaptation. According to stakeholders interviewed for this case study, this bottom-up approach fostered ownership, improved communication efficiency, and allowed partners to develop activities suited to their specific contexts.

Key outputs include the development of comprehensive learning materials utilizing VR technology, creation of formal qualifications across multiple EQF levels, and establishment of hybrid learning environments where industry directly participates in education. The project's international mobility programmes and public awareness campaigns further enhance sector attractiveness.

The initiative's sustainability is evidenced through formal memoranda of understanding, secured co-funding, and embedded learning materials accessible beyond the project period through the project website. However, ongoing resource dependencies and the need for policy-level advocacy remain challenges. The project's transferable methodologies, particularly its governance model and modular learning approach, offer valuable insights for future large-scale VET collaborations across diverse sectors and contexts.

21. PROMOTE – Promoting Integrated Professional Development for Prison Practitioners in Vocational Excellence for Offender Reintegration

21.1. About PROMOTE

Background information

- **Project name:** PROMOTE – Promoting Integrated Professional Development for Prison Practitioners in Vocational Excellence for Offender Reintegration
- **Duration:** 2024-2028
- **Call year:** 2023
- **Project status:** Ongoing

PROMOTE is a project led and coordinated by Penitenciarul Timisoara. The coordinating country is Romania.

It involves seventeen partners across ten countries (Denmark, Germany, Hungary, Italy, Lithuania, Netherlands, Portugal, Romania, Spain, and Türkiye). The partners involved include education and training institutions/providers, private companies, national authorities, and civil society organisations. Each partner represents a key category of stakeholders in the correctional ecosystem.

Objectives of the CoVE project

PROMOTE aims to provide a learning experience that will transform the way professionals support individuals in prison. It offers tailored training and upskilling opportunities that foster empathy, respect, and practical problem-solving. PROMOTE covers every practitioner who delivers activities inside prisons or works with people under criminal-justice supervision. This includes uniformed prison officers/warders, re-education or treatment officers, probation and reintegration staff, teachers and VET trainers, psychologists, social workers, health and addiction specialists, NGO/volunteer coordinators, employment advisers, and other community actors involved in offenders' transition to society.

By encouraging collaboration across disciplines, PROMOTE aims to build a community of professionals committed to positive change in the prison system. Its learner-centred approach is aimed at ensuring that its development is relevant and impactful.

Through the creation of accessible physical (as opposed to virtual) CoVEs in the PROMOTE partners' countries, PROMOTE aims to democratise learning, support participatory research, and empower practitioners to lead community-driven solutions. It also seeks to recognise prior learning and offer micro-credentials delivered by VET providers and recognised by employers (the public sector bodies keeping permanent staff on their payroll inside the correctional system).¹⁴⁶

"We are working on an ecosystem that is ignored due to all the negative connotations. So we are bringing visibility to this ecosystem and shedding a positive light on it. We want to show respect and appreciation to a professional category that suffers from stress and disservice. It is a most modern approach, bringing pedagogy to a context where it was inexistant until now."

PROMOTE coordinator

Overall, the long-term objective of the CoVE is to bring change to the way the correctional field and the wider justice system is approached in Europe and build the confidence of correctional actors. It seeks to bring visibility to an unknown yet essential professional sector and work for its inclusion in EU strategies.

¹⁴⁶ These include prison services, probation directorates, and ministries of justice.

21.2. Activities of PROMOTE and skills developed

Activities covered

The activities of the CoVE project are delivered by the consortium partners with the responsibilities distributed according to their different areas of competence. This collaboration allows the project to comprehensively address the specific needs of the correctional sector.

For Cluster 1, the activities involve **training and upskilling** of correctional staff and **development of curriculum framework** to support the work of correctional staff in promoting social inclusion, employability, and reintegration of convicted individuals. Academic partners (one VET provider and three universities) lead the development of didactic content and standardised curricula. These institutions ensure that the training materials are pedagogically sound and aligned with the European Qualifications Framework (EQF) and the European Skills, Competences, Qualifications and Occupations (ESCO) framework. Alignment with the evolving needs of the sector is also ensured. Other universities provide additional expert input and piloting. Training organisations contribute their expertise in educational design and delivery, while correctional institutions provide practical contexts for testing and validating the training programmes.

For Cluster 2, the project includes **establishing and fostering collaboration and coordination** among different sectors and agencies involved in community integration of convicted persons. Social partners and civil society organisations facilitate collaboration between correctional institutions, NGOs, volunteers, and employers. Activities for this cluster also include the development of digital tools and platforms by partners like SkillLab and Progress Consult (PC), enhancing collaborative and personalised learning experiences. These partnerships ensure that the training programmes are relevant, inclusive, and adaptable to various correctional settings.

For Cluster 3, governmental and regulatory partners provide strategic and institutional support, integrating CoVEs into national policies. Coordinating partners oversee project management, sustainability, and financial compliance, ensuring that the project adheres to its objectives and delivers expected results. This structured approach to governance and funding ensures that the PROMOTE project remains aligned with both national and European priorities, fostering a sustainable and scalable model for vocational excellence in the correctional sector.

At time of writing, the PROMOTE has developed its management plan and constituted the large evidence base that will support the next planned activities. The project has produced the Project-Management Handbook and the Quality-Assurance Plan which provide the groundwork for the project's management, steering day-to-day coordination and evaluation.

PROMOTE has also conducted extensive data-collection activities, seeking to involve external stakeholders through various means such as workshops and consultations. At the institutional level, the project has collected data in seven different countries to capture on-the-ground skills needs and inspiring practices to be incorporated into a shared competency framework across all partners. Key skill gaps identified through these activities included: transversal skills (such as communication, empathy, emotional intelligence, and conflict resolution); digital and data management skills necessary for modern correctional and rehabilitation work; and teamwork and interagency collaboration competencies, especially for multidisciplinary settings. Specific practices were also identified as inspiring for their strong rehabilitative value, replicability, and alignment with European priorities such as sustainability, digital transition, and inclusion. Key examples included two programmes in Portugal, a training in sustainable agriculture, where inmates cultivate vertical gardens and distribute food to low-income families, as well as an innovative vocational education programme where inmates raise edible crickets.

Seven National Adaptation workshops were then conducted to validate and fine-tune the occupational profiles against each country's legal and operational context. The occupational profiles comprised prison officers, re-education professionals, probation and reintegration experts, psychologists, social workers, teachers and vocational trainers, and medical staff. Over

120 professionals from eight different countries took part and assessed the relevance, language, and structure of each profile and proposed adaptations to better reflect national contexts. Crucial differences were uncovered and taken into account in the project's modular curricula. Finally, to foster cross-border convergence, the project ran a Europe-wide validation webinar with the European Basic Skill Network (EBSN) which served to inform the refinement of the modules developed. The "Occupational Profiles and Ecosystem Map" currently being finalised by the consortium partners will provide an overview of roles, relationships and collaboration pathways among all stakeholders.

In the next phase, the higher education institutions and VET provider will translate the validated occupational profiles into modular curricula and micro-credential descriptors while prison services will equip eight CoVEs inside real facilities. Then, three six-months pilot cohorts will follow the designed courses.

Skills developed

PROMOTE covers a wide range of skills essential for professionals in the correctional sector. These include:

- **Transversal skills:** The project promotes communication, teamwork, critical thinking, and emotional intelligence, which are crucial in correctional and interinstitutional settings. The project also covers multi-disciplinary Continuing Professional Development, trauma-informed practice, motivational communication, and crisis management, which are key for dealing with vulnerable individuals.
- **Occupation-specific skills:** Training focuses on correctional practices, rehabilitation, risk assessment, security protocols, and reintegration strategies for justice professionals and support staff.
- **Green and Digital skills:** Digital competencies are developed through training in online platforms, digital learning tools, and the use of digital certification. Environmental awareness and sustainable practices are integrated into the training modules.
- **STEM skills:** Elements of STEM are incorporated, particularly in digital modules covering ICT tools, platform use, and data management.
- **Other skills:** The project also addresses civic and intercultural competencies relevant to working in diverse, high-risk environments.

The development of these skills is planned through several concrete activities, including:

- Establishment of CoVE in all partner countries, offering learner-centered and certified training programmes;
- Six-month structured educational programmes with a combination of face-to-face and online sessions, facilitated by trained professionals;
- Two-day transnational training sessions offering joint experiences for cohorts from different countries;
- Learning platforms to support asynchronous and self-paced learning, practical exercises, and community interaction; and
- Workshops and simulations, such as the Developing A CURriculum (DACUM) methodology and policy review exercises, enabling professionals to co-create training content.

Several innovative methods and pedagogies have been developed to enhance the learning experience. Scenario-based learning, adapted to the realities of correctional settings, helps learners apply theoretical knowledge to practical situations. Blended learning combines online and in-person modules to provide a flexible and comprehensive learning experience reaching learners based in different countries. Micro-credentialing offers modular learning paths that allow for the recognition of specific skills and competencies. Additionally, transnational communities of practice foster knowledge exchange and peer learning across countries.

Another innovation stemming from this CoVE is the overall development of a correctional pedagogy. This field is currently absent from the mainstream VET conversation in Europe, and is needed to allow professionals and practitioners to link between the learning and professional fields.

PROMOTE supports the professional development of trainers and professionals working within or in connection with the correctional system through various means. These include face-to-face and online training sessions that focus on correctional education, peer learning opportunities that encourage the exchange of good practices between countries and institutions, and the development of tailored educational resources that address the specific needs of learners in the criminal justice context. The project also promotes interdisciplinary collaboration to enhance the quality of training.

The PROMOTE project uses digital technologies principally to support flexible and inclusive training delivery, particularly through online platforms and blended learning approaches. The focus has been to support learners and trainers across different partner countries with accessible and scalable digital solutions.

PROMOTE aligns its training outcomes with several EU skills frameworks. DigComp guides the development of digital competence in both trainers and learners, especially through platforms like SkillLab and blended learning modules. GreenComp is integrated to promote environmental awareness and sustainability across training content. ESCO and EQF are used to align training outcomes with EU-wide occupational standards.

Through this, PROMOTE aims to create a sustainable, high-quality Centre of Vocational Excellence for correctional-sector practitioners, enhancing their skills and contributing to the overall improvement of VET in the correctional field.

21.3. Results expected and achieved

Contribution to the development of qualifications

PROMOTE plans to make significant contributions to the development of qualifications within the correctional sector, according to the project coordinator and the consulted consortium partners.

One of the key expected results of PROMOTE is the design of new qualification structures and the improvement of existing ones to better meet the needs of correctional VET. The project focuses on a competency-based approach rather than qualification-based. It seeks to strengthen the relevant competencies for the upskilling and re-skilling of the various professional profiles existing in the correctional ecosystem.

Still, the training content is designed to align with national qualification standards, incorporating updated learning outcomes and competence descriptors. These developments are expected to serve as a foundation for potential future integration into national qualification frameworks.

The project also takes advantage of the growing emphasis on micro-credentials, which offer enhanced flexibility and adaptability to real-world professional contexts. Micro-credentials and joint training modules are being developed in collaboration with VET and higher education partners to enable modular learning and flexible upskilling pathways, particularly for professionals in the correctional and justice sectors. The first pilots of these modules are planned for the upcoming project phase.

The project engages national authorities and regulatory bodies in the validation of training modules and in discussions regarding qualification recognition. While no qualifications have yet been officially recognised at national or transnational levels, the dialogue with relevant institutions is ongoing, and mechanisms are being prepared to facilitate future recognition across partner countries. The project promotes ongoing dialogue with relevant stakeholders to support the development and recognition of informal and non-formal learning experiences in the future.

Contribution to enhancing the quality and attractiveness of VET

PROMOTE seeks to increase awareness and prioritisation of vocational training in the justice and correctional sectors across partner countries. It is working to facilitate the development of structured training pathways for professionals in this field and contributed to aligning these efforts with national VET standards and institutional practices. In the longer run, the project foresees the production of materials related to the learning experience developed which VET providers can incorporate and adapt to their own offers.

At national level, by addressing the specific skills needs within the justice sector, the project seeks to contribute to national priorities related to workforce development, reskilling, and the social reintegration of incarcerated individuals.

According to the project coordinator, this approach will strengthen the coherence and impact of VET, fostering robust partnerships with public authorities, training providers, NGOs, and correctional institutions. These collaborations facilitate joint development of training content and improve alignment between education and labour market needs, which should, according to the project coordinator and partners, contribute to enhancing the overall quality and relevance of VET provision.

PROMOTE is developing tailored training curricula based on needs assessments, addressing gaps in digital competencies, restorative justice, mental health support, and reintegration strategies. Pilot training sessions will allow real-time feedback and iterative improvements, aimed at ensuring relevance and accessibility. The use of micro-credentials aligned with EU frameworks aims to facilitate the recognition of newly acquired skills, which has the potential to increase employability within the justice ecosystem, though success in this regard will depend in part on their integration into qualification systems.

In allowing learners to go abroad and share experiences, the project creates connections between different countries and has the potential to enrich the overall VET system. More specifically, through knowledge exchange, peer learning, and joint curriculum development, benefiting from the expertise of more advanced partners, PROMOTE supports countries with less developed VET systems. For example, the above-mentioned EBSN webinar gathered over 60 European participants, fostering dialogue across sectors. Transnational exchanges as part of the project also allow professionals to gain exposure to good practices from other national systems. In addition, shared digital tools and open-access platforms promoting inclusive access to professional development opportunities. Consortium partners from the project report benefits gained from the collaboration across countries brought by the CoVE. To them, their interactions with counterparts from other countries so far have allowed them to exchange perspectives and knowledge and learn from other countries' approaches to the correctional field.

PROMOTE aligns with the objectives of several EU flagship initiatives by supporting the development of sector-specific skills, digital innovation, and inclusive VET ecosystems. Certain project partners have experience with or are directly engaged in initiatives like the Pact for Skills and Blueprint Alliances in related sectors. These partners bring relevant expertise into PROMOTE, helping to ensure consistency with broader European strategies on skills development. This indirect cooperation strengthens the project's alignment with EU policy frameworks and supports cross-initiative knowledge transfer.

21.4. Success factors

Added value of PROMOTE

According to the project coordinator and partners, PROMOTE has so far brought added value to the participating organisations by enhancing their capacity to work transnationally and preparing them to implement integrated training models tailored to the correctional sector. One of the key successes of the project has been the creation of national CoVE ecosystems that connect VET providers, justice authorities, and civil society. This structured cooperation has facilitated the

development of tailored digital learning modules, which, as reported by the project stakeholders, would not have been possible without the initiative.

PROMOTE also plans to provide benefits for specific stakeholder groups. Learners will gain access to modular, competency-based training aligned with real correctional sector needs, while trainers will benefit from new methodologies and international collaboration. Institutions in the justice sector will be able to offer structured, recognised upskilling pathways for their staff, and companies and NGOs will have access to a better-prepared workforce and increased opportunities to participate in VET design and delivery.

“Through this project, I learned about the numerous players involved in the correctional system. To me, it is a true opportunity to strengthen collaboration within this field.”

Kaunas University of Technology, project partner

The project is supporting the creation of skills ecosystems in partner countries by integrating correctional training into broader regional strategies and promoting collaboration between education, research, and professional practice. As foreseen by the project coordinator, this should strengthen the visibility and policy relevance of training in the justice sector. The international dimension of the PROMOTE project enables mutual learning, transfer of innovative practices, and alignment of training standards across Europe (ESCO descriptors and EQF levels). This will increase the recognition of resulting certificates by the prison services and ministries involved in the project and support the mobility and professional development of learners and trainers within the correctional system.

Additionally, with its goal to establish physical CoVE centres in each partner country, PROMOTE intends to create hubs for collaboration in training including all representatives from the correctional sector and thus, forge a common vision that supports regional development.

Potential for sustainability, scalability and transferability

PROMOTE's financial viability is supported by institutional commitment, integration of training content into national systems, and ongoing cooperation with public authorities (such as engagement with ministries relevant to the project participants' professional sectors including justice, health, social affairs, and interior), according to the CoVE coordinator and partners. The project's alignment with national and EU priorities in justice and vocational education enhances its chances of attracting future funding, particularly at national level.

The outcomes of PROMOTE are designed to be replicable and scalable due to their modular format, digital delivery, alignment with EU competence frameworks, and the skills it seeks to develop. The structured methodology for ecosystem building and stakeholder engagement is transferable across sectors with similar needs, which has the potential to allow other regions and countries to adopt the project's approaches. Such sectors include the social care and the public health (particularly in relation to addiction treatment) as they also support vulnerable adults and would thus benefit from training in similar de-escalation and case-management skills. Additionally, adult-education and employment services would benefit from the project's modular VET and recognition-of-prior-learning tools fit their upskilling models.

Additionally, the project's planned production of a handbook should allow other interested organisations to access guidance on developing CoVEs related to the correctional sector. This will support the transferability of the CoVE's approach and practices beyond PROMOTE's scope.

PROMOTE fosters joint curriculum development by aligning academic expertise with vocational training needs. In the data collection phase of the project, higher education institutions provided theoretical foundations and methodological guidance. These institutions and VET

“The project outcomes will be transferable thanks to the evidence-based approach of the project and its focus on common challenges across the correctional system in Europe. As a result, its training materials and methodologies will be adapted to different national contexts, while maintaining its core principles such as peer education, interprofessional cooperation.”

Lithuanian Prison Service, project partner

providers will later co-author the curricula and pilot delivery with the prison employers to ensure practical relevance. As stated by the CoVE coordinator, this collaboration should result in balanced, practice-oriented learning experiences that support employability and lifelong learning.

Additionally, the project promotes collaboration between training providers and companies (such as private firms, social enterprises, NGOs, and research institutes that deliver training in the prison environment) through joint development of training modules, involvement of employers in validating curricula, and co-organising work-based learning activities. This cooperation is designed to ensure that training is aligned with labour market needs and that learners gain relevant, hands-on experience in professional environments.

21.5. Overall impact and lessons learnt

At it progresses through its implementation plan, PROMOTE plans to have positive effects on vocational excellence in the correctional field by developing tailored training programmes, establishing cross-sectoral partnerships, and implementing skills validation mechanisms. According to the project coordinator, these efforts will contribute to the long-term professionalisation of correctional staff and support individuals in custody to acquire relevant skills, improve employability, and reintegrate into society. PROMOTE plans to allow workers from the correctional field to gain a wider perspective and enrich their skills.

So far, according to the project coordinator and partners, key lessons learned include the importance of collaboration and partnership. Diverse actors working together have already led to effective outcomes in terms of creating paths for exchanges and sharing of experience and expectations, should in the longer run improve alignment between education and labour market needs.

Looking ahead, PROMOTE aims to enhance its impacts by integrating training into national systems, maintaining cooperation networks, and exploring new funding opportunities.

22. SHOREWINNER – Southern European Community for Offshore Wind Energy

22.1. About SHOREWINNER

Background information

- **Project name:** SHOREWINNER – Southern European Community for Offshore Wind Energy
- **Duration:** 2024-2028
- **Call year:** 2023
- **Project status:** Ongoing

The SHOREWINNER project is coordinated by the Polytechnic of Porto (P.PORTO) in Portugal and brings together 28 partner organisations from Portugal, Spain, Italy, Greece, and Cyprus, covering a diverse range of stakeholders, including Vocational Education and Training (VET) institutions, Higher Education (HE) institutions, industry representatives, research centres and government agencies. These partners contribute expertise in offshore wind energy, workforce upskilling, regional economic development, and innovation.

Objectives of the CoVE project

Together, the five SHOREWINNER Centres of Vocational Excellence (CoVE) aim to establish a Community of Practice (CoP) to enhance vocational training in offshore renewable wind energy. The SHOREWINNER project involves:

- A comprehensive analysis of knowledge and skills gaps within the offshore renewable wind sector across participating countries.
- The design and implementation of high-quality VET curricula and training resources based on national contexts.
- The delivery of professional development initiatives, including internships, workshops, seminars, and training programmes for learners and trainers.
- The creation of a CoP to facilitate knowledge exchange, best practices, and resource sharing across all CoVEs.

Through these activities, the SHOREWINNER project promotes objectives and skills aligned with EU policy priorities and frameworks such as the *European Skills Agenda*, *Union of Skills*, *DigComp*, and *GreenComp*. According to interviewees, the project fosters:

- **Technical skills**, including mechanics, electricity, digital system management, and environmental practices, will also be core to SHOREWINNER training, particularly given the multidisciplinary nature of offshore wind operations.
- **Skills for quality jobs and lives**, particularly **soft and interpersonal skills** (e.g. communication, teamwork, problem-solving, resilience and emotional awareness). These were considered vital for working in challenging offshore environments, where adaptability and collaboration are critical. Interviewees noted that evaluating these skills and embedding them into qualifications will be a key challenge but essential to meet employer expectations.
- **Upskilling and reskilling** efforts target adjacent sectors/occupations (e.g. welders, metal workers and maritime operators) whose existing competencies can be adapted to offshore roles. Interviewees emphasised the urgent demand for skilled professionals and discussed how VET and HEI cannot cope with the demand by themselves. Interviewees discussed using microcredentials (or, in the case of Spain, “specialisation courses”) to support the reskilling of workers.

- **Free movement of workers across Europe** by developing **transnational qualifications**, though interviewees flagged language barriers, especially low English proficiency among Spanish VET students, as a potential obstacle.
- **Attracting and retaining talent**, SHOREWINNER fosters engagement through national and international events, the Shorewinner Circle and a digital platform designed to promote visibility, networking, and feedback. This approach guarantees continuous learning into the CoP and supports the stakeholders engagement.
- **Digital and green competencies** are explicitly integrated into SHOREWINNER's approach. The project leverages digital tools such as Virtual Reality (VR) – especially valuable for training in regions like Cyprus with no direct access to offshore plants. While adoption of VR is still in its early stages across the consortium, it is seen as a key innovation, especially for safety training and remote learning.

According to interviewees, SHOREWINNER also aims to support trainer and educator development, including future courses on the use of VR and access to an online platform that will centralise resources, training materials, and sector updates, ensuring educators stay aligned with the latest industry standards.

Through these aligned efforts, SHOREWINNER not only attempts to build a resilient skills ecosystem in the offshore renewable energy sector but also contributes to EU ambitions for inclusive, digital, and sustainable vocational excellence.

22.2. Stakeholders involved and activities covered

Roles of the CoVE coordinator and partners

This section explores the key partnerships involved at the consortium and CoVE level.

The project coordinator played a vital role in strengthening the consortium by appointing country leaders. According to the project proposal, the leaders of the national CoVEs are five higher education institutions, with one representing each member country. This decision was based not only on the coordinator's profile but also on the desire to distribute responsibilities among established organizations. As a result, each CoVE leader became responsible for coordinating partners within their respective countries. This ensured alignment with local needs and provided the flexibility necessary to address different regional requirements. From the coordinator's perspective, this decentralized approach has been pivotal for the project's success.

CoVE leaders established relations with different stakeholders, mainly VET providers and companies that were interested in either: (a) sharing their views on the skill employees in the offshore wind sector need, (b) being involved in designing training specific to offshore wind plants, and (c) offering training placements to potential students.

Activities covered

As mentioned before, each stakeholder group has been assigned different roles and responsibilities:

- **VET providers** play a central role in the *Teaching and Learning* cluster. They are responsible for the design and implementation of VET programmes aligned with industry needs, organising hands-on learning experiences such as internships and workshops, and ensuring continuous engagement with industry actors.
- **HE institutions** support both the *Teaching and Learning* and *Governance and Funding* clusters. Their primary functions include the development of advanced training modules, ensuring academic and pedagogical quality, and contributing research-based content that enhances curriculum relevance and innovation. .
- **SMEs and industry experts** contribute primarily to the *Cooperation and Partnerships* cluster. They provide essential input into the identification of skills needs, co-create training materials, and offer real-world experiences such as site visits and industry case

studies. This ensures that the learning pathways remain relevant to labor market demands and evolving sector needs.

- **Research centres** feed into both the *Teaching and Learning* and *Cooperation and Partnerships* clusters by incorporating up-to-date scientific knowledge and technological advances into the training content. Their involvement guarantees that learners gain insights aligned with the forefront of offshore renewable energy research and development.
- **Associated partners** – such as regional authorities and education stakeholders – play a supportive role across all three clusters. They assist in piloting training approaches, share regional expertise, and promote the dissemination of innovative practices in VET.
- **The coordinator**, P.PORTO, leads the *Governance and Funding* cluster by ensuring the overall management, coherence, and quality of project activities. The coordinator is responsible for steering collaboration among partners, monitoring deliverables, and overseeing project reporting and sustainability planning.

Wider engagement in CoVE activities

The formation of partnerships within the SHOREWINNER project varied significantly between national and international levels. Interviewees consistently noted that national partnerships were generally easier to establish. This was largely due to existing working relationships and a shared understanding of institutional roles and expectations. An exception was Cyprus, where the early-stage development of the offshore sector, limited sector maturity, and political constraints made national collaboration more time-intensive and trust-dependent.

At the international level, two main challenges were identified: cultural and language differences – given that English was the working language – and the absence of prior collaboration, which required greater trust to be developed and clearer expectations. Despite these hurdles, the international partnership was described as “rewarding,” “smooth,” and “necessary and beneficial”. Interviewees emphasised that collaboration improved once the consortium was established, and partners became familiar with one another. Regular interactions, facilitated by consortium meetings held every 2 to 4 weeks, further enhanced trust and cooperation. Furthermore, the project coordinator noted that the transfer of funds to the consortium leads increased trust among partners, thereby promoting better collaboration.

Across all participating countries, HE institutions were required to collaborate with vocational education and training VET providers. This collaboration allowed HE and VET providers to become more familiar with their structures and methods. Interviewees highlighted that VET centres maintain close ties with industry, while HE institutions are often more theoretical and research oriented. This collaboration enabled HE to support VET with academic rigor while remaining aligned with labour market needs. It also ensured coverage across the full spectrum of skill levels required in the offshore sector, with VET focusing on EQF levels 4–5 and HE on levels 6–8. Offshore plants require technical expertise, higher-level technicians, and engineers educated to degree level; hence, this cooperation is needed to address all levels of skill needs. Additionally, this VET-HE collaboration broadens opportunities for students to transition into higher education once they complete their VET. Lastly, an interviewee also pointed out that VET students frequently provide feedback to their providers based on their experiences, which is highly beneficial for designing or improving courses.

22.3. Results expected and achieved

Contribution to the development of qualifications

This section outlines the progress made in curriculum development within the SHOREWINNER project, as well as the planned steps toward formal qualification. It reflects the consortium’s strategic approach to aligning training with sector needs while navigating the complexities of national and transnational education systems.

State of play

At the time of the interviews, the SHOREWINNER project had been active for 14 months. Several interviewees confirmed that all objectives outlined in the technical description had been met to date. A key milestone was the completion of surveys and interviews to identify skill gaps in the offshore wind energy sector across five countries. This research involved approximately 127 teachers, over 386 students, and 125 professionals, along with around 60 short interviews. The findings provided a shared foundation for defining the competencies to be reflected in the curriculum.

Next steps

Interviewees noted that the consortium deliberately prioritised curriculum development before addressing its formal recognition, given the complexity of qualification processes. Nonetheless, there was a view that it was important to involve employers and national certification bodies early in the process, along with key industry stakeholders, to ensure that the qualifications did not only meet practical needs but also, quality standards. According to interviewees, over the next year, the consortium plans to design and pilot a transnational joint curriculum at EQF level 5, while each CoVE will adapt four to six existing national curricula across EQF levels 3 to 7.

Future plan to obtain official qualifications

The ultimate goal is for students to receive formal credentials for the skills acquired through these courses. While some interviewees believed this could be achieved before the end of the Erasmus+ funding period, others anticipated that the process might extend beyond it.

Interviewees agreed that achieving formal national-level qualification recognition is more feasible than transnational alignment, due to the diversity of national systems. Several suggested that micro-credentials could offer a practical route for transnational recognition, though implementation details remain to be defined. At the national level, adapting existing course specifications was seen as a relatively straightforward process, with time rather than complexity being the main constraint. However, the type of institution – public or private – may influence the recognition process for courses in both HE and VET contexts.

Contribution to enhancing the quality and attractiveness of VET

Interviewees indicated that the SHOREWINNER project is currently in its early stages, and there is no explicit objective to enhance the appeal of VET. However, some interviewees noted that in Southern Europe, VET education is perceived as a "fall-back" option compared to HE. They suggested that the SHOREWINNER project has the potential to increase the credibility of VET schools by providing students with skills that are in increasing demand in an innovative sector. Indeed, some interviewees argued that SHOREWINNER students will acquire unique competencies that are not currently offered at universities. Furthermore, interviewees reported that the SHOREWINNER project has enabled VET stakeholders in Greece to improve by learning from partners in Portugal and Spain (e.g. designing more modular and labour market-responsive curriculum). Lastly, interviewees considered that the aspect of mobility could enhance the attractiveness of their VET courses, as students would have the potential to be able to utilise their qualifications transnationally.

22.4. Success factors

Added value of SHOREWINNER

This section explores the SHOREWINNER project's added value, focusing on its contributions to fostering collaboration, enhancing education and industry connections, and building a sustainable skills ecosystem. It also examines the tangible benefits experienced by various stakeholders.

According to interviewees, the SHOREWINNER project addresses the three pillars of the "knowledge triangle" (i.e. education, research, and innovation) and their interactions. The

SHOREWINNER project aims to provide high-quality transnational training programmes, strengthening the skill sets and employability of students, thereby fostering the development of the offshore wind energy sector. This initiative not only drives innovation within the sector but also promotes educational advancements by incorporating elements like VR and other simulators into VET and HE courses to reduce costs and risks during training. Although the SHOREWINNER project primarily focuses on the education and innovation aspects of the knowledge triangle, both have partly been derived from research carried out with different stakeholders to understand the skill gaps in the labour market.

As a byproduct of the "knowledge triangle" the SHOREWINNER project is in the early stages of creating a skills ecosystem with the following characteristics:

- Collaboration between VET, higher education, industry, and public sector.
- Responsive curricula based on labour market and innovation needs.
- Ongoing upskilling and reskilling of the workforce to retain talent.
- Alignment with regional economic developments (i.e. offshore platforms and local ports).
- Shared responsibility at the transnational and national level for workforce development.

The skills ecosystem is bringing different benefits to each stakeholder group:

- **Leaders of each CoVE project/ HE Providers:** Each of the five CoVEs from SHOREWINNER is broadening the network of its leaders by engaging with new companies, universities, and VET organisations within the sector. This is beneficial as it promotes potential future collaborations beyond this project. Additionally, the collaborative efforts facilitated by the consortium is contributing to the advancement of countries with less developed offshore industries, such as Greece and Cyprus.
- **VET providers:** VET trainers have expressed concern regarding their ability to adapt to industry changes. Hence, they see the SHOREWINNER project as a great opportunity for them.
- **Collaboration between VET and HE:** According to interviewees, HE focuses on "academic outcomes and research", while VET emphasises "practical skills". The target groups are different, and their roles complement each other.
- **Teachers and Trainers:** Teachers and trainers will have opportunities to enhance their knowledge and teaching methods through upskilling programmes, including the use of new technologies such as virtual reality.
- **Students:** On the one hand, according to interviewees, students appreciated being consulted on the new curriculum and were very keen to share their opinions. On the other hand, the SHOREWINNER project is meant to give them specialised, industry-level knowledge, improving access to high-quality training and helping them secure jobs more quickly by connecting with companies early in their training. This is particularly important in areas where the offshore wind sector is not as developed like in Cyprus, as it will allow its students to travel abroad to be trained while having the potential to get a qualification recognised in their home country.
- **Companies:** According to interviewees, numerous companies within the wind industry want to expand into the offshore renewable sector. The SHOREWINNER project enables them to identify skills gaps. Additionally, several organisations have expressed interest in contributing to the SHOREWINNER curriculum and have even offered their facilities for training. By doing this, businesses can ensure their access to a skilled workforce, enhancing the talent pipeline.

Potential for sustainability, scalability and transferability

Interviewees expressed a range of perspectives regarding the sustainability of the SHOREWINNER project beyond the Erasmus+ funding period. While all agreed that some form

of continued funding – whether regional or transnational – would be necessary, their views diverged on the extent and nature of this requirement.

One perspective emphasised the resilience of the CoP, suggesting that it could continue or even thrive without direct funding due to the mutual benefits derived by all partners involved. In contrast, another perspective highlighted that the project as a whole would not be sustainable without ongoing financial support. This view acknowledged that while certain elements at the national level might continue through regional funding and institutional commitment, the operational functionality of the CoP would require alternative funding mechanisms. Moreover, at the national level, sustainability is reliant on active engagement by a community of teachers and national stakeholders, who must perceive tangible benefits to remain involved. Transnationally, the resource-intensive nature of stakeholder engagement, the need for continuous curriculum updates, and the costs associated with aligning and translating materials were cited as key barriers to sustainability without dedicated funding.

A third perspective focused on the potential for sustainability at the regional level through integration into official VET or HE curricula, supported by public education funds. Additionally, a joint funding model could be necessary in some contexts, potentially involving contributions from the public sector and companies. For example, in Italy, “interprofessional funds” allow companies to redirect a portion of their tax obligations – approximately 0.3% of employee salaries – into training initiatives. These funds can be used to finance courses delivered by accredited VET centres, offering a sustainable model where students gain valuable skills and companies benefit from shaping curricula, selecting candidates, and pre-employing apprentices.

The project coordinator argued that the SHOREWINNER project was replicable, scalable and transferable:

- In terms of replicability, its CoP model and standardised curricula are well-positioned to be mirrored in other countries with similar offshore energy ambitions. The modular nature of the training resources would further support customisation to local needs.
- The scalability of the SHOREWINNER is possible because the cross-border collaboration structure established among the five national CoVEs facilitates the expansion of the CoP.
- The project has strong transferability because its emphasis on offshore transversal skills ensures relevance across adjacent sectors such as tidal and wave energy. Moreover, the focus on stakeholder engagement enhances adaptability to varying regulatory and industrial contexts.

According to interviewees, the key challenges to long-term success include the need for ongoing industry partnerships and consistent policy support. The latter seems to have been particularly relevant in some countries where interviewees argued that regional governments have not been particularly supportive of the offshore wind sector. In this sense, students in countries where the offshore wind sector is less developed, will be particularly dependent on mobility opportunities during their training

22.5. Overall impact and lessons learnt

All interviewees agreed that, thus far, a key achievement of the SHOREWINNER project has been the establishment of a collaborative ecosystem at the national and transnational level that, for the first time, helps to bridge the gaps between education providers, policymakers, local authorities, and industry stakeholders. This integrated approach has created a shared understanding and alignment of objectives across stakeholders.

Another major accomplishment cited by several interviewees is the enhanced understanding of the offshore renewable energy sector’s needs. This insight, gained through a range of research activities, has laid a solid foundation with the potential for the development of a responsive and relevant curriculum. Additionally, the growing interest from companies in more industry-oriented

training was noted as a positive signal, with some suggesting that the project may be contributing to increased momentum in offshore industry development.

Looking ahead, interviewees identified several long-term impacts expected to emerge once the project concludes. The development of a translational curriculum and a robust community of practice were widely regarded as enduring contributions that have the potential to continue to shape the sector in the countries concerned in the coming years.

The online platform was also highlighted as a significant short-term asset. Designed to connect educators and learners across borders, it should offer flexibility through English-language delivery and modular content. This structure will enable countries to adapt training materials to their specific needs while also supporting student mobility and international engagement.

Another anticipated outcome is the demonstration of success stories that address systemic challenges such as talent retention, student enrolment, and regional economic development, which have potential to serve as evidence of the project's value and impact.

According to some interviewees, the SHOREWINNER project ultimately aspires to contribute to the creation of a skilled offshore workforce capable of supporting the European Union's Net Zero objectives and driving innovation in offshore energy technologies.

23. Talentjourney

23.1. About Talentjourney

Background information

- **Project name:** Talentjourney
- **Duration:** 2019-2021
- **Call year:** 2019
- **Project status:** Completed

Talentjourney was a pilot CoVE project led and coordinated by the School Centre of Nova Gorica (SCNG) in Slovenia.

It involved thirteen consortium partners across six countries: Italy, Germany, Finland, Estonia and Slovenia. The partners involved VET schools and University of applied sciences, companies, research institutes and a National Institute for VET (in Slovenia).

Objectives of the CoVE project

The Talentjourney project aimed to narrow the skills gap in the manufacturing sector, specifically in the field of IoT (Internet of Things) in smart manufacturing, by focusing on user-oriented, user-friendly, and eco-friendly solutions. Talentjourney was one of the pioneering CoVEs in 2019, serving as a pilot project. Talentjourney aimed to create a completely new educational paradigm and environment: an open and innovative space, networking, and sharing ecosystem allowing learners to discover their potential, develop it to knowledge excellence, professionalism, and personal satisfaction.

23.2. Activities of Talentjourney and skills developed

Activities covered

Talentjourney established a transnational CoVE ecosystem with partners from Slovenia, Finland, Estonia, and Italy, underpinned by:

- Common curricula and modular training content, especially in smart manufacturing and IoT, covering also the following related areas: AI, cybersecurity, data science, robotics, production process development, AR/VR
- Shared development of Demo Labs, enabling practical, aligned training infrastructures.
- Engagement with international networks (e.g., ETF, UNESCO-UNEVOC) for peer learning and policy dialogue.

The activities covered under the Talentjourney CoVE project can be summarised as follows:

- **Teaching and Learning (Cluster 1):** The Talentjourney project involved the development of curricula in the field of IoT in smart manufacturing, covering topics such as AI, cybersecurity, data science, robotics, production process development, and augmented reality / virtual reality (AR/VR), alongside the establishment of Demo Labs. Demo Labs are hands-on learning spaces where students co-create solutions to real-world challenges using advanced technologies, fostering innovation, industry collaboration, and practical skills through challenge-based and interdisciplinary learning. Business experts supported teachers in developing the necessary skills and, in designing the implementation of these skills, emphasised problem-based learning and hackathon-style approaches, identified by industry as the most relevant and effective methods. To prepare teachers for delivering the new curricula, tailored training programmes were developed, and teachers participated in these training sessions.

- **Cooperation and Partnerships (Cluster 2):** The Talentjourney project involved mapping regional and European stakeholders, including VET schools, companies, national institutes, associations of employers, and public authorities. This mapping aimed to understand their roles and support the project's objectives. Collaboration with industry experts in fields such as AI, cybersecurity, and data science was crucial, as they provided insights into labour market skills and helped develop relevant curricula and training programmes. The project also engaged with public authorities to integrate vocational excellence into the national VET system, facing challenges such as differing opinions on feasibility.
- **Governance and Funding (Cluster 3):** The Talentjourney project entailed the preparation of letters of intent and memorandums of understanding (MoUs) with various stakeholders to formalise commitments and contributions, outlining roles such as providing professional training for teachers, offering work-based learning opportunities for students and other areas of both-side beneficial collaboration. Stakeholders specified their contributions at national or international levels, creating a diverse network of committed partners. Funding options included Erasmus Mobility programmes, which supported transnational learning experiences but had limitations in sustaining larger-scale activities.

The overall partnership development approach under the Talentjourney project was to build broad, innovation-driven networks that included VET schools, companies, national institutes, research organisations, chambers, and employer associations.

Nevertheless, the approach to partnership building in the Talentjourney project varied across the regional CoVEs, with each region customising its strategy according to local ecosystem characteristics and priorities. Each regional CoVE used a tailored strategy for partnership development, based on existing institutional capacity, governance structures, and local labour market dynamics. Most VET providers involved in the Talentjourney CoVEs already had their own networks of employers. Networks were expanded as the need was to look for industry experts in specific fields such as AI and cybersecurity¹⁴⁷. For instance:

- **Slovenia** established a network by integrating regional VET providers, private initiatives, foundations and research departments from the companies (due to the need of developing skills from the emerging areas of the TJ). It distinguished between tutors (school-based educators) and mentors (industry-based trainers) to connect learners to the workforce. Key stakeholders included those involved in Demo Labs, smart specialisation chains, alumni clubs, and crowdfunding foundations. The approach emphasised the roles of family, friends, and international exchange, reflecting a deeply contextualized and inclusive partnership-building strategy.
- **Finland** focused on regional cooperation and included trade unions, foundations and University of applied sciences as key players, due to the need of developing skills from the emerging areas of Talentjourney. The partnership building leaned on strong municipal and regional development agencies and emphasised bilateral ties between teachers and companies. Foundations also supported education funding, and early home visits by VET staff to students' families highlighted strong community integration, according to the Finnish partner and project coordinator.
- **Italy** had a multi-level governance model, where many decisions were made at the regional level. This CoVE's ecosystem included Fondazione ITS (technical institutes) and business support organizations (BSOs) as prominent stakeholders. Tutors in Italy played a bridging role between learners, companies, and VET providers, and were considered essential for aligning training content with labour market needs.
- **Estonia** took a nationally oriented approach, where most stakeholders (e.g., VET providers and universities) acted at the national level. The Estonian Talentjourney

¹⁴⁷ Talentjourney Regional Ecosystems: <https://talentjourney.scv.si/wp-content/uploads/2022/02/Wp5.2.1-Regional-ecosystem-maps.pdf>

CoVE integrated sectoral associations and large industrial players but the consortium partner noted that formal cooperation between VET and universities could be stronger due to the need of developing skills from the emerging areas of Talentjourney.

Associations, ministries, and research centres formed the backbone of Talentjourney's stakeholder engagement. Start-ups represented a valuable yet often underutilised part of the Talentjourney ecosystems, according to the project coordinator. While their agility and innovation potential were recognised, many faced challenges in accessing hardware-related funding and long-term partnerships. Strengthening support mechanisms for start-ups, particularly those working in emerging fields like AI, IoT, and cybersecurity, could enhance the overall innovation capacity of CoVEs and bridge gaps between education, technology, and entrepreneurship.

Skills developed

The Talentjourney project supported the green and digital transitions in VET, focusing on IoT in smart manufacturing. It developed a range of professional and technical training modules

Curricula were developed based on labour market intelligence and foresight studies, ensuring alignment with evolving industry needs. Talentjourney produced 48 training modules, all incorporating transversal, digital, and green skills, promoting eco-efficient production, energy monitoring, digital collaboration, cybersecurity, and responsible resource use in industrial environments.

The training modules on digital skills were multiple and covered:

- Information and data literacy (e.g., interpreting data from IoT sensors).
- Digital communication and collaboration (e.g., using cloud platforms for team-based tasks).
- Digital content creation (e.g., configuring IoT dashboards or creating system documentation).
- Problem-solving and cybersecurity awareness, especially in the context of smart factory environments.
- AI awareness and application (e.g., understanding basic AI concepts and how AI supports predictive maintenance or automation).
- Digital safety and ethical awareness (e.g., understanding data privacy, responsible AI use, and ethical implications of connected technologies)

The training modules on green skills reflected Talentjourney's commitment to sustainability and environmental responsibility in smart manufacturing. Learning pathways embed competencies such as:

- Systems and critical thinking to assess the environmental impact of industrial processes.
- Promoting sustainable behaviour through the selection of environmentally friendly materials and energy-saving solutions.
- Responsibility and agency, encouraging learners to propose greener process alternatives during their project work.

Talentjourney emphasised **innovative, learner-centred teaching methods**, particularly problem-based learning, hackathons, and challenge-based models. These involve real-world industry challenges, encouraging critical thinking, creativity, and teamwork. Hackathons were a core strategy where students, mentored by teachers and industry professionals, rapidly prototype solutions. The Design Thinking methodology underpins the pedagogical approach, promoting ideation, and prototyping to foster user-centric learning. These methods are tested in joint modules and mobility programmes, such as the virtual reality course co-developed with Finnish partners.

IoT Demo Labs were central to Talentjourney's model. These interdisciplinary spaces simulate smart manufacturing environments, enabling hands-on experimentation with sensors, industrial automation, predictive maintenance, and cybersecurity. The labs also function as co-working and prototyping hubs where students, teachers, and industry experts collaborate. These labs are integrated into both curricula and extracurricular activities and are used for Erasmus+ mobility exchanges, as well.

Talentjourney had a strong focus on **transversal skills and STEM education**, equipping learners with communication, problem-solving, teamwork, entrepreneurial mindset, and data analysis skills. In science and engineering, students gained insights into materials, electronics, mechatronics, and process optimisation, while mathematics was applied through modelling and precision measurement.

The project integrated **emerging technologies like AI, AR/VR**, and digital platforms both as training content and pedagogical tools. Learners explored AI applications in predictive maintenance and quality control, cybersecurity protocols for connected systems, and VR/AR for immersive simulations and guided machine maintenance.

Professional development was a key component, with targeted **“train the trainer” programmes** upskilling teachers in both digital tools and pedagogical strategies. Trainers engaged in peer learning, design workshops, and co-creation of learning materials with industry and academic experts. In some cases, experienced students trained peers, helping to create more sustainable skill ecosystems.

The Talentjourney project placed greater emphasis on curricular content rather than formal qualifications, according to the consortium partners. Several training modules were incorporated into programmes at EQF levels 4 and 5, and joint modules were co-developed with international partners, each addressing specific areas of expertise. For example, one of the Slovenian regional CoVEs collaborated with its Finnish and Italian counterpart to develop a Robotics course, using a problem-based learning approach. Another Slovenian regional CoVE collaborated with the Estonian CoVE to develop joint modules in AI and cybersecurity.

Although the project did not include formal apprenticeships, it featured work-based learning activities integrated within the curriculum. Additionally, Demo Lab activities, which offer hands-on experience with emerging technologies, have occasionally been organised as extracurricular learning opportunities.

23.3. Results achieved

Contribution to the development of qualifications

According to the project coordinator, the Talentjourney project has established a strong foundation for inclusive and lifelong learning pathways by developing flexible, modular, and competence-based training aligned with the evolving demands of smart manufacturing and Industrial IoT. These pathways are tailored for adult learners, unemployed individuals, in-company trainers, and teachers, with training offered through micro-credentials and short, certification-based programmes in areas such as AI, cybersecurity, robotics, data science, augmented/virtual reality (AR/VR), and green skills.

Talentjourney created **modular, learner-centred curricula for both IVET and lifelong learning, aligned with Industry 4.0**. These curricula were co-created by international teams from Slovenia, Estonia, Finland, and Italy, involving teachers, industry professionals, and researchers. At the national level, partner institutions integrated modules into their programmes with varying scope, reflecting differences in curricular autonomy. For example, SCNG (the lead organisation) incorporated cybersecurity and AI modules into its open curriculum at EQF Level 4, and elements of Talentjourney content were integrated into higher vocational programmes (EQF Level 5). Similarly, a partner in the Slovenian CoVE introduced a Production Process Development module into several technician programmes, while the Finnish consortium partner, Sataedu, incorporated robotics-related content into its three- and four-year programmes.

At the heart of Talentjourney is a user-centred, co-creation approach, guided by a skills needs analysis that involved 41 companies across partner countries. This collaborative process guided the development of modular curricula at EQF levels 4 and 5, with a strong focus on Industry 4.0 and Industrial IoT competencies with related areas (AI, cyber security, data science, robotics, AR/VR, process production development). The modules were designed jointly by VET providers, industry partners, and technology experts, ensuring alignment with national frameworks and adaptability to regional labour market needs. While the project did not lead to full joint qualifications, it successfully piloted flexible, competence-based learning units that can be integrated into national systems, into the part of curricula that every VET provider partner can design by itself (respecting the local needs) or offered as standalone upskilling and reskilling programmes. The piloting of the training modules completed in 2021. However, the Talentjourney project partners continue to update and get feedback of the modules and competences that have been integrated into VET curricula.

Talentjourney emphasised transnational learning and mobility, supported by a **shared framework for competences, learning outcomes, and validation mechanisms** (EQF, ECVET, ESCO). The EQF, ESCO, and ECVET frameworks provided a common reference for ensuring qualification recognition and supporting curriculum interoperability across different regions and partner countries.

Joint modules were piloted through various parts of curricula (such as open curricula, work-based learning), as well as mobility programmes like Erasmus+, using the Talentjourney “annual clock” to align academic calendars across borders. Learners participated in hybrid, challenge-based activities, including Demo Labs and VR simulations, fostering interdisciplinary, experiential, and intercultural learning.

Talentjourney also promoted the cross-border recognition of skills by developing micro-credentials that certify specific, assessed learning outcomes. These were formalized through certificates issued by VET institutions, in close collaboration with industry partners and institutions such as the Slovenian Institute for Vocational Education and Training (CPI). The micro-credentials served as flexible and modular proofs of competence, recognised by participating schools and designed to reflect real-world skill needs. Around 30% of the curriculum was intentionally left open for regional adaptation, enabling each institution to integrate locally relevant content and to award micro-credentials accordingly. While these certifications do not replace full qualifications, they are highly valued by employers as they are tailored to emerging labour market demands and support a more agile and learner-centred approach to vocational training.

Talentjourney’s methods align closely with the European University Initiative through its focus on joint curricula, mobility, and interoperability, laying the groundwork for sustainable cross-border cooperation in VET.

Contribution to enhancing the quality and attractiveness of VET

Talentjourney sought to transform the approach to VET provision by adopting a more holistic perspective in response to evolving challenges in the labour market, society, and the environment by bringing together collaborative innovation, international engagement, and institutional development.

A distinctive feature of the Talentjourney CoVE is the Demo Labs, which enhance the quality and attractiveness of VET by serving as interdisciplinary spaces for prototyping, testing, and applying innovative, problem-based approaches. Developed in collaboration with industry and research institutions, they promote collaboration among students, teachers, and experts while remaining closely aligned with labour market needs. In addition to supporting “train-the-trainer” activities and peer-to-peer learning, Demo Labs facilitate Erasmus+ mobility and international cooperation across Talentjourney CoVEs in Slovenia, Finland, Italy, and Estonia.

To further strengthen VET excellence, Talentjourney implemented a structured approach to data collection and monitoring to ensure continuous improvement and alignment with industry needs. This included:

- Conducting annual interviews and surveys with companies to identify emerging skills demands in smart manufacturing.
- Using digital tools to collect and analyse feedback from Design Thinking workshops and curriculum pilots.
- Establishing key performance indicators (KPIs) to monitor learner outcomes and the effectiveness of curricular innovations.

KPIs were central to monitoring whether the transnational joint curricula met its learning outcomes, fostered employability and skills matching, enhanced learner mobility and collaboration.

Measuring the progress/ impact of vocational excellence or monitoring KPIs

In addition to monitoring transnational activities, the Talentjourney CoVE partners are committed to evaluating the broader impact of vocational excellence initiatives, including Talentjourney, on the lead organisation (SCNG), its learners, and its wider ecosystem. To support this, the Talentjourney lead organisation collaborated with the European Training Foundation (ETF) to pilot the International Self-Assessment Tool for Centres of Vocational Excellence (ISATCOVE).

Through the ISATCOVE self-assessment process, SCNG engaged a range of stakeholders, collected evidence, and reflected on its practices. As a result, SCNG was awarded the Certificate of Excellence in the field of partnership and collaboration. ISATCOVE not only validated the CoVE's achievements under Talentjourney but also provided a structured framework to monitor and guide its ongoing development in vocational excellence. This process is key to supporting the organisation's future growth and its commitment to delivering high-quality, responsive, and innovative VET provision.

The CoVE also aims to encourage and support other Talentjourney partners to undertake the ISATCOVE self-assessment, strengthening a shared culture of continuous improvement.

This structured approach to data monitoring strengthened the adaptability of VET systems to evolving labour market demands, fostered innovation, and enabled evidence-based curriculum development. It also supported the creation of modular, flexible learning pathways and micro-credentials, while promoting international cooperation and consistent quality standards across VET institutions. In essence, Talentjourney's sustainable data collection and KPI/ISATCOVE monitoring framework demonstrates how VET excellence can be systematically achieved and sustained through informed decision-making, collaborative engagement, and ongoing improvement¹⁴⁸.

23.4. Success factors

Added value of Talentjourney

Talentjourney's added value lies in helping to build robust skills ecosystems that foster collaboration among VET institutions, companies, higher education, and public authorities to better align VET with the evolving needs of the labour market, especially in areas like IoT in smart manufacturing with related areas. From the project coordinator's perspective, this ecosystem approach has strengthened the connection between training and labour market demands while enhancing the competences of both learners and trainers in digital, green, and sector-specific fields/related areas such as AI, robotics, cybersecurity, data science, and VR/AR production processes. By reinforcing the education-research-innovation triangle, Talentjourney

¹⁴⁸ Talentjourney deliverable: 'Sustainability of data collection'. <https://talentjourney.scv.si/wp-content/uploads/2022/02/Wp2.2-Sustainability-data-collection-methodology-DRAFT.pdf>

has accelerated knowledge transfer and ensured training provision is closely aligned with regional and European labour market needs, according to the project coordinator. From the Talentjourney consortium partners' experience, the project has shown that VET can become more attractive, relevant, and future-oriented, both locally and across Europe through strong partnerships, innovative methodologies, and a user-centred design-thinking approach.

A success factor of Talentjourney was its co-creation model, where learners, teachers, and companies collaboratively designed curricula, Demo Labs, and learning experiences. The use of challenge-based learning and problem-solving methods made training more engaging and aligned with real-world needs. The project began with research into skills demand in IoT in smart manufacturing, followed by the development of transnational curricula, professional development structures for VET staff and trainers, and lifelong learning programmes. These were piloted through virtual masterclasses, hands-on IoT and related areas Demo Labs in four countries, and international collaboration.

Talentjourney also led to the creation of a digital Platform for IoT VET Excellence, supported by designing personas, developing user journeys and service blueprints. A Memorandum of Understanding solidified ongoing cooperation between partners, ensuring long-term sustainability.

Talentjourney aligns closely with key EU strategies to build a sustainable, digital, and skilled Europe, translating policy into practical action within VET to develop a green, digital, and future-ready workforce.

- **European Green Deal:** Promotes sustainability by integrating green skills, eco-friendly projects, and energy-efficient processes into VET, preparing learners for the green economy.
- **EU Digital Strategy:** Emphasises advanced digital skills, including IoT, AI, robotics, cybersecurity, data science, VR/AR through hands-on training with modern technologies in Demo Labs.
- **Communication on Attracting Skills and Talent:** Enhances VET's appeal by connecting learners with industry experts internationally and offering real-world challenges, attracting talent across Europe.
- **Industrial and SME Strategies:** Engages SMEs directly in curriculum design, training, and mentoring to ensure VET meets actual industry needs, boosting innovation and workforce retention.

Talentjourney's alignment with the Union of Skills is reflected in several key areas. It supports the twin (green and digital) transitions while coordinating regional skills ecosystems that closely align with industry needs. It drives innovation in teaching and learning, including tailored user journeys for educators, and fosters international collaboration to ensure cross-border recognition of skills. The Talentjourney CoVEs develop transnational curricula to enhance skills portability across the EU, provide targeted training and micro-credentials addressing evolving labour market and societal demands, connect with global experts to maintain cutting-edge educational standards, and attract skilled workers through international partnerships. This alignment manifests across Talentjourney's main pillars, mirroring the Union of Skills' objectives by promoting European-level cooperation with harmonized learning goals beyond national borders; supporting structured skill development for emerging green and digital technologies; enabling inclusive lifelong learning accessible to diverse learners; building strong partnerships and coordinated governance to ensure demand-driven, cross-sectoral skills development; and facilitating the cross-border recognition and portability of skills and qualifications.

Potential for sustainability, scalability and transferability

Talentjourney's modular, learner-centred, and industry-driven approach makes it highly adaptable and replicable across diverse VET systems and regional contexts, according to the project coordinator. Its core components (i.e., modular curricula, IoT demo labs, challenge-based learning, and micro-credentials) are particularly well suited to regions undergoing digital

and green transitions. These elements are supported by an open-access platform, allowing for easy adoption and customisation in different sectors, countries, and education levels.

At the heart of Talentjourney's success is its ecosystem model, which brings together VET schools, universities, employers, and public authorities to modernise vocational education in line with labour market needs. This collaborative framework is reinforced by layered partnership models, including Memoranda of Understanding with strategic stakeholders and active co-creation with industry representatives. These structures ensure both stakeholder buy-in and long-term sustainability.

The project has demonstrated strong scalability and transferability according to pilot feedback from participating institutions, successful uptake of Talentjourney deliverables (modularised curricula, life-long trainings, teacher trainings etc.) and follow-up initiatives such as Munera 3, Challenger, Digistainable teacher, which build directly on its content, approach and methodology. Its methods and materials have already been reused in other sectors and by institutions in less advanced regions aiming to strengthen their VET systems. Training resources are freely available online (<https://talentjourney.scv.si>), supporting continued uptake beyond the original consortium. Through the training of delegates from other EU Member States, Talentjourney is extending its reach and contributing to systemic reform.

Šolski Centre Nova Gorica (ŠCNG), the coordinating institution of the Talentjourney CoVE, was formally recognised as a UNESCO-UNEVOC Centre following a rigorous application process supported by the Slovenian National Commission for UNESCO within the Ministry of higher education, science and innovation. This milestone confirms ŠCNG's leadership in VET innovation. Other Talentjourney CoVEs, such as Sataedu in Finland, are now pursuing similar recognition, though UNEVOC membership is reserved for individual institutions. This experience underscores a key insight: within CoVEs, institutions with a strong strategic vision and commitment to innovation play a critical role in driving transformation of vocational education towards more agile, future-oriented and learner-centred models, while others risk remaining tied to traditional, supply-driven approaches – a divergence that was noted through comparative analysis of ecosystem strategies and piloting outcomes across Talentjourney partner regions.

The project's impact is also evident in its integration into other national lifelong learning activities. In Slovenia, Talentjourney laid the groundwork for the ESF-funded Munera 3 and upcoming life-long learning projects, which aim to offer micro-credentialed training programmes to all interested in the Slovenian labour market. These initiatives, increasingly focused on areas like artificial intelligence, cybersecurity etc. respond directly to evolving industry demands.

Post-project, the CoVE continued partnerships with key institutions like Sataedu and Slovenian VET centres. Despite challenges, such as staff turnover and unsuccessful funding applications with partners in Estonia and Italy, collaboration has persisted. The CoVE identified essential conditions for sustained cooperation: committed personnel and aligned institutional priorities. While some Talentjourney partnerships (e.g. with ITI Malignani) did not continue due to contextual barriers, efforts to engage new partners like ENAIP FVG reflect ongoing commitment to cross-border collaboration in vocational excellence.

Overall, Talentjourney exemplifies the principles of the Union of Skills strategy by promoting shared resources, scalable and flexible models, and systemic reform tools.

23.5. Overall impact and lessons learnt

Talentjourney's long-term impact lies in the systemic and cultural transformation it initiated within VET. Beyond the duration of its Erasmus+ funding, the project fostered a shift toward more learner-centred, flexible, and innovation-driven VET. It introduced new pedagogical methodologies, combining principles of design thinking and service design, and promoted challenge-based learning as a means of addressing real-world problems. At the same time, it strengthened collaboration between VET providers, higher education institutions, and industry. These practices are increasingly embedded in institutional strategies, helping to shape a modern, shared vision of vocational excellence.

Overall, the success of partnerships and ecosystems building in the Talentjourney project can be attributed to the alignment of educational outcomes with industry needs, the creation of a network of schools across Europe, the integration of industry standards into the curriculum, and the provision of resources that allowed for the amplification of activities.

From the project coordinator's perspective, a major driver of Talentjourney's success was also its international cooperation. By connecting partners from Slovenia, Finland, Estonia, Italy, and Germany, the project co-created transnational modular curricula and piloted IoT and related areas demo labs, tailored to both national contexts and European labour market needs. This collaboration accelerated the development of joint training solutions in areas such as AI, cybersecurity, data science, etc. benefiting both initial and continuing VET.

Learners and teachers directly benefited from in-person, online and mobility opportunities, access to cutting-edge learning environments, and participation in international hackathons, which enhanced their technical, transversal, and intercultural skills. These experiences contributed to the development of a broader European VET identity and positioned VET as a key driver of the green and digital transitions.

Given Talentjourney's focus on emerging technology areas, such as IoT, AI, and cybersecurity, VET providers faced initial challenges in finding sufficiently specialised industry experts within the EU. As a result, the project established a transnational network of business and technology experts that extended beyond Europe. This global engagement not only enriched the learning offer but also enabled the transfer of valuable insights and international good practices back into regional ecosystems. In doing so, Talentjourney strengthened the capacity of VET systems to address local challenges through globally informed solutions.

To summarise the perspective of the lead and consortium partners, Talentjourney's most enduring legacy is its transnational ecosystem model for VET excellence, rooted in data, co-creation, and design thinking. It has redefined how curricula are developed and maintained, providing a replicable blueprint for building future-ready VET systems. To ensure lasting impact, CoVEs should be fully integrated into national VET systems, securing sustainability beyond the lifespan of individual projects.

24. TOUR-X – CoVEs for the Tourism Industry

24.1. About TOUR-X

Background information

- **Project name:** TOUR-X - CoVEs for the Tourism Industry
- **Duration:** 2022-2026
- **Call year:** 2021
- **Project status:** Ongoing

Tour-X is a Centre of Vocational Excellence led and coordinated by AKMI ANONIMI EKPAIDEFTIKI ETAIRIA, Greece. The project involves 23 partners from seven countries (Greece, Germany, Spain, Italy, Belgium, Portugal and China), including VET providers, regional authorities, industry confederations and chambers of commerce, EU-level and international networks and high education institutions.

Objectives of the CoVE project

The general objective of the project is the development of a bottom-up approach to excellence in the Tourism Sector, where the partnering Educational Providers (i.e., VET, HEIs) are increasing their ability to rapidly adapt skills provision to evolving economic and social needs.

The specific objectives of the project are:

- fostering of national/ transnational collaboration
- increase of skills anticipation in the tourism industry and of sectoral employability
- increase of investments in tourism related human resources
- achievement of a fairer, sustainable and resilient model in tourism
- fostering of internationalisation to address long standing structural weaknesses
- creation of feedback loops to adapt VET provision
- enhancing the image of VET in the sector.

The project's objectives align closely with Erasmus+ priorities by fostering inclusion, digital transformation, and sustainability within the tourism sector. The initiative's emphasis on national and transnational collaboration, skills anticipation, and adaptability aligns with the concept of vocational excellence, promoting integrated skills ecosystems and high-quality training. Additionally, the project supports EU strategic priorities by enhancing regional development, fostering innovation, and creating resilient and sustainable models in tourism, ultimately contributing to economic growth and social inclusion in the VET sector.

24.2. Activities of TOUR-X and skills developed

Activities covered

The TOUR-X project focuses on enhancing vocational education and training (VET) in the tourism sector through three main clusters:

Cluster 1 Teaching and Learning: VET providers and academic institutions drive curriculum innovation, pilot new training programmes, and introduce digital quality assurance tools. The AKMI Hospitality Lab offers hands-on training in hotel and restaurant settings, addressing workforce competency gaps. A Support Box helps tourism SMEs identify skill shortages and upskill employees. Additionally, a [Graduate Students' Tracking System](#) (GSTS) database will provide valuable insights into tourism graduates. A Validation Mechanism for Excellence in VET ensures alignment with EU standards, while regional Watchtowers forecast skill demands, supporting proactive workforce planning.

Cluster 2 Cooperation and Partnerships: Collaboration among public authorities, businesses, industry associations, and international partners ensures that educational initiatives align with market needs. Exchanges with Chinese partners promote mutual learning. Staff study visits facilitate hands-on knowledge sharing, reinforcing global partnerships.

Cluster 3 Governance and Funding: AKMI SA, along with public authorities, ensures strategic leadership, monitoring, and sustainable funding. The Funding Box connects tourism SMEs with financial support for training. The TourX Toolbox offers a transferable “Turn-Key Solution,” allowing stakeholders across Europe to implement best practices. Regional partnerships in Germany, Greece, Italy, and Spain—called Knowledge Triangles—strengthen collaboration among VET providers, businesses, and public authorities.

The diverse profiles of the project partners and their access to extensive networks have played a key role in engaging a wide range of stakeholders—from policymakers to VET providers according to the partners consulted. For example, one EU-level organisation noted that, although they may not have direct access to businesses, their position enables them to effectively mobilise VET providers across Europe and influence policymakers at the EU level. According to the consulted partners, key success factors in stakeholder engagement include the project’s responsiveness to stakeholder needs and the existence of a pre-established network of trust between partners and external stakeholders. New stakeholders are often drawn in by skill shortages and the demand for tangible outcomes. Participation in other EU-funded projects (such as the PANTOUR Blueprint project) and regional skills partnerships also facilitates access to a broad and diverse stakeholder network. Higher education institutions can provide added value through methodological approaches and training of teachers. Collaboration between higher education and VET partners is seen as a strong dimension. The project started by engaging regional authorities and policymakers in the regions where the project is implemented, such as Athens and the region of Attica. This ensures that the project’s outcomes are tailored to the specific needs of different regions.

The German partners have been identified as having best practices in engaging external stakeholders and creating synergies with other projects. They have successfully integrated their work with other initiatives, contributing to the project’s overall success. While transnational collaboration can be challenging due to the numerous activities required by the work plan, the exchange of best practices across regions was highlighted by partners as a key benefit. Another example involves collaboration with partners in China, where valuable best practices were identified—particularly the strong links between education providers and other stakeholders. Partners described this collaboration as a positive experience, underscoring the potential for mutual learning.

Skills developed

As part of the project, a skills gap analysis has been conducted across participating countries, offering valuable insights into tourism-related VET programmes.

This analysis provides a comprehensive evaluation of existing VET programmes, identifying their strengths, challenges, and opportunities for strategic improvement. Key findings highlight areas where curricula should evolve to better align with both current and future workforce demands, with a particular emphasis on digital skills, customer service, sustainability, and leadership.

The project targets occupation-specific skills that are directly relevant to current industry needs, alongside essential soft skills such as communication, teamwork, and leadership. Concerning occupation-specific skills, the CoVE targets specific training in hospitality management and travel agency operations, covering both basic and advanced levels (EQF levels 3 to 7). Emphasis is also placed on developing digital competences, transversal skills, and crucially, green skills, given the increasing importance of sustainability in tourism.

The project coordinator highlighted the **role of hospitality labs** within the COVE project as an example of innovative methods and pedagogy. These labs serve as a cornerstone for delivering

hands-on, practical training to students. They embody a “learning by doing” approach, allowing learners to gain real-world experience in professional environments such as hotels and restaurants. Developed in collaboration with leading employers in the tourism sector, the labs will ensure that the training provided is directly aligned with industry standards and expectations. This close industry partnership enhances the employment readiness of graduates. Moreover, the hospitality lab model, originally developed by AKMI, is being successfully transferred and adapted in other participating regions, including Spain, Germany, and Italy. This model effectively bridges the gap between education and employment, equipping students with both the theoretical foundation and practical skills required for the tourism sector. Another example of innovative methods and pedagogies was highlighted by Spanish partners, namely project-based learning (PBL). One example involved an event engaging students from different areas like culinary arts, front-office operations. In addition, scenarios for customer service, and collaborative digital tools (e.g., Schoology, Genially) have been introduced. Microlearning modules and podcast formats are also being explored to supplement traditional instruction.

The CoVE project, in collaboration with higher education institutions, focuses on advancing the professional development of teachers and trainers through the Train the Trainers (ToT) course and the design and implementation of a specialised curriculum (CV) tailored to the tourism sector. This initiative equips professionals with both theoretical knowledge and a broad range of practical skills, ensuring they are well-prepared to meet industry needs. The ToT programme is co-developed by dedicated working groups from partner institutions. Hellenic Open University (HOU) leads the development of the module on digitalisation and new technologies, ensuring that trainers remain up-to-date on emerging tools and trends relevant to tourism education. Additionally, the regional approach incorporates modules on sustainability, culture and heritage in tourism, and accessibility and inclusivity, the latter developed in collaboration with AKMI.

Another key component supporting teacher development is the study visits, which serve as a significant capacity-building opportunity. One of the partner organisations overseeing this activity emphasised the importance of these visits, which are conducted across various countries and regions. They enable participants to observe diverse training methods and facility management practices within different contexts. Partners recognise these visits as invaluable experiences, providing full immersion and practical insights to enhance teaching methodologies and improve tourism education standards.

The higher education institution consulted emphasised that the use of EU frameworks is a core principle of the CoVE project, ensuring that both training materials and their delivery adhere to European standards. This alignment is applied throughout the design phase, particularly in mapping digital and green skills to relevant EU competence frameworks. By integrating these frameworks, the project guarantees consistency, quality, and recognition across partner countries. Competences are carefully mapped to EU-level references, enabling the issuance of certificates that are valid and transferable throughout the EU. This approach not only enhances the credibility of the training but also strengthens learner mobility and employability at the European level, fostering a more interconnected and skilled workforce.

24.3. Results expected and achieved

Contribution to the development of qualifications

While it is too early to observe tangible results, the TOUR-X project is working towards enhancing and developing qualifications that are industry-relevant and widely recognised. The initiative aligns training with established occupational profiles, ensuring that the skills taught meet the expectations of businesses and professional associations.

To ensure recognition and accreditation at both national and transnational levels, the project collaborates with national authorities. In Greece, EOPPEP, the national certification agency, plays a key role in qualification validation, study visits, and mobility schemes. Within TOUR-X, EOPPEP supports quality assurance and the development of Individual Learning Accounts

(ILAs) and micro-credentials, promoting learner mobility across European vocational education systems.

While some countries rely on national certification bodies, others manage qualification translations through regional authorities—such as in Italy, Spain, and Germany, where local governance ensures alignment with national standards. Additionally, the project fosters international cooperation, partnering with a Dutch foundation specialising in micro-credentials, which contributes to the development and issuance of validated qualifications with good potential for transferability.

One of the project's key objectives is the development and issuance of 1,000 micro-credentials, providing flexible and targeted learning opportunities aligned with emerging industry demands. Certification processes ensure these qualifications are recognised by public employment services and certification bodies, enhancing their portability and workforce value.

A significant deliverable within the project is the ILAs & Micro-Credential Box, which includes an ICT tool, methodology, and digital application for implementing ILAs and micro-credentials. This resource supports VET providers in integrating micro-credentials into a variety of vocational programmes and occupations.

Through these initiatives, the CoVE project aims to support the development, accessibility, and transferability of vocational qualifications, strengthening the tourism workforce across Europe.

Contribution to enhancing the quality and attractiveness of VET

While it is still too early to measure tangible impacts on VET systems at the local, regional, and national levels, stakeholders have identified several instances where the project has already strengthened—or is expected to strengthen—the attractiveness and quality of vocational education and training. These early indicators suggest positive developments, including increased engagement with industry, improved alignment with labour market needs, and enhanced visibility of VET within broader educational and innovation strategies

- The advancement of the knowledge triangle model, designed for seamless transferability within the Pact for Skills and across the EU, strengthens collaboration between education, research, and business. Its integration within the Pact for Skills enhances skill development, fostering innovation and economic growth at both regional and European levels. Additionally, the involvement of Chambers of Commerce helps bridge the gap between industry and education providers, while also contributing to the development of regional strategies informed by the lessons learned from the project. For example, one partner noted that waste management practices identified in the German hospitality sector are expected to be replicated in Greece.
- New synergies have been established through knowledge triangles, fostering stronger connections between education, research, and industry. This is enhanced by the internationalisation efforts of VET schools, enabling cross-border collaboration and knowledge exchange.
- Sixteen policy recommendations will be developed to address the needs of policymakers, businesses, and academic institutions. Each recommendation is to be specifically tailored to the national or regional context of Spain, Italy, Greece, Germany, and Switzerland, providing a comprehensive analysis of shared challenges and structural differences within European VET systems. This comparative approach enhances adaptability, allowing insights and recommendations to be replicated in other countries, such as France, where they can be adjusted to fit local educational and economic frameworks.
- Development of an assessment tool for excellence in VET, which is based on the experience and indicators established by the European Training Foundation (ETF). ETF has long held the competence to certify VET centres as excellent, based on a comprehensive set of 50 to 60 indicators. While the tool developed in the TOURX CoVE context does not in itself confer the status of excellence, it serves as a critical first step

toward that recognition. Its purpose is to encourage VET centres to engage in self-assessment and continuous improvement, paving the way for eventual accreditation. The tool will be piloted in ten VET centres, with the objective of achieving successful implementation in at least four. It will be made available online, and its deployment will take place in partnership with schools, ensuring practical integration into real educational settings. Although still at an early stage, the initiative demonstrates strong potential for broader impact. Similarly a tool to gather feedback among tourism graduates will be used to better tailored training programmes and align them with labour market needs.

- The consortium partners emphasised the alignment of the project with the Pact for Skills, which aims to set up regional skills partnerships. A VET provider partner also noted the Union of Skills and mentioned the importance of joint qualifications and governance bodies like the European Skills High-Level Board. The partner expressed that the Union of Skills provides a policy objective, but the Pact for Skills offers a more practical approach for coordination and implementation at the regional level. He highlighted the need for representation in governance bodies to ensure impactful collaboration.
- There is a need for stronger alignment between BluePrint and CoVEs according to one of the partners consulted. In their view, there is a need for better integration between Blueprint and CoVE projects to ensure that sectoral strategies are effectively implemented at the regional level. Blueprint projects often work independently and may not fully understand the importance of regional cooperation, which is essential for addressing local needs.
- Spanish partners explained that TOURX has supported upward convergence by fostering mutual learning between Fuerteventura—an outermost region with historically limited access to EU networks—and more developed areas. The island's success stories in internationalisation and active learning have enriched the project overall. A key moment was the study visit to Fuerteventura, which offered participants an immersive experience in vocational education, technological innovation, and sustainable tourism. The visit showcased Spain's flexible VET system, strong public-private collaboration, and the integration of cultural heritage, natural resources, and renewable energy into regional development—providing valuable insights adaptable to other regions.

24.4. Success factors

Added value of TOUR-X

One of the project's most tangible benefits is the provision of high-quality, freely accessible training materials. Partners consulted explained that these resources have been carefully developed and piloted, ensuring that they are not only pedagogically sound but also aligned with real-world needs. Making these materials available to end users – particularly VET centres and their networks – represents a valuable contribution to improving vocational education across participating regions and beyond.

The primary direct beneficiaries of the project are VET centres, which will gain access to innovative curricula, assessment tools, and training content. By equipping these institutions with updated and sector-relevant resources, the project supports their capacity to offer more effective, modernised, and responsive vocational education. As VET centres enhance the quality of their training provision, students benefit from improved curricula that reflect the current needs of the labour market – particularly in the tourism sector. This results in higher-quality education and stronger alignment with evolving skill demands.

Companies, in turn, can gain access to a better-prepared and more qualified workforce. During the development of materials under Work Package 3, the consortium took into account not only

the specific needs of the tourism industry but also broader labour market trends and requirements. This ensured that training content is relevant, practical, and forward-looking.

In this way, the project creates a mutually reinforcing cycle of improvement: as VET centres are supported and motivated—particularly through tools like the VET excellence assessment—they become better equipped to serve both learners and employers. Ultimately, the initiative aims to strengthen the entire VET ecosystem in the sector by fostering cooperation, raising standards, and ensuring that vocational training delivers real value to individuals and industry alike.

Potential for sustainability, scalability and transferability

The sustainability of the project appears promising according to partners. In their view, VET schools themselves play a central role in ensuring its long-term viability. If these institutions successfully pilot the courses and are able to integrate them into their standard curricula, sustainability can be achieved organically. Once embedded, these VET schools can serve as models of good practice, inspiring other schools to adopt and adapt the materials independently. The involvement of regional authorities will be critical; if they find ways to incorporate some of the policy recommendations into their own educational or labour market frameworks, this could further support the continuity of project outcomes beyond the funded period.

The training materials and curriculum developed can be freely disseminated to other VET centres, which can then incorporate them into their own programmes without external funding. In particular, private VET providers have the capacity to fund integration efforts themselves, which enhances the project's scalability and durability. The same principle applies to the assessment tool for excellence in VET, developed as part of the Erasmus+ project. This tool is freely accessible, and its long-term value lies not in the need for further investment but in the extent of its dissemination and adoption. The materials and tools developed—such as the VET excellence assessment tool and tailored curricula—are freely available and designed for easy integration into existing training frameworks. This approach reduces reliance on continued funding and empowers VET providers, particularly private centres, to take ownership of implementation using their own resources.

In terms of **long-term sustainability**, the project incorporates clear strategies to ensure that its results remain accessible and replicable well beyond the funding period according to the project coordinator. The materials and tools developed—such as the VET excellence assessment tool and tailored curricula—are freely available and designed for easy integration into existing training frameworks. This approach reduces reliance on continued funding and empowers VET providers, particularly private centres, to take ownership of implementation using their own resources.

The umbrella organisation involved in the project is well-positioned to support this dissemination, leveraging its network to maximise uptake and ensure that the project's legacy endures.

In terms of transferability, the strength of the project lies in its strategic approach to **regional adaptation**, ensuring that its outputs are not only relevant but also responsive to the specific needs and contexts of different territories. According to partners, by tailoring the tools, recommendations, and training materials to local realities, the project enhances both immediate relevance and long-term uptake. This flexibility supports stronger integration at the grassroots level, increasing the likelihood of sustained use and further development by regional stakeholders.

At the same time, the project is designed for transfer to the European level. Through its alignment with the European Commission's Pact for Skills initiative, the project serves as a model that could be replicated and scaled in other countries and regions. This connection ensures that the project's achievements are not confined to its initial scope, but instead contribute to broader European objectives related to skills development and workforce resilience.

A key replicable element of the project is the promotion of knowledge triangles, which foster structured collaboration between VET providers, SMEs, and policymakers. This model enhances the relevance and responsiveness of training to real labour market needs – particularly in sectors like tourism, which face both evolving skills demands and regional disparities. The knowledge triangle approach not only supports effective skills development but also provides a transferable framework for other regions to address their own workforce challenges in a coordinated and strategic manner.

24.5. Overall impact and lessons learnt

The COVE project is expected to generate significant impact at local, regional, and national levels, particularly in revitalising and transforming the tourism sector through skills development. One of the key outcomes is the increased attractiveness and adaptability of VET in tourism-related professions, making them more responsive to the evolving needs of employers according to partners consulted. This responsiveness will enhance the effectiveness of VET in addressing skills gaps, supporting a more innovative and sustainable tourism economy, especially at local and regional levels. The project also contributes to a more comprehensive and inclusive approach to skills provision, encouraging wider participation from non-typical learners and adults in lifelong learning programmes at EQF levels 3-5. By promoting better recognition and certification of skills, it will improve employment outcomes and career progression for learners.

Moreover, it aims to foster a cultural shift among tourism sector employers – particularly micro and SMEs – towards greater involvement in training. This, combined with the project's contributions, is expected to support the sector's full recovery from the negative impacts of COVID-19.

At the EU level, the COVE project is set to deliver substantial and lasting impact by strengthening the tourism industry's resilience, innovation, and international competitiveness. One of the key outcomes will be the enhancement of mobility within the sector, supporting internationalisation as a means to overcome long-standing structural challenges. The project also fosters strong, enduring partnerships between the VET community and the world of work across borders, laying the foundation for a more integrated and responsive European skills ecosystem in the sector. A major milestone will be the establishment of the CoVEs in tourism, which will serve as a space for policy reflection and strategic coordination at the European level. Additionally, the project contributes to increasing the operational capacity of local and regional VET providers, enabling them to better address European priorities. By improving skills anticipation for tourism-related applications and aligning VET with emerging trends, the project helps reinforce the EU's position as a global leader in the tourism industry.

25. VOLTAGE – Vocational Training in the Battery Industry

25.1. About VOLTAGE

Background information

- **Project name:** VOLTAGE – Vocational Training in the Battery Industry
- **Duration:** 2024-2028
- **Call year:** 2023
- **Project status:** Ongoing

VOLTAGE is a Centre of Vocational Excellence led and coordinated by the Gothenburg Region, Sweden. The project involves 14 partners across 5 countries (Portugal, Sweden, Turkey, Germany and Finland), including VET schools, non-profit organisations, private companies and public authorities.

Objectives of the CoVE project

The VOLTAGE aims to establish Centres of Vocational Excellence (CoVE) across several regions in Europe for the burgeoning battery industry, to ensure the long-term necessary skills supply to the many battery factories currently being established in Europe.

Aligning with European priorities, the CoVE aims to support the battery industry's rapid transformation as key to the green transition and digitalisation of industries across Europe. A key focus of the project is the capacity building of VET providers and teachers. Through training and professional development initiatives, VOLTAGE aims at equipping educators with the necessary skills and knowledge to effectively train the next generation of battery industry professionals. In line with the green and digital transitions sweeping across Europe, VOLTAGE plays a pivotal role in accelerating these transformative processes.

By sharing best practices, success stories, and project outcomes, the project aims to inspire stakeholders, policymakers, and the wider community. Ultimately, VOLTAGE envisions a future where regional and transnational collaboration in the battery industry thrives, powered by a skilled and knowledgeable VET workforce.

By embracing the opportunities presented by the green and digital transitions, the project aims to contribute long-term to new job opportunities, stimulate economic growth, and contribute to the overall sustainable development of Europe.

25.2. Activities of VOLTAGE and skills developed

Activities covered

The VOLTAGE project is organised into five interconnected work packages, each addressing a different aspect of the project, i.e., teaching and learning, cooperation and partnerships, governance and funding, impact and dissemination, and project management. These packages are designed to ensure a comprehensive approach to achieving the project's goals and facilitate efficient management and coordination of activities through their interplay.

In particular, the CoVE activities clusters aim at:

- **Cluster 1 – Teaching and learning:** Enhancing the capacity of education providers in the participating regions to deliver training and education that aligns with the evolving needs of the industry.
- **Cluster 2 – Cooperation and Partnership:** Establishing effective mechanisms and platforms to bridge the gap between the education system/education providers and the industry, fostering collaboration and co-creation of programmes and initiatives; and

increasing the attractiveness of the sector by promoting vocational education and training as a viable and rewarding career pathway for individuals.

- **Cluster 3 – Governance and funding:** Facilitating collaboration and knowledge exchange between the participating regions to strengthen the skills ecosystem and share best practices in vocational education and training, and contributing to the "upward convergence" of VET excellence by aligning the project activities with EU VET policy and actions, promoting growth and fostering innovation.

In terms of developing local ecosystems, the initial phase of the project has concentrated on the Swedish local level. This approach was chosen based on the partners' prior experience and the maturity of collaborative structures in Sweden. The country serves as a good example, having established strong cooperation among diverse stakeholders over several years. An example of this is the Teknikcollege model¹⁴⁹ from Sweden, which integrates hands-on learning with real-world industry needs.

The project brings together a range of stakeholders, each with access to different networks. For instance, the industrial cluster in Vaasa (Finland) plays a key role by organising major events that gather prominent actors from the energy sector. These events provide a platform for consortium members to engage with relevant players. In Portugal, the project has established connections with the automotive industry, further strengthening its outreach. A key aim is to consolidate the competences and networks of the partnership and leverage them at the EU level.

The initiative also builds on previous EU-funded projects such as [CABATT](#) and [ALBATTs](#). Trainers from the CABATT project are now involved in the VOLTAGE CoVE, while the ALBATTs project has facilitated contacts with the Pact for Skills. These linkages are expected to create a snowball effect, helping to attract additional partners. Planned exchanges of trainers between Finland and Sweden will further reinforce this dynamic.

Overall, partners explained that the focus of the CoVE is highly relevant and timely, which has facilitated the attraction of stakeholders—particularly policy-makers. The current geopolitical context is also seen as favourable. For example, in Portugal, the Erasmus+ National Authority has asked national partners to showcase the project. Similarly, in Türkiye, the National Agency has expressed strong interest in promoting the initiative, especially as part of efforts to increase the number of CoVEs.

While the project does not include universities as formal partners, it maintains close connections with higher education institutions. In Portugal, for example, collaboration with universities is ongoing to develop pathways for new students, with the goal of training both lower-level technicians and engineers for the battery sector. These institutions are seen as key stakeholders, particularly for strengthening the capacity of teachers within VET system.

Finally, the consortium is awaiting initial results to further support dissemination efforts and deepen stakeholder engagement as the project progresses.

Skills developed

The project has a clear vision to focus on developing technical skills for the battery sector, including battery production and integration, battery maintenance, electric vehicles (EV), etc. Additionally, it aims to incorporate essential transversal skills such as safety, teamwork, problem-solving, digitalisation, and the green aspects of battery technology. Project partners recognise the importance of circular economy principles and environmental sustainability within the battery industry in the EU.

The team is making use of various tools and frameworks available at the EU level to develop a comprehensive framework for the battery sector. The importance of validation across Europe is emphasised, advocating for the use of a consistent taxonomy. Partners argue that tools such as

¹⁴⁹ Collaborating for success (2024) <https://voltage-cove.eu/collaborating-for-success/>

DIGCOMP, GREENCOMP and the European Skills, Competences, Qualifications and Occupations (ESCO) are useful as they have been validated at the EU level for several years and are already in use in multiple countries. This consistency is crucial for the industry, as it allows for the free movement of skills across Europe and ensures that these skills are recognised in different countries. The Automotive Skills Alliance, which has a hub where all skills are mapped, is also being used, particularly for its relevance to the automotive industry. This ensures that skills and contents are recognised not only by educational institutions but also by the industry.

In terms of using innovative methods and pedagogies, the CoVE is planning on making use of VR and AI. Several partners in the consortium in Germany are very competent in the field according to the project coordinator.

Concerning the support for the professional development of teachers and trainers, during the first year, efforts have been made to launch the first EU Training of Trainers (ToT) programme, where various countries will send teachers who will then act as multipliers in their respective regions. This involves online mandatory training, onsite training at the Battery Centre in Gothenburg, and follow-up online sessions. Collaboration with associated partners like the Free University of Brussels for practical training are also foreseen. The rollout of this process at the national level is set to start this year. Additionally, the development of training materials will also begin this year. Partners explained that it is crucial to engage both schools and teachers in this process to ensure the successful creation and implementation of the training materials.

Leveraging the [ALBATTIS](#) project, the team developed some online training modules as an introduction to the ToT. In June 2025, a two-and-a-half-day on-site training session was held at the battery center in Gothenburg. Additionally, in February, a group of teachers visited the University of Brussels, which has a highly regarded research lab focused on batteries. This visit provided an introduction to battery production and allowed all participating schools to benefit from the experience.

Following the training in Gothenburg, there will be online sessions where all teachers will collaborate to develop strategies for the national rollout. This rollout is scheduled to begin after the summer. During the transnational meeting in May 2025, in Türkiye, served to discuss the topics for the next train-the-trainer session. They will consider the needs and capacities of partners in terms of training. Based on this information, the project will develop training materials tailored to the needs of different countries. It is important to note that there may be differences in regulations and other factors that will mean training will need to be adapted accordingly.

Partners explained that the recognition of skills is a challenging topic in the current landscape. The project is actively addressing this issue by aligning with the Union of Skills, aiming to create a robust validation system that meets the needs of both the industry and educational sectors. They also explained that the Union for Skills focuses on attracting and retaining talent, as well as reskilling and upskilling. The project aligns with these priorities by making the battery industry more attractive to young students and providing professional development for teachers. Partners agreed that the Union for Skills and the concept of CoVE should be aligned, as both integrate green and digital skills and promote regional cooperation. The project aims to support these goals by enhancing collaboration and sharing best practice.

25.3. Results expected and achieved

Contribution to the development of qualifications

Overall, the project is actively working on integrating battery-related qualifications into national systems and exploring the potential for micro-credentials. However, partners explained that it is too early to speak about the VOLTAGE's contribution to the development of qualifications and discussions are currently ongoing.

In Türkiye, a training programme has been developed to provide in-service training for VET high school teachers in Bursa on the fundamentals of battery technologies and battery manufacturing.

For instance, in Sweden there are ongoing discussions with national school authorities about implementing national courses within the battery sector. In Portugal, the national catalogue of qualifications is being reviewed, and Portuguese partners are working towards integrating new qualifications related to battery production.

While not yet decided, the project is considering the development of micro-credentials as a way to address training needs, depending on the national systems of the partner countries.

Contribution to enhancing the quality and attractiveness of VET

The project is in its early stages, but the team has already outlined several preliminary steps aimed at enhancing the quality and attractiveness of VET.

- In Sweden, there is a comprehensive strategy in place focusing on competences, skills, and investments to attract students into VET. The CoVE project includes a plan to organise a round table where policymakers and other stakeholders will gather. The purpose of this round table is to contribute to the ongoing discussion about VET while ensuring the sustainability of the CoVE initiative. This approach aims to highlight the importance of VET in Sweden and secure long-term support and engagement from key stakeholders. In Turkey, partners also acknowledge the need that the country has for VET students, especially for the automotive industry. They are currently working with the national stakeholders to add some curricula in the region. Additionally, policy makers are aware of the need to establish VET schools focused on battery technology given the regional needs.
- In Portugal, project partners highlighted that the initiative is instrumental in developing the capacity of teachers and developing new courses for students. This effort is crucial for attracting investments in the battery industry. Additionally, the project aims to make technology and the battery industry more appealing to young students, with a particular focus on encouraging girls to pursue these fields.
- In Finland, partners noted the importance of the VOLTAGE project in attracting investments in the Vaasa region. The project aims to ensure that Finland has the necessary skilled labour force to support the battery industry, which is crucial for attracting and retaining investments. They explained that in the Vaasa region, there is an initiative called [GigaVaasa](#), which aims to attract battery material/production-related investments.
- In Turkey, there is a significant need for VET students in the automotive and battery sectors. The project helps establish networks with industry and government to meet these needs and promote VET education.

In terms of partnerships aimed at enhancing VET provision and skills development, several key collaborations were highlighted. For instance, the Swedish Battery Centre held experience sharing meetings with Turkish partner on establishing a battery center. These centers will provide both theoretical and practical training, ensuring a comprehensive learning experience.

In Portugal, project partners are closely working with MOBINOV, the automotive cluster, to engage with the industry and organise relevant events. This collaboration aims to bridge the gap between education and industry needs.

In Finland, the project collaborates with the local energy cluster in Vaasa, among other actors across regions. This collaboration has already included the organisation of an international event during the EnergyWeek and may involve further events in the future, offering opportunities for knowledge exchange and industry engagement.

25.4. Success factors

Added value of the CoVE

Consulted partners highlighted several examples which illustrate the added value already achieved by VOLTAGE.

Firstly, they mentioned the role of the project in establishing new networks. A partner from Turkey explained that the project helped to establish networks with the battery industry, which was a new area for them. For example, they are now working with the Battery Technologies Association in Turkey to develop curricula and lobby for increased training in universities and VET schools.

Similarly, the internationalisation dimension of the project was thought to be very beneficial for the exchange of knowledge and best practices across countries. The Swedish partner brought up the benefits of the European perspective to the regional battery industry in Gothenburg. In their view, this is crucial for its development, especially given the challenges faced by the battery factories in Sweden. Additionally, exchanges in the context of the ToT programme is also perceived as an added value of the project derived from the international dimension of the project as it includes online and onsite training sessions at the Battery Centre in Gothenburg.

The added value of the CoVE was also perceived in its contribution to supporting local and national initiatives, as explained above.

Partners in the project also emphasised the added value of teacher capacity building, which benefits their organisation by enabling the development of new courses and upskilling initiatives. For instance, the Teachers Forum was created as a digital platform for teachers to share resources and best practices, and the train-the-trainers programme includes online and onsite training sessions at the Battery Centre in Gothenburg.

Finally, the project aims to increase the attractiveness of technology and the battery industry to young students, particularly girls. Five girls' camps are planned across the participating regions, offering hands-on activities combined with inspiration from female role models in the industry, including opportunities to engage directly with ambassadors and visit industry sites.

Potential for sustainability, scalability and transferability

The project's sustainability is likely to be significantly enhanced by its attractiveness, particularly through the involvement of women, according to the partners consulted. This inclusion aspect is expected to contribute to the project's long-term viability. Additionally, engaging policymakers and using the project to influence local strategies are crucial elements. ToT sessions also contribute to the sustainability of the project as it aims at building local capacity, enabling knowledge and skills to be transferred and retained within the organisation or community beyond the project's duration.

The project includes ambassadors who are expected to inspire others to pursue careers in this field. Partners have emphasised the importance of VOLTAGE being sustainable, as it addresses a highly relevant topic in Europe. The project is building on a critical need, and there is a specific plan in place to ensure its sustainability.

Regarding scalability and transferability, partners have explained that the VOLTAGE project builds on the ALBATTIS project, with VOLTAGE being a spin-off. This continuation of ALBATTIS's legacy suggests that similar initiatives can be replicated and expanded, potentially extending into higher education. The project is seen as a model of collaboration, setting a framework and structure that can be applied to other sectors. The approach to teacher capacity building and training is designed to be transferable to other projects and sectors, ensuring broad applicability and impact.

Additionally, within the scope of the project, the "Funding Possibilities for Vocational Education And Training Providers" report was prepared to support VET providers in Europe in accessing

regional, national, or international funding sources through which they can implement similar project ideas.

25.5. Overall impact and lessons learnt

The project aims to create a more prepared and well-situated battery industry in Europe, ensuring that the necessary skills and competencies are developed to support the industry's growth. By building the capacity of VET providers to ensure they have the necessary skills and knowledge, the project equips educators to train students effectively in the battery sector. Overall, the project contributes to building a strong and robust European battery industry that can remain competitive in the global marketplace while also enhancing self-sufficiency in a volatile geopolitical context.

The project focuses on making the battery industry more attractive not only to young students – particularly girls, in order to address the gender gap and foster a more diverse workforce – but also to professionals seeking new employment opportunities or career changes, thereby widening the pool of talent entering the sector.

In terms of lessons learnt, partners highlighted the importance of collaboration. Effective collaboration between educational providers, industry, and policymakers is crucial for the success of the project. The establishment of networks and partnerships has been a key factor in advancing the project's goals. Additionally, bringing a European perspective to regional initiatives enhances the project's impact and ensures that best practices are shared across countries. Investing in the professional development of teachers is essential for the sustainability of the project. The train-the-trainers programme and the Teachers Forum is expected to contribute to building a skilled workforce. Initiatives like girls' camps, short films and industry ambassador programmes are expected to raise awareness about the battery industry sector potential and career paths.

Sources

CoVE	Interviews conducted	Websites and publications consulted
3LoE	Dr Max Hogefoster (coordinator/lead partner) – Hanse-Parlament, Germany Heidrun Bichler-Ripfel – Institute for Applied Research on Skilled Crafts (IAGF), Austria Nikolaus Schrumpf – Wirtschafts-Förderungsinstitut der Wirtschaftskammer Steiermark, Austria Joachim Von Kiedrowski, Uwe Schaumann – Berufliche Hochschule Hamburg, Germany Renata Cerneckiene – Business and Hospitality Training Centre Vilnius, Lithuania Marek Łukasik – Uniwersytet Pomorski w Słupsku, Poland	3LoE website: https://3-loe.eu/ 3LoE Overview of main activities and results of the project: https://3-loe.eu/wp-content/uploads/Overview-of-main-activities-and-results-of-the-project.pdf Three-level centres of professional excellence "Green Economy for SMEs" and transnational platform: Part C Implementation, Evaluation & Business Models: https://3-loe.eu/wp-content/uploads/Result-2.2-Three-level-centres-of-professional-excellence-Part-C-Results-COVE.pdf Results of partner evaluation of the establishment and long-term continuation of COVEs: https://3-loe.eu/wp-content/uploads/Partner-evaluation-of-the-establishment-and-long-term-continuation-of-COVE.pdf
AEDIL	Isabel Sande Frandsen, Foreningen af Mejeriledere og Funktionærer (Denmark), lead project coordinator Dr. Metin Güldas, Bursa Uludağ Üniversitesi (Türkiye), project coordinator Özlem Kaner, SUTAS Group (Türkiye), company partner Dr. Seamus O'Mahony, University College Cork (Ireland), project coordinator Torsten Sach, Zentralverband Deutscher Milchwirtschaftler (ZDM, Germany) project coordinator Cecilie Wittnebel, Kold College (Denmark), project coordinator	AEDIL Dairy CoVE: https://dairysectorskills.com/about/ Anfopeil: https://anfopeil-enil.fr/projets/ Erasmus+ Project "European Excellence in Dairy Learning" – Aarhus University: https://food.au.dk/collaboration/international-collaboration/erasmus-project-european-excellence-in-dairy-learning Erasmus+ projects database: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/opportunities/projects-details/43353764/101055548/ERASMUS2027
AGRIFOOD4FUTURE	Irene Diti, Università Cattolica del Sacro Cuore (Italy), Project Manager Mike Kaminiaris, AGENSO (Greece) Stavroula Tsigkou, AKMI International (Greece) Bochra Kammoun and Amandine Juhel, ARVALIS (France) Soraia Silvia, Claudia Costa (Food4Sustainability), Lara O. Ramos (ISQ), Tania S. Avelino (ISQ), Barbara Barros (Universidade do Porto) Catarina Casadinho (BGI) (Portugal)	Erasmus+ Application D2.1 (Report on the job and training needs analysis) D2.2 (Finding report on the state-of-the-art and knowledge) D2.3 (Handbook with Best Practices in the VET and Higher Education Ecosystems in the Agrifood Sector) https://agrifood4future.com/

CoVE	Interviews conducted	Websites and publications consulted
AI4VET4AI	Project Coordinator, Algebra University (Croatia) Co-Founder/Strategic coordinator, AlterContacts, (Netherlands partner) Director/Project Manager, Solvership (Croatia partner) Researcher-Lecturer/Project Partner, FIŠ - Faculty of Information Studies (Slovenia partner) Project Manager, Inercia Digital (Spain partner) Department Lead/Coordinator, The Management Center Innsbruck (MCI) (Austria partner)	-
AILEEN	Adelaide Almeida, Project Coordinator, European Welding Foundation (EWF) Wim Verlinde, Project Partner, Asturias Hub Defense (Spain) Alberte Kristine Schou-Larsen, Project Partner, Center for Defence, Space & Security (CenSec) (Denmark)	-
Auto CoVE 2.0	Elina Kollanus, Omnia (coordinator/lead partner) Jeroen Smetsers – Electude International (consortium partner, Netherlands) Ismael Mirzajev – Estonian University of Life Sciences (consortium partner, Estonia) Michael Seefried – Technische Hochschule Würzburg-Schweinfurt (consortium partner, Germany) Marko Aaltonen – Finnish National Agency for Education (EDUFI) (Finnish CoVE partner)	Auto CoVE 2.0: https://www.autocove.eu/ Auto CoVE 2.0 courses piloted: https://www.autocove.eu/study-courses/ Auto CoVE 2.0 Report: 'Greening Europe with support of Clean-tech Vehicle Education: https://www.autocove.eu/wp-content/uploads/2025/01/Auto-Cove-2.0-D2.1-Development-trends-in-vehicle-fleet-vehicle-sales-and-maintenance-services.pdf
Care about IT	Jessica Knopper, Project Coordinator, Noorderpoort (Netherlands) Elvira Coffetti, Project Partner, Network Zon (Netherlands) Miriam Korstanje, Project Partner, Katapult Network (Netherlands) Irene Miretti, Project Partner, APRO Formazione Società Consortile (Italy) Jenna Pesola, Project Partner, City Of Turku (Finland)	Care about IT Care4Skills GreenComp Higher education – Italy. Katapult Network Zon Pact for Skills The European Green Deal APRO

CoVE	Interviews conducted	Websites and publications consulted
CATALYST	Rhonda Bowen, Bells Solutions (Germany), business partner Victoria Funk, Collaborating Centre on Sustainable Consumption and Production (CSCP, Germany), project coordinator Nuno Jorge Matos, ICAA (Associação para a Gestão do Capital Intelectua, Portugal), NGO Karin Kronika, BEST Institute for vocational training and personal training GmbH (Austria), project coordinator Florinda Matos, Instituto Universitario de Lisboa (ISCTE, Portugal), project coordinator Rui Soares, CENTIFME (Portugal), business partner Fatima Suleman, Instituto Universitario de Lisboa (ISCTE, Portugal) Angelina Taneva-Veshoska, Institute for Research in Environment, Civil Engineering and Energy (IECE, North Macedonia), lead project coordinator Eleni Toli, University of Athens (Greece)	CATALYST website: https://projectcatalyst.eu/catalyst-centre/ CATALYST handbook: https://projectcatalyst.eu/wp-content/uploads/2023/11/Handbook-final.pdf CATALYST magazine first edition: https://projectcatalyst.eu/wp-content/uploads/2024/12/Catalyst-Prospectus-Magazine-1-1-ISSN-1.pdf CATALYST magazine second edition: https://projectcatalyst.eu/wp-content/uploads/2024/12/Catalyst-Prospectus-Magazine-2nd-Edition-ISSN-1.pdf CATALYST "Mapping and skills forecast report": https://projectcatalyst.eu/wp-content/uploads/2023/03/WP2-report-final.pdf Erasmus+ projects database: https://erasmus-plus.ec.europa.eu/projects/search/details/101056114
ECOVEM	Technical University of Sofia (Higher education institution) – Bulgaria Exolaunch GMBH (Industry) – Germany J-ARTECK JUGENDBILDUNGSSTATTE EV (NGO) – Germany Asociación Nacional de Centros de Formación con Certificados de Profesionalidad (Vocational Training (secondary level) – Spain CIMEA academic equivalence mobility information centre (Public authority) – Italy Cluster COMET (Industry) – Italy IAL Innovazione Apprendimento Lavoro Friuli Venezia Giulia (VET provider) - Italy Cyprus Chamber of Commerce and Industry (Social partners) – Cyprus Cyprus Productivity Centre (CPC) (Public Authority) – Cyprus European Association of Career Guidance (EACG) - Cyprus	CoVEM action plan for business-science-education cooperation (BSEC) ECOVEM_MoU_Cooperation Platform Report on the Cooperation for Sustainable VET Governance ECOVEM Competence Matrix 2023

CoVE	Interviews conducted	Websites and publications consulted
EE4M	M. Woschank, Montanuniversität Leoben (Project Coordinator) J. Retegi Albisua, University of Mondragon (Project Partner) M. Stricker, TFO Bruneck (Project Partner)	https://ee4m.eu/ https://www.fraunhofer.it/en/Research/sustainable-innovation/EE4M.html https://www.tugraz.at/arbeitsgruppen/nhb/research/all/ee4m https://copcoves.eu/files/factsheets/EE4M.pdf Zunk et al. (2024), 'Engineering Excellence for the Mobility Value Chain', ICL2023 – 26th International Conference on Interactive Collaborative Learning, p. 1573, available at https://ee4m.eu/wp-content/uploads/2024/03/Engineering-Excellence-for-the-Mobility-Value-Chain.pdf
EPLUG	Catherine Bravo, La Malvesia vocational secondary school (Spain), project coordinator Henrik Bos, European Landscape Contractors Association (ELCA) and VRJ construction and landscaping company (Finland), company partner for AhlmanEdu in Finland and leader of ELCA as honorary partner in the project on the EU level Jan Jeronimus, Yuverta vocational college (The Netherlands), lead project coordinator Juan Manuel Mondejar, PAIMED (under Projar Group, The Netherlands), company partner Kaisa Koskelin, AhlmanEdu vocational secondary school (Finland), project coordinator Paula Lorente, La Malvesia (Spain), student Victor Dumitrache, World Skills Romania (Romania), project coordinator	CoVE for Urban Greening in the Netherlands Formally Established - European Platform Urban Greening Main Initiatives in Urban Greening in 2023 From Romania Home - European Platform for Urban Greening - Urban greening is essential for climate resilience, biodiversity and the well-being of city dwellers

CoVE	Interviews conducted	Websites and publications consulted
EULEP	Birgit Arens - Eurochambres (coordinator/lead partner) Mitchell Peters – Open University of Cataluña, Spain (UOC) Seval Iskender – Turkish Chambers of Commerce (TOBB) Halis Can Sire – Adana Chamber of Industry, Turkey	EULEP website: https://eulep.eu/ EULEP report 'The development of learner and labour market needs oriented training paths': https://eulep.eu/wp-content/uploads/2024/01/WP3-Abstract_EN.pdf EULEP report 'Training Path for Social Innovation': https://eulep.eu/wp-content/uploads/2024/02/D3.3-Training-path-for-SI-1.pdf EULEP Deliverable: Workforce needs for up and reskilling in Artificial Intelligence, Virtual Reality, and Social Innovation https://eulep.eu/wp-content/uploads/2023/08/D2.1-Report-final.pdf EULEP Deliverable: Recommendations for the development of transnational training modules https://eulep.eu/recommendations-for-the-development-of-transnational-training-modules/
EUVECA	Sabine Paasch Olsen, Henriette Hansen, (coordinator/lead partner) – Region of Southern Denmark (Hospital of South Jutland) / South Denmark European Office Mark Søgaard – Regional Council, Region of Southern Denmark Henning Åge Skarbø – Helse Bergen (Edu4Health platform WP lead, Norway) Marloes Bults, Marloes Postel – Saxion (University of applied sciences, Netherlands, WP5 leads)	EUVECA: https://euveca.eu/ Edu4Health platform: https://edu4health.eu/ EUVECA Deliverable No. 1 – Baseline Report, April 2023: https://euveca.eu/wp-content/uploads/2023/12/EUVECA-Baseline-Report-D1.pdf EUVECA Report: A Governance Model of Regional Vocational Excellence Hubs (RVEHs), May 2024. EUVECA Report: Governance Model for Education4Health, June 2024 Erasmus+ projects database: https://erasmus-plus.ec.europa.eu/projects/search/details/101056415 V Model: https://www.saxion.nl/onderzoek/health-and-wellbeing/technology-health-and-care/onderzoek/v-model-technologiecompetenties-van-zorg-en-welzijnsprofessionals

CoVE	Interviews conducted	Websites and publications consulted
FEA-VEE	Giorgos Tsanis, Project coordinator - Technical Institute of Heraklion Chamber (Greece). Anca Zaharia, PHD Lecturer and FEA-VEE project expert - University of Art and Design of Cluj-Napoca (Romania).	FEA-VEE: https://fea-vee.eu/ Pact for skills Communication on skills and talent mobility - European Commission Europass Mobility Europass European Alliance for Apprenticeships - European Commission European Commission Digital Strategy - European Commission SME strategy and SME-friendly business conditions - European Commission The European Green Deal - European Commission Union of skills - European Commission
GIVE	Andrea Cenderello, Project Coordinator – Cometa Formazione (Italy) Madlen Șerban – University of Bucharest (Romania) Maria Pizzolo, Elena Cerolini – Fondazione Gi Group (Italy) Paolo Nardi – EfVET (European Forum of Technical and Vocational Education and Training) Jodie Bonnie, Duncan Vella, Joseph Zammit – MCAST (Malta) Ester Gonzalez Vara, Jugatx Menika – Lantegi Batuak (Spain)	Erasmus+ Project Fiche: https://erasmus-plus.ec.europa.eu/projects/search/details/621199-EPP-1-2020-1-IT-EPPKA3-VET-COVE GIVE Project Website: https://www.thegiveproject.eu GIVE Academy Platform: https://giveacademy.eu GIVE Final Project Summary Report (2023): Available via https://www.thegiveproject.eu GIVE Online Platform Overview: Accessible at https://giveacademy.eu Guidelines for Inclusive Vocational Excellence: Training practices.
H2CoVE	Gaute Myhren Kornberg – Vestland County Council (Norway) Ida Yap, Jogchem Meinema – New Energy Coalition (Netherlands) Maksym Karpash, Valentyn Vasechko, Nazarii-Andrii Soroka – King Danylo University (Ukraine) Pishchak Yulia Ivanovna – PRET CEPBIC EHEPTO3MIH (energy supplier) (Ukraine) Vegard Lavik – Saga Fjordbase AS (Norway) Allan Niidu – Tallinn University of Technology (Estonia) Christian Huber – FH Kufstein Tirol (Austria) Niusha Shakibi Noa – FEN Research GmbH (Austria)	About H2CoVE H2CoVE - Tartu Vocational College H2CoVE - Hydrogen Centres of Vocational Excellence - Fagskolen Vestland H2CoVE - New Energy Coalition Estonia Green Hydrogen Organisation H2CoVE Project Handbook Preliminary findings of the needs assessment conducted in The Netherlands (a presentation provided to ICF by Ida Yap)

CoVE	Interviews conducted	Websites and publications consulted
HABITABLE	Luis Hernández, AEICE, project coordinator Carmen Devesa, AEICE, project coordinator Jesús Serrano, AEICE, project coordinator Hermann Huber, FH Salzburg, project partner Feliz Praendl, FH Salzburg, project partner	Project Results Platform for HABITABLE HABITABLE website AEICE website
INVESTech	Iveta Orbanova, ASTRA, project partner, based in Slovakia Natasa Urbanickova, Technical University in Kosice, CoVE project lead, based in Slovakia Nicholas Moudouros, Frederick University, head of training, based in Cyprus Andrianna Georgiou, Emphasys centre, project coordinator, based in Cyprus Achillelas Achilleos, Frederick University, principal investigator, based in Cyprus Toumazis Toumazi, The Cyprus Computer Society, project partner, based in Greece Natassa Kazantzidou, IDEC, project coordinator, based in Greece	Deliverables - INVESTech INVESTech project application submitted to the European Commission
MOSAIC	Claire Challande Osuna, SEPR (France), project coordinator Jean-Stephan Faure, Chambre de Métiers et de l'Artisanat du Rhône (CMA Lyon, France), professional organisation Elina Kollanus, Omnia, Finland, project coordinator Ola Kukkasniemi, Wooden, Finland, business partner Susana Nogueira, EfVET (Belgium), NGO Lida Poghosyan, SEPR (France), lead project coordinator	Erasmus+ projects database: https://erasmus-plus.ec.europa.eu/projects/search/details/101055648 MOSAIC as an example of a CoVE project: https://www.oph.fi/sites/default/files/documents/CoVE%20MOSAIC%20Omnia.pdf MOSAIC project factsheet: https://wearekatapult.eu/files/Logos/Factsheets/CoVE_projects_2022_MOSAIC.pdf MOSAIC e-newsletter: https://efvet.org/wp-content/uploads/2022/11/MOSAIC-E_newsletter-FINAL-.docx.pdf MOSAIC website: https://mosaiceuproject.eu/

CoVE	Interviews conducted	Websites and publications consulted
PoVE Water Scale-up	Maëla Barçon, Hanse-Parlament, project manager, based in Germany Manuel Jackson, Stellenbosch University Water Institute, project manager, based in South Africa Merje Mölter, Järva County Vocational Training Centre, Project manager, based in Estonia Michaela Mensikova, Mendel University, project manager, based in the Czech Republic Mikael Muulmann, the Estonian Water Association, technical advisor, based in Estonia Pieter Hoekstra, CIV Water, main project coordinator, based in the Netherlands	PoVE Water Scale-up website: https://www.povewater.eu/ The PoVE Water Scale-up Project Handbook (internal, shared by the project coordinator)
PROMOTE	Catalin Chiritoiu and Andreea Todor – Timișoara Penitentiary National Administration of Penitentiaries Ministry of Justice (coordinator) Daiana Huber – Center for Promoting Lifelong Learning (CPIP) Sara Gambino – CEIPES ETS Gytis Cibulskis – Kaunas University of Technology (KUT) Alina Jusite – Lithuanian Prison Service	PROMOTE website: https://www.promoteproject.eu/ CEIPES ETS: https://ceipes.org/project/promote/ Erasmus+ projects database: https://erasmus-plus.ec.europa.eu/projects/search/details/101144006
SHOREWINNER	Teresa Nogueira, Instituto Politecnico do Porto, Portugal (project coordinator) Simos Vagenas, ENTEKA, Greece (project partner) Luca Boetti, Ifoa CSO, Italy (project partner) Félix Orjales Saavedra, Universidade da Coruña, Spain (project partner) Pavlos Papadopoulos, University of Cyprus (project partner)	https://shorewinner.eu/
Talentjourney	Adrijana Hodak, (coordinator/lead partner) – School Centre of Nova Gorica (Šolski Centre Nova Gorica – ŠCNG), Slovenia Madeline Langlois – Europäisches Institut für Innovation - Technologie e. V., Germany Arno Kolk – Estonia Electronics Websites and publications consulted:	Talentjourney website: https://talentjourney.scv.si/ Talentjourney Regional Ecosystems: https://talentjourney.scv.si/wp-content/uploads/2022/02/Wp5.2.1-Regional-ecosystem-maps.pdf Talentjourney deliverable: 'Sustainability of data collection'. https://talentjourney.scv.si/wp-content/uploads/2022/02/Wp2.2-Sustainability-data-collection-methodology-DRAFT.pdf

CoVE	Interviews conducted	Websites and publications consulted
TOUR-X	AKMI ANONIMI EKPAIDEFTIKI ETAIRIA (Coordinator) – Greece Hellenic Open university (Higher education institution) - Greece European Vocational Training Association (European organisation) – Belgium Greek-Italian Chamber of Commerce, Thessaloniki – (Industry / Social partner) - Greece EUROPAISCHER VERBAND BERUFLICHER BILDUNGSTRAGER (EVBB) – Germany Escuela de Hosteleria Europea (EHE), ASOFUER, Cabildo de Fuerteventura and Mundus (Spain) – provided written input	https://tour-x.eu/tour-x-governance-box/
VOLTAGE	Gothenburg region, Public Authority (Sweden) Oy Merinova Ab, Industry (Finland) ATEC - Academia de Formação, VET provider (Portugal) Coşkunöz Eğitim Vakfı VET Provider (Turkey)	https://www.gigavaasa.fi/ https://voltage-cove.eu/background/ https://www.project-albatts.eu/en/home https://project-cabatt.eu/

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