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Advancing European Centres of Vocational Excellence (CoVEs): An Analysis of Erasmus+ Projects

Report

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Advancing European Centres of Vocational Excellence (CoVEs): An Analysis of Erasmus+ Projects

Report

Directorate-General for Employment, Social Affairs and Inclusion
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Executive Summary

The Erasmus+ Centres of Vocational Excellence (CoVEs) are a European flagship initiative to strengthen and develop vocational education and training (VET) in Europe.

Funded by the Erasmus+ programme, Erasmus+ CoVE projects aim to enhance the quality and innovation of VET. CoVEs are not just training institutions but also collaborative networks of local and international partners that cooperate across countries, to respond to the evolving requirements of learners, businesses, and communities.

This report provides a qualitative analysis of the Erasmus+ CoVE initiative, assessing its current state and identifying projects that demonstrate strong results, impact, and potential for long-term sustainability. It draws on evidence from 25 CoVE projects funded since 2019 under Erasmus+, examining their contributions to high-quality skills development, systemic reform in vocational education and training (VET), and key EU policy priorities in the areas of vocational excellence and the green and digital transitions.

Complementary information on the CoVEs projects can also be found in a brochure that is published together with this report.

Background and policy context

Centres of Vocational Excellence (CoVEs) emerged as a concept in the early 2000s in response to the need for more responsive, innovative, and high-quality vocational education and training (VET), reaching an important milestone in 2012 with the Communication from the Commission titled 'Rethinking Education: Investing in skills for better socio-economic outcomes'[1], accompanied by a working document on 'Vocational education and training for better skills, growth and jobs'[2]. While diverse in structure and governance, CoVEs share a common aim: to meet sectoral, societal and regional skills needs through partnerships, integration into regional development and innovation strategies, and the promotion of excellence beyond traditional VET provision. Key success factors include anchoring VET in regional ecosystems, fostering knowledge triangle

[1] COM/2012/0669 final – https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex:52012DC0669

[2] SWD(2012) 375 final – https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012SC0375

collaboration with tertiary education and business, and embedding innovation in teaching and training.

Since the European Commission's 2019 mapping report, vocational excellence has become central to EU policy frameworks such as the European Skills Agenda, the 2020 Council Recommendation on VET, and the Osnabrück Declaration. More recently, vocational excellence has been reaffirmed as a central strategic priority of EU policy through the Union of Skills initiative and the Herning Declaration.

Erasmus+ has played a pivotal role in scaling the CoVE model, supporting 69 transnational cooperation projects between 2019 and 2024 that bring together diverse VET providers, social partners, and enterprises across Europe. These projects contribute to EU priorities relating to the green and digital transitions, upskilling and competitiveness, and social inclusion.

Implementation status of the Erasmus+ CoVE initiative 2019-2024 (*)

Call year	Budget (in million Euros)	Number of applications	Number of funded projects	Number of countries involved in applications	Number of countries involved in selected projects
2019**	5	16	5	27	20
2020**	28	55	7	49	25
2021	44	84	13	55	37
2022	48	76	13	54	31
2023	56	109	15	64	27
2024	56	132	16	63	32

* The 2025 Call is currently under evaluation and received more than 300 applications for an available budget of 60 million Euro

** The 2019 and 2020 calls were pilot calls under the previous Erasmus+ programme period. The 2019 pilot call was for 2-year projects.

Source: European Commission

Main findings

Roles and inputs of project partners across CoVE activities

CoVEs are defined by their international multi-stakeholder collaboration, involving VET providers and others such as higher education institutions (HEIs), industry, labour market representatives, chambers of commerce, public authorities, and civil society organisations. In the context of Erasmus+ projects, the roles of CoVE stakeholders may vary across the designated activity clusters. Overall observations reveal the following:

- **Teaching and Learning activities (Cluster 1)** are led by VET providers and HEIs, often in collaboration with industry. These activities emphasise curriculum innovation, dual education programmes/apprenticeships, and alignment with labour market needs through a focus on the anticipation of skills and labour market intelligence (LMI).
- **Cooperation and Partnership activities (Cluster 2)** aim to foster transnational ecosystems that connect education and training stakeholders, the business community, and policymakers, driven by CoVE project coordinators. Examples include joint training centres, advisory councils or steering boards, innovation hubs, hybrid learning environments, and inclusive governance structures that embed multi-stakeholder cooperation into governance.
- **Governance and Funding activities (Cluster 3)** link to CoVE projects' sustainability plans, a key feature of Erasmus+ applications. Project coordinators seek partners' commitments to embed CoVE activities into regional and national VET or industrial strategies, ensuring sustainability through multi-level governance models and diversified funding sources.

Importantly, cooperation between the VET and tertiary education plays a pivotal role in ensuring smooth learning pathways, linking education and training with research and innovation, and expanding opportunities for lifelong learning. A majority of CoVEs projects focus on both initial VET (I-VET) and continuing VET (C-VET).

Partnership development approaches

The development of CoVE partnerships is complex and context-dependent, but certain patterns stand out. Strong collaborations often evolve from pre-existing networks and shared goals, while effective models balance stability with flexibility, allowing adaptation to diverse regional and sectoral contexts.

Partnerships are typically structured as skills ecosystems that link education and training, research, business, and policy. Formal cooperation agreements and governance frameworks help embed collaboration, while flexible arrangements allow partners to respond quickly to emerging needs. Sector-specific cooperation models ensure alignment with regional strategies and labour market priorities.

Despite their strengths, partnerships face recurring challenges: engaging industry partners unfamiliar with co-developing curricula, sustaining activities beyond project funding, and reconciling differences in institutional cultures and policy frameworks. These challenges are addressed through clear articulation of mutual benefits, diversified funding, transparent communication, and shared reference points such as qualifications frameworks.

Skills development

Skills development is the core of CoVE activity, driven by rigorous labour market intelligence (LMI). Methods include surveys, foresight studies, and co-creation workshops with learners and industry.

- **Digital skills** are the most prominent, spanning transversal competences and advanced sector-specific applications, e.g. Artificial Intelligence (AI), Augmented Reality (AR), Virtual Reality (VR).
- **Occupation-specific skills** remain central, with tailored training provided across the various sectoral fields of specialisation within the CoVE projects, such as healthcare, aerospace, microelectronics, tourism, and renewable energy.
- **Green skills** are increasingly integrated, though in sector-specific contexts, e.g. offshore energy, sustainable farming, green hospitality.
- **Transversal skills** such as communication, collaboration, leadership, and adaptability are systematically embedded to prepare learners for fast-changing labour markets.

EU competence frameworks (DigComp, GreenComp, EntreComp) are widely used, though to varying degrees, from full curricular integration to inspirational reference points.

CoVEs also value pedagogical innovation. Many projects have introduced learner-centred approaches that emphasise collaboration, creativity, and problem-solving, often through project-based learning, hackathons, or challenge-driven formats. Pedagogical models are increasingly modular and flexible, allowing training to be tailored to diverse learner needs across initial and continuing vocational education and training (I-VET/C-VET), adult learning, and work-based pathways. This adaptability enables learners to combine sector-specific competences with transversal skills such as communication, teamwork, and entrepreneurship. Emerging technologies (e.g. VR/AR, AI-based tools, digital twins) are also being integrated to create authentic workplace simulations and hybrid learning environments. **By modernising pedagogies in this way, CoVEs not only improve the quality and attractiveness of VET but also ensure it remains responsive to rapidly changing labour market demands.**

Development of curricula and qualifications

CoVEs are driving curriculum innovation by embedding modular content into qualifications and offering flexible learning pathways across EQF levels. While many focus on elective modules and continuing professional development (CPD), others aim for formal inclusion in National Qualifications Frameworks (NQFs). Micro-credentials have emerged as a key feature, providing flexible, modular

learning that supports upskilling, reskilling, and lifelong learning. Several projects demonstrate **alignment of micro-credentials with the European Qualifications Framework (EQF) and ESCO, enhancing transnational recognition, learner mobility, and the portability of skills.**

Despite these advances, challenges persist. Recognition and validation of the modules and full programmes and qualifications developed, including through micro-credentials, remain uneven, with integration into NQFs varying widely across projects and countries. Uncertainties over accreditation and credit systems, combined with rigid national frameworks, limit the recognition of these flexible learning formats. The disconnect between rapidly evolving sectoral/professional needs and static national certification systems highlights the importance of coordinated European approaches.

Successful CoVEs share common traits: strong alignment with EQF principles, proactive engagement with national authorities, robust quality assurance, and close collaboration with industry partners. Sustained policy reform, transnational cooperation, and the development of European-level validation mechanisms are essential to unlock the full potential of micro-credentials and CoVE-developed curricula, ensuring they effectively address dynamic labour market demands and lifelong learning priorities.

CoVEs contribution to Vocational Excellence: Enhancing the quality and attractiveness of VET

CoVEs reinforce the concept of vocational excellence by creating inclusive, future-oriented learning ecosystems that go beyond conventional VET provision. Excellence is understood as a holistic approach, encompassing innovation, responsiveness to societal and environmental challenges, collaboration with labour market actors, and the delivery of high-quality, accessible education for all learners. Key elements include embedding VET in regional innovation ecosystems, fostering partnerships across the knowledge triangle (education, business, research), promoting inclusive learning pathways and mobility opportunities, implementing learner-centred pedagogies, integrating practical and work-based experiences, incorporating digital and transversal skills, and embedding sustainability and lifelong learning principles.

Through these approaches, CoVEs have the potential to modernise VET, strengthen sectoral innovation capacity, and contribute to the twin digital and green transitions. Strategic partnerships between education and training providers, industry, and regional actors are central to bridging skills gaps and ensuring curricula remain relevant to labour market needs.

However, significant challenges persist. Aligning curricula with rapidly evolving labour market demands, particularly in digitally and environmentally transforming sectors, remains difficult. Operationalising vocational excellence is complicated by varying interpretations, and disparities across national VET systems.

Implementing competency-based education and training and sustaining multi-stakeholder partnerships are often constrained by regulatory hurdles, institutional capacity, and teacher preparedness.

Sustainable vocational excellence requires embedding practices within governance structures, national policy frameworks, and quality assurance mechanisms. Self-assessment tools, peer learning, long-term investment, and policy alignment are essential to develop coherent, adaptive, and future-proof VET systems capable of meeting evolving societal and economic needs.

Contributions of CoVEs to VET policy strategies

CoVEs contribute to national and regional VET strategies by embedding excellence in teaching, curricula, and governance. They work closely with public authorities to modernise training provision and address sector-specific skills gaps. By aligning with regional innovation agendas, CoVEs ensure that VET provision responds to economic transformation and future skills needs.

Beyond national contexts, CoVEs act as catalysts for upward convergence in VET across Europe. Through transnational partnerships entailing peer learning and the transfer of effective models, they reduce disparities in VET quality and access while strengthening inclusiveness. Partnerships allow regions with less developed VET systems to benefit from established practices elsewhere, supporting higher quality provision.

At EU level, CoVEs align closely with major policy frameworks such as the European Skills Agenda, the Pact for Skills, the Digital Education Action Plan, the Green Deal, and the Union of Skills. They embed green and digital competences into curricula, advance the use of micro-credentials and modular learning, and connect training systems with sectoral strategies through initiatives such as Erasmus+ Blueprint Alliances. **By acting as early implementers of EU policy priorities, CoVEs translate strategic objectives into concrete practice, positioning VET as a driver of Europe's green and digital transitions, sectoral resilience and competitiveness, and long-term skills development.**

In line with the future-oriented vision for VET outlined in the Draghi and Letta reports, CoVEs help build resilient skills ecosystems by strongly linking education and training to labour market demands, tackling skills shortages, developing joint qualifications and micro-credentials, and contributing to research and innovation.

Success factors of the CoVEs: added value, potential for sustainability, scalability and transferability

Erasmus+ CoVEs are reshaping VET systems by fostering ecosystems that link education and training, business, research, and policy. They demonstrate clear added value in advancing EU skills priorities, particularly in the areas of digitalisation, sustainability, and inclusion, as well as in sectors experiencing skills

and labour shortages. Key success factors across CoVEs include modular and flexible curricula, alignment with EU and national frameworks, strong industry engagement, robust governance, and transnational collaboration. These factors contribute to sustainability by embedding initiatives within institutional structures, policy frameworks, and operational models, while supporting scalability and transferability through digital platforms, open educational resources, and adaptable methodologies.

Despite these achievements, CoVEs face recurring issues. Sustaining funding beyond Erasmus+ lifecycles, ensuring consistent industry engagement, navigating regulatory and systemic barriers, particularly around recognition, and maintaining transnational coordination remain significant challenges. Resource limitations, linguistic diversity, and differing national qualification systems can constrain scalability and transferability. Varying understanding of the “vocational excellence” concept and institutional readiness can also further complicate systemic adoption.

Overall, CoVEs illustrate the transformative potential of ecosystem-based VET, demonstrating that innovation, inclusion, and sectoral responsiveness are achievable when partnerships, governance, and support are effectively aligned. **Sustained policy engagement, diversified funding, and coordinated recognition mechanisms are essential to consolidate progress and ensure long-term impact across Europe.**

Conclusions

T**he CoVE initiative has emerged as a powerful driver of systemic change in VET, acting as a structural enabler of transformation by modernising curricula, fostering ecosystems of collaboration, and contributing to EU policy priorities relating to VET attractiveness, upskilling and reskilling, digitalisation and environmental sustainability and inclusion.**

3LoE – Three-level Centres of Professional Excellence (Austria, Germany, Poland, Lithuania, Latvia, Spain)

3LoE was led and coordinated by Hanse-Parlament, a member of the European Alliance for Apprenticeships (EAfA) since 2024. The project involved 21 partners from seven countries and 60 associated partners from 13 countries, establishing eight CoVEs focused on the green economy. Each CoVE partnership involved a VET school, a chamber of commerce, a crafts association or SME association and a university. It helped in developing new EQF-aligned qualifications, several of which have been formally integrated into national curricula. For example, in Austria, Germany, Latvia, and Lithuania, these qualifications were either integrated into national curricula or officially recognised as extracurricular qualifications. Austria’s Technical Consultant for Energy Efficiency became the first formal qualification recognised under the 2024 Higher Vocational Education Act.

CoVEs are enhancing the quality and relevance of VET through modular programmes, micro-credentials, stakeholder collaboration on identifying labour market needs, applied research and innovative pedagogies such as challenge-based learning, AR/VR simulations, and blended formats – all directly aligned with industry demands. However, their long-term impact depends on overcoming certain challenges. One key issue is the uneven recognition of micro-credentials across countries and within VET curricula. Another is the presence of gaps in teacher training, which limit the effective delivery of innovative approaches. National qualification frameworks and VET governance systems are also slow to align with rapidly evolving skills needs. In addition, sustaining funding beyond Erasmus+ project lifecycles remains difficult. Finally, the engagement with policy makers and industry is not sufficiently structured.

Employer participation is a defining strength, with many projects embedding structured company-education partnerships. CoVEs also play a vital role in building sectoral and regional ecosystems where trust, clarity, and adaptability underpin sustainable collaboration between VET providers, businesses, policymakers, and civil society. Nonetheless, learner and worker involvement in governance and curriculum co-creation could be further strengthened.

CoVEs are contributing to the digital transition, while efforts on the green transition, though significant, are less evenly embedded across sectors. Greater integration of green competences into all occupations is needed to ensure resilience and balance in addressing the twin transitions.

While there is evidence of certain CoVEs influencing policymaking, short project cycles and the resulting limited ability for structured longstanding engagement with policymakers constrain long-term impact.

Drawing on these findings, the **recommendations** – primarily aimed at stakeholders interested in the CoVE initiative and public authorities – include:

- Scaling pedagogical innovations through stronger investment in teacher training, digital infrastructure, and curriculum alignment, supported by systematic monitoring to embed practices and enhance vocational excellence.
- Establishing permanent mechanisms for engaging employers, learners, and workers in curriculum design.
- Supporting multi-actor ecosystems with clear governance, incentives, and peer learning opportunities.
- Promoting balanced integration of digital and green skills across all sectors.
- Encouraging early and continuous policy engagement to maximise system-level influence.

- Strengthening sustainability through diversified funding models, communities of practice, and even closer alignment with other EU initiatives (e.g. Pact for Skills, European Alliance for Apprenticeships).

The **strategic value and future direction** of CoVEs lie in their capacity to transform structures and processes, providing models that endure beyond project lifecycles. They are advancing VET into new areas (e.g., sustainable fashion, offshore wind energy) while fostering cross-sectoral and international approaches. By embedding micro-credentials, modular training, and cross-border collaboration, CoVEs demonstrate how vocational excellence can be systematised rather than fragmented. Their transnational approach, peer learning, and policy linkages highlight the potential of CoVEs to act as long-term catalysts for VET reform, enhancing competitiveness, inclusiveness, and resilience across Europe and beyond.

Methodology

The methodology for this analysis was designed to ensure a balanced and representative sample of CoVE projects, combining sectoral diversity, thematic coverage, and geographical spread. To achieve this, 53 Erasmus+ CoVE projects funded between 2019 and 2023 were reviewed, and from this pool, 25 projects were carefully selected for an in-depth analysis. Projects from the 2024 Call were at the inception stage when this report was prepared and were therefore not included for review. An online workshop held in June 2025 gathered around 40 project coordinators, partners, and policy representatives to discuss CoVE success factors for building skills ecosystems, the sustainability of CoVEs beyond Erasmus+ funding, and their role in modernising national VET systems. Participants also reflected on the future potential of CoVEs in supporting EU skills and education strategies.

1. Introduction

1.1. Objective of the assignment

The objective of this assignment is to analyse the state of play of the Centre of Vocational Excellence (CoVE) initiative under the Erasmus+ centralised Key Action 2 (KA2), identify projects demonstrating strong results and impact on vocational excellence, and give advice on the further development of the initiative.

1.2. Background and policy context

The origins of the CoVE concept in Europe

Centres of Vocational Excellence (CoVEs) in Europe evolved as a response to long-standing challenges around the quality and responsiveness of vocational education and training (VET) and were first mapped in 2019 by a report commissioned by the European Commission[3]. This mapping exercise revealed that CoVEs had first begun to develop in EU Member States in the early 2000s, with the emergence of many different types of CoVEs each with its own structure, goals and mix of activities. Some CoVEs comprised networks implemented as part of government policy (e.g. the Netherlands' *Katapult network*, and France's *Campus des métiers et des qualifications*), whilst other CoVEs were found to be 'free-standing' VET providers that functioned as CoVEs, without necessarily being designated as such (e.g. the *Šolski center Nova Gorica* in Slovenia, and Omnia in Finland).

Notwithstanding their diversity, CoVEs had broadly common aims: to address sectoral, societal and/or regional skills needs by forming partnerships with a wide range of actors, by being part of wider regional and national development strategies and programmes, and by embracing innovation in VET. In short, 'vocational excellence' was found to involve 'going beyond what VET would normally be expected to do'[4]. Key success factors were found to be: reciprocal and mutually beneficial relationships with stakeholders, especially with tertiary or higher education and business/enterprise and innovation (the so-called 'knowledge triangle'); being firmly anchored into regional development,

[3] European Commission: Directorate-General for Employment, Social Affairs and Inclusion, *Mapping of Centres of Vocational Excellence (CoVEs)*, Publications Office of the European Union, 2019, **https://data.europa.eu/doi/10.2767/646482**

[4] *Ibid*, p. 59.

innovation and smart specialisation[5] frameworks that enables synergies among policies and actors ; and the integration of activities so that 'the sum is greater than the parts', especially by building reflexive relationships between VET provision and research.

Vocational excellence as a core component of the EU's skills and VET agenda

Since the publication of the mapping report, the implementation of vocational excellence strategies has become a core component of the EU's skills and vocational education and training (VET) agenda. Anchored in key EU frameworks – including the European Skills Agenda, the European Education Area, the 2020 Council Recommendation on VET, and the Osnabrück Declaration, and more recently the Union of Skills and the Herning Declaration – vocational excellence is increasingly recognised not merely as a quality benchmark, but as a driver of systemic reform and innovation in VET.

CoVEs are seen as 'the pillars of excellent vocational education in Europe'[6]. Over time, they have evolved from being providers of high-quality training to becoming strategic instruments for embedding excellence into governance structures, national policies and transnational cooperation frameworks. Their growing momentum reflects a shift towards a more integrated, future-oriented approach to VET – one that aligns skills development with regional innovation, social inclusion, and economic resilience across the EU.

Building on this evolving policy and practice landscape, the definition of vocational excellence shown in the following box has been elaborated.

[5] https://ec.europa.eu/regional_policy/policy/communities-and-networks/s3-community-of-practice/about_en

[6] https://employment-social-affairs.ec.europa.eu/policies-and-activities/skills-and-qualifications/skills-jobs/centres-vocational-excellence_en

What is Vocational Excellence?

Vocational excellence goes beyond high-quality training alone. It combines relevant, attractive and inclusive education and training with strong connections to the world of work and society.

It is a holistic learner-centred approach in which VET:

- is an integrated part of skills ecosystems, contributing to regional development, innovation, smart specialisation and industrial strategies;
- works in partnership with other education and training sectors, research institutions and businesses, strengthening knowledge exchange, learner mobility and internationalisation;
- equips learners with both occupation-specific and key competences through quality-assured provision;
- promotes inclusiveness by ensuring access to top-quality education for all learners, not only the most talented..

In this way, vocational excellence supports innovation, adaptability and sustainabilty, aligning VET with economic transitions and societal needs, while preparing individuals for high-quality employment and lifelong learning.

Elaborated from: https://employment-social-affairs.ec.europa.eu/policies-and-activities/skills-and-qualifications/skills-jobs/centres-vocational-excellence_en

The role of Erasmus+ funding for CoVEs

Key EU frameworks – including the European Skills Agenda, the Pact for Skills, the European Education Area, the 2020 Council Recommendation on VET[7], and the Osnabrück Declaration – consistently reference Vocational Excellence as a driver of systemic VET reform. Since 2025, the Union of Skills initiative and the Herning Declaration have reaffirmed the EU's commitments to Vocational Excellence, promoting the alignment of VET with evolving labour market needs and supporting transnational, lifelong, and sector-specific skills development across the EU to make VET more attractive, innovative and inclusive.

Within the framework of the EU strategies mentioned above, funding for transnational CoVEs has been made available under the Erasmus+ programme, which has supported 69 projects since 2019 to 2024 (including the pilot projects launched in 2019 and 2020) with the aim of contributing to transforming the VET landscape by fostering high-quality skills development that supports quality employment, lifelong learning, and responsiveness to demands in the labour market. This initiative also aligns with and aims to make contributions to broader

[7] Council Recommendation of 24 November 2020 on vocational education and training (VET) for sustainable competitiveness, social fairness and resilience 2020/C 417/01 https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=oj:JOC_2020_417_R_0001

EU priorities such as the Green Deal, [8] and industrial and SME strategies by equipping learners and workers with the skills needed for inclusive, sustainable economic transitions.

Funded under Erasmus+ as a centralised action, the CoVE projects operationalise the 2020 VET Recommendation and reflect Erasmus+ priorities in social inclusion, digital transformation, green skills, and youth engagement[9]. The initiative fosters "upward convergence" by bringing together institutions from both mature and emerging VET systems, encouraging mutual learning and shared innovation. Through collaboration with national, regional and local authorities, social partners, and VET providers, the CoVE initiative contributes to a truly European dimension of vocational excellence.

Significantly, Erasmus+ overlays another layer onto the patterns of CoVEs identified in the 2019 mapping study and mentioned above. It creates transnational networks of CoVEs by '*bring(ing) together existing CoVEs, or … linking partners from various countries, that intend to develop Vocational Excellence in their local context through international cooperation*'[10]. This constitutes an important development. In 2019, it was found that international cooperation was 'commonplace' and 'a priority' for CoVEs, reflecting their 'wider global perspective'. At the same time, engagement with transnational mobility schemes and projects varied, often being 'in the process of development' and examples of the development of transnational joint curricula were rare, being one of the most notable gaps in CoVE activities, highlighted by the study. 'Many CoVEs have international strategies and associated activities … but even those that are highly active, with many international projects, may not take the step into developing joint curricula'. In this context, Erasmus+ has had the potential to be a significant European added value, assisting in CoVE development within countries through less developed CoVEs learning from their more developed partners and supporting advanced CoVEs to further develop excellence, and pioneering more systematic transnational cooperation between CoVEs to address European skills needs in targeted sectors and occupations.

CoVE objectives and activities under Erasmus+

Under Erasmus+, 'CoVEs are expected to go far beyond simply providing a quality vocational qualification' by 'adopting a systemic approach through which VET institutions actively contribute to co-create "skills ecosystems", together with

[8] https://digital-strategy.ec.europa.eu/en/policies/digital-decade-policy-programme

[9] Since 2019, 69 CoVE projects have been funded under Erasmus+, including 12 pilot projects funded in 2019.

[10] https://erasmus-plus.ec.europa.eu/programme-guide/part-b/key-action-2/centres-vocational-excellence

a wide range of other local/regional partners'. They are to do this by developing and implementing activities in three related areas: teaching and learning; cooperation and partnerships; and governance and funding[11]. Typical activities under these three clusters are:

Teaching and learning: developing innovative curricula and qualifications for learners of all ages and abilities (in both initial and continuing VET – I-VET and C-VET) which are based on effective skills anticipation techniques and strong quality assurance mechanisms; developing opportunities for skills development at higher levels, and opening up pathways into tertiary education; introducing teaching and learning that are learner-centred, flexible and enhance individualisation in learning; investing in teachers' and trainers' professional development.

Cooperation and partnerships: activities that catalyse local business development and innovation, by establishing partnerships between business and education and training to support teaching and learning and working closely with companies – in particular SMEs – and higher education institutions (HEIs) on applied research projects as well as co-creating innovation hubs and technology diffusion centres, and enabling entrepreneurial skills development; promoting awareness and raising the attractiveness of VET; developing the internationalisation of VET.

Governance and funding: actively engaging in national and regional skills governance systems and co-creating skills ecosystems; developing the autonomy of VET providers (within national parameters) to act flexibly with local partners and involving wider stakeholders in governance; developing sustainable financial models and making full use of national and EU financial instruments.

1.3. Scope of the analysis

This report presents an analysis based on evidence from a selection of 25 CoVE projects out of the 53 funded under Erasmus+ covering the project calls 2019 to 2023. Projects from the 2024 Call were excluded from the sample as they were not yet mature enough for analysis. It explores the design and implementation of partnership models, the development of training programmes and qualifications, innovation-oriented activities, and the potential for sustaining these initiatives over time. The analysis further identifies key factors that support the long-term sustainability and scalability of project outcomes, such as strong institutional commitment, active stakeholder engagement, and alignment with regional and national strategies.

[11] https://erasmus-plus.ec.europa.eu/programme-guide/part-b/key-action-2/centres-vocational-excellence

2. Methodology

2.1. Screening of project data and selection of case studies

The process for screening and selecting the case studies began with the review of the 53 CoVE projects funded under the Erasmus+ programme for the project annual calls 2019-2023, with the 2019 and 2020 calls relating to pilot CoVE projects. Projects from the 2024 Call were excluded from the screening and selection process as they were still at the inception stage and not mature enough for analysis.

The following sources were used:

- The factsheets of the 38 CoVE projects from the 2019-2022 Erasmus+ KA2 calls and the 15 CoVE projects from the 2023 call, compiled by the European Commission. Special attention was given to the summaries of the projects' objectives and deliverables
- The Erasmus+ database of projects and the EU Funding & Tenders Portal.
- The individual websites of the 53 CoVE projects for the 2019-2023 annual calls. The screening focused on the availability of:
    - results presented in analytical report format, as an indication of the extent of detailed information readily provided
    - contact details of individuals with defined roles within the CoVE projects to facilitate the interview process.
- Annual Erasmus+ work programmes for the period 2019-2023 to gather information on CoVE project calls, their focus, and the minimum number of activities across three key activity clusters - Teaching and learning; Cooperation and partnership; Governance and funding - for funding eligibility.

The screening process involved the extraction of data from the above sources. This process was semi-automated using Artificial Intelligence (AI) methods such as Natural Language Processing (NLP) to assess the extent of the projects' relevance to the thematic scope of the study. The extracted information was then reviewed and cleaned by analysts.

The sources were assessed based on their relevance to specific topics and corresponding keywords:

- **EU-level strategic objectives:** 'Green Transition', 'European Green Deal', 'Environmental Sustainability', 'Digital Skills', 'Digital Strategy',

'Industrial Strategy/ SME Strategy' 'Inclusion' (of groups with 'Fewer Opportunities'), 'Lifelong Learning'

- **Vocational Excellence:** 'Skills Ecosystem', 'Knowledge Triangle', 'Quality Assurance', 'Innovative Partnership' (between VET and the world of work), High-Quality Training.
- **Complementarity with other relevant EU instruments:** 'Net-Zero Industry Academies (NZIAs)', 'Pact for Skills', 'Blueprint Alliances' (for Sectoral Cooperation on skills)

A data extraction matrix was developed to capture relevant information from the identified sources and to support the subsequent selection of case studies (see Annex 1).

Information for each of the 53 CoVE projects was extracted using the matrix, which also served as a factsheet for each project.

Selection criteria were then developed manually and applied to identify a list of 25 CoVE projects for in-depth analysis and case study development.

To ensure a balanced and representative sample, the selection of CoVE projects for case study research was performed using the following criteria in order of importance:

- Geographical balance – includes CoVE typology coverage
- Project maturity
- Topics and sectoral coverage – including coverage of strategic themes and activity clusters
- Target groups

Geographical balance and representation of all CoVE types

The selection included all countries with at least one CoVE project coordinator. By ensuring the inclusion of underrepresented regions, such as Southeastern Europe and non-EU countries associated to the Erasmus+ programme (e.g., North Macedonia, Norway), the selection aimed to assess CoVEs' contributions to enhancing the quality and attractiveness of VET across the widest possible range of diverse countries.

The geographical balance in the selection also considered the CoVE typology, as outlined in the Mapping of Centres of Vocational Excellence study[12], ensuring

[12] European Commission: Directorate-General for Employment, Social Affairs and Inclusion, *Mapping of Centres of Vocational Excellence (CoVEs)*, Publications Office of the European Union, 2019, https://data.europa.eu/doi/10.2767/646482

that all CoVE types are represented in the sample. This includes purpose-built or designated CoVEs, often comprising networks of CoVEs covering sectors and/or regions (e.g., Belgium, France, and the Netherlands) as well as individual VET providers functioning as CoVEs for a sector and/or region (e.g., Austria, Germany, Spain, Finland, and Italy).

Table 1 – Coordinating countries – geographical representativeness

Coordinating Country	Number of projects	Included in the sample
Austria	2	1
Belgium	4	2
Bulgaria	2	1
Croatia	1	1
Denmark	4	2
Finland	3	1
France	2	1
Germany	4	1
Greece	7	2
Italy	4	2
Netherlands	6	3
North Macedonia	1	1
Norway	2	1
Portugal	1	1
Romania	2	1
Slovakia	1	1
Slovenia	2	1
Spain	4	1
Sweden	1	1
Total	**53**	**25**

Source: ICF.

Project maturity

The projects' degree of completion and programming period were considered to ensure sample quality.

The selection of projects took into account their status, i.e., whether they are ongoing or have been completed. Among the 53 CoVE projects initiated between 2019 and 2024, 12 were completed and 41 ongoing at the time of the assignment. As shown in Table 3, the sample included just under half of the completed (5 of 12) and ongoing projects (20 of 41).

The selection also ensured a balanced distribution of projects across start years, corresponding to the annual calls from 2018–19 to 2023–24. While the sample was weighted towards more mature projects to enhance the likelihood of capturing outcomes and results, recently launched CoVE projects were also included to provide insights into the processes of establishing CoVE structures.

Table 2 – Programming period and start year

Programming period (Status)	No. of projects	Included in the sample	Start year	No. of projects	Included in the sample
2014-2020 (Completed)	12	5	2019	4	1
			2020	8	4
2021-2027 (Ongoing)	41	20	2021	-	-
			2022	13	8
			2023	13	7
			2024	15	5
Total	**53**	**25**			

Source: ICF.

Topics and sectoral coverage

The projects selected represented a wide coverage of topics and sectors while reflecting horizontal Erasmus+ themes and key strategic themes for VET excellence.

To ensure sectoral topic representativeness, a balanced sample of project topics was grouped into broader sectors based on the European Commission's factsheets [13] . The selection aimed to cover as many diverse topics as possible across the various sectors in which CoVEs are active.

Table 3 shows the sectors and topics represented in the sample of CoVE projects.

Table 3 – Sector and topic coverage

Sector(s)	No. of CoVE projects	Included in the sample	Coordinating countries	Topic(s)
Green transition	12	4	DE, NL, PT, Norway	Green Economy
				Sustainable energy
				Offshore renewable energy
				Urban greening

[13] For the 2019-2022 calls: https://ec.europa.eu/social/BlobServlet?docId=27311&langId=en ; For the 2023 call: https://ec.europa.eu/social/BlobServlet?docId=27552&langId=en

Sector(s)	No. of CoVE projects	Included in the sample	Coordinating countries	Topic(s)
Transport industry, business services	7	5	AT, BE, EL, FI, North Macedonia	Aerospace and Defence
				Automotive
				Mobility value chain
				SME
				Tourism
Digital transition	7	4	BE, BG, HR, SK	Artificial Intelligence (AI)
				Cloud and mobile tech
				AI, Virtual Reality (VR)
				Microelectronics
Manufacturing	6	2	SE, SI	Advanced Manufacturing
				Manufacturing
Arts & Cuture	3	2	EL, FR	Arts & crafts
				Fashion
Agriculture	5	2	DK. IT	Agriculture
				Dairy agriculture
Health	2	2	DK, NL	Healthcare
				Health Tech
Social VET	6	2	IT, RO	Social dimension
				Social inclusion
Construction & Habitat	2	1	ES	Habitat
Water	3	1	NL	Water Scale-up
Total	53	25		

Source: ICF.

Thematic coverage

When selecting the sample, CoVE projects were prioritised based on their alignment with horizontal Erasmus+ themes and key strategic themes for VET excellence.

The coverage of key strategic themes was closely linked to that of sectors and topics. Taking this into consideration, the data screening exercise was able to extract information for most projects.

This exercise played a role in guiding project selection. The completeness of the secondary data screened and extracted at this initial stage indicates how thoroughly projects reported information. In turn, this helped predict how easily in-depth information could be gathered from both secondary and primary sources for analysis. As such, projects with little initial information across several themes were left out of the sample.

The data screening and extraction revealed that all projects contained information on CoVEs' integration into Skills Ecosystems and Innovative Partnerships. Likewise, all but two projects included details on their integration into Knowledge

Triangles; these two were excluded from the sample. However, information on other themes was more frequently missing, making it necessary to ensure a balanced representation. To address this, the project selection aimed to include a diverse range of themes

Table 4 –Thematic coverage – based on initial data screening and extraction

Theme	No. of projects with information	No. of projects in the sample
Integration into Skills Ecosystems	53	25
Innovative Partnerships	53	25
Integration into Knowledge Triangles	51	25
Industrial / SME strategy	49	23
Digital skills	48	22
Green transition / environmental sustainability	45	20
Quality assurance in teaching	43	20
Inclusion (of groups with fewer opportunities)	32	18

Source: ICF.

Target groups

The selected sample considered the extent to which the projects reached various target groups, ensuring their inclusion in a representative and balanced way.

This sampling was based on initial data extracted from the screening exercise, which showed a variety of descriptions as to the groups targeted by the VET projects. The sampling approach for target groups focused on ensuring the representation of diverse learner types and learning formats (I-VET, C-VET, Adult Learning, and Work-Based Learning), thereby covering the widest possible range of EQF levels. The target groups serve to some extent as an indication of the nature of the CoVE projects, with some being more business-oriented than others, and some having more of a pedagogical or social element, depending on the sectors.

Table 5 presents the most frequently identified target groups based on the initial data screening and extraction.

Table 5 – Target groups covered – based on initial data screening and extraction

Target group	No. of projects with info on target group	No. of such projects in the sample
Companies, SMEs, employer organisations	34	18
Learners and students at all levels	29	14
VET students EQF levels 3-5	*13*	*7*
VET students EQF levels 6-8	*8*	*3*
Adult learners, jobseekers, low-skilled	*8*	*4*
Professionals and skilled workers	19	10
Educators, trainers, VET providers	18	11
Policymakers at various levels of governance	11	8

Source: ICF.

Selection of the case studies

The above criteria and information were used in the selection of CoVE projects as case studies, following review and approval by DG EMPL. The final case study selection is shown in Table 6.

Table 6 – Final case study selection (in alphabetical order)

CoVE	Coordinating country	Call year	Project status
3LoE - Three-level Centers of Professional Excellence: Qualification, Entrepreneurship and Innovation in the Green Economy	Germany	2019	Completed
AEDIL-dairy-CoVE - European Excellence in Dairy Learning	Denmark	2021	Ongoing
AGRIFOOD4FUTURE - Centres of Vocational Excellence in Smart Farming and Sustainable Food Systems	Italy	2022	Ongoing
AI4VET4AI - AI-powered Next Generation of VET	Croatia	2022	Ongoing
AILEEN - centres of vocAtIonaL Excellence in aErospace & defence for advanced maNufacturing	Belgium	2022	Ongoing
Auto-Cove 2.0 - Greening Europe with support of Clean-tech-vehicle education	Finland	2022	Ongoing
CARE about IT	Netherlands	2022	Ongoing
CATALYST - European VET Excellence Centre for Leading Sustainable Systems and Business Transformation	North Macedonia	2021	Ongoing
EE4M - Engineering Excellence for the Mobility Value Chain	Austria	2022	Ongoing

CoVE	Coordinating country	Call year	Project status
EULEP - European Learning Experience Platform - Connecting Centres of Vocational Excellence to develop and deliver innovative transnational C-VET training in AI, VR, social innovation	Belgium	2021	Ongoing
ECoVEM - European Centre of Vocational Excellence in Microelectronics	Bulgaria	2020	Completed
EPLUG - European Platform for Urban Greening	Netherlands	2020	Completed
EUVECA - European Platform for Vocational Excellence in Health Care	Denmark	2021	Ongoing
FEA-VEE - Fashion Earth Alliance – Vocational Excellence and Enterprise united for training, policy reform and sustainability in the fashion, textiles and apparel industries	Greece	2021	Ongoing
GIVE - Governance for Inclusive Vocational Excellence	Italy	2020	Completed
H2COVE - Hydrogen Centres of Vocational Excellence	Norway	2023	Ongoing
HABITABLE - Alliance of Centres of Excellence in Vocational Training for Sustainable Habitat	Spain	2022	Ongoing
INVESTech - Innovation Vocational Excellence in Tech	Slovakia	2023	Ongoing
MOSAIC - Mastering job-Oriented Skills in Arts & crafts thanks to Inclusive Centres of vocational excellence	France	2021	Ongoing
PoVE Water Scale-up - Platform of Vocational Excellence Water Scale-up	Netherlands	2021	Ongoing
PROMOTE - Promoting Integrated Professional Development for Prison Practitioners in Vocational Excellence for Offender Reintegration	Romania	2023	Ongoing
SHOREWINNER - Southern European Community for Offshore Wind Energy	Portugal	2023	Ongoing
Talentjourney - Platform for CDS VET Excellence	Slovenia	2019	Completed
TOUR-X - CoVEs for the Tourism Industry	Greece	2021	Ongoing
VOLTAGE - Vocational Training for Optimal Learning and Growth in the European Battery Industry	Sweden	2023	Ongoing

Source: ICF.

2.2. In-depth data collection and analysis

This task comprised two complementary elements. All relevant secondary information from project websites was gathered to provide information on activities and results; and in addition interviews were conducted with project participants to cover topics such as challenges, lessons learned, and insights into

project effectiveness, both to gather information on issues which are not typically captured in project records and to enable topics relevant to the assignment to be probed in depth. This combination also enabled information to be cross-checked.

These tasks were undertaken sequentially in a two-step process so that information could be gathered initially to inform the round of interviews, as follows.

The first step involved gathering, extracting, and analysing all relevant **secondary information** from the project to enhance the inventory data with more detailed descriptions and analytical insights. Specifically, the following sources were reviewed:

- CoVE project websites: dedicated websites/online platforms on the selected Erasmus+ projects, and their updates, publications, and reports providing in-depth insights into project activities and outcomes, as well as evidence to support sustainability and results beyond Erasmus+ funding.
- CoVE project reports – including interim and final reports and evaluation documents for the completed projects – providing information about methodologies, results and outputs.

The second step involved collecting **primary data** through **semi-structured interviews** with project stakeholders, including project coordinators from lead organisations and project partners representing various stakeholder groups (e.g., education and training institutions, private companies, sector organisations, social partners, ministries, regional and local authorities).

To facilitate this, a standard topic guide questionnaire was developed and tailored to each CoVE project's specific context and the extent of information available from desk research.

The topic guide questionnaire (see Annex 2) contained descriptive and process-related questions designed to fill gaps in the information that could not be obtained through desk research; and to seek project stakeholders' insights into the outcomes of their CoVE project regarding:

- The nature of skills-focused activities
- The nature of programmes and qualifications developed in relation to those skills
- How the project may have enhanced the quality and attractiveness of VET
- Added value generated
- The potential for sustainability, scalability and transferability

Up to five interviews per case study were foreseen. The interviews gave priority to the project coordinators from lead organisations, who were then instructed to nominate consortium partners representing different stakeholder groups (e.g.,

VET schools, research institutes, business associations regional governments, civil society organisations) to take part in the interviews.

2.3. Development of the case studies

The 25 case studies were developed using information gathered from project documentation, other relevant secondary sources, and the interviews with CoVE project stakeholders. This information was then triangulated. The case study reports (published in a separate annex) are a core input for the analysis presented in this report. The report template was based on the project extraction data matrix (see Annex 1) and the structure of the topic guide questionnaire (see Annex 2).

Case study report template

1 About the CoVE project

1.1 Background information
Project name; project duration; call year; project status; coordinating and partner organisations and countries covered)

1.2 Objectives of the CoVE

2 Activities of the CoVE and skills developed

2.1 Activities covered
Focus on the three clusters – 1) Teaching and learning; 2) Cooperation and partnerships; 3) Governance and funding – and on the types of partners involved and their contributions to the activities.

2.2 Skills developed

3 Results of the CoVE

3.1 Contribution to the development of qualifications
3.2 Contribution to enhancing the quality and attractiveness of VET

4 Success factors

4.1 Added value of the CoVE
4.2 Potential for sustainability, scalability and transferability

5 Overall impact and lessons learnt

Sources

2.4. Online workshop

A workshop with CoVE project coordinators, partners, and policy stakeholders at the EU and national levels was held on 5 June 2025, with around 40 participants. The outcomes of this workshop contributed to the analysis presented in this report.

The workshop provided an opportunity for CoVE project coordinators and partners to share reflections and experiences from the field. They offered insights and contextual commentary on the notion of VET excellence, relating it to their own work and perspectives. Based on their own experiences, the invited CoVE representatives were asked prior to the online workshop to prepare up to three short statements on the following points:

- Success factors and challenges of building skills ecosystems and bringing them together in well-functioning transnational partnerships,
- Ensuring sustainability or continuity of projects activities and results post Erasmus+ funding
- Influencing the development/modernisation/reform of VET systems in their respective countries and across the EU (including through engaging and working with public authorities and companies)
- Looking forwards: reflections on the potential of CoVEs in the future

Interactive polling was used to collect further insights during the workshop to complement the evidence. The agenda for the workshop is presented in the following box.

Contributions of the Erasmus+ CoVE initiative to Vocational Excellence in the EU, Online Workshop, Thursday 5 June 2025, 10.30-13.00 CEST

10.30 – Welcome and introductions, *opening statements from Anna Banczyk, DG EMPL*

10.45 – Observations from the project team *drawn from the CoVE case studies*

11.00 – Reflections from the field I

- Q1: What are the success factors and challenges of building skills ecosystems? What valuable inputs do different stakeholders make, including teachers and learners?
- Q2: What does “vocational excellence” mean for you and how do CoVEs contribute to it?
- Q3: How do CoVEs contribute to preparing the VET Systems to respond to economic megatrends?
- Q4: To what extent are CoVEs contributing to the recognition and transparency of VET skills?

12.00 – Reflections from the field II, *opening statements from Beata Dziemińska-Skowron of the Polish Ministry of Education, representing the Polish Presidency of the European Council*

- Q5: How can CoVE inform future policy design at national level?
- Q6: What factors are driving (or limiting) the sustainability and scalability of CoVEs and their results? How can we reap the full potential of the CoVE initiative for the future?

12.40 – Closing reflections and the way forward, *closing statements from Anna Barbieri, DG EMPL*

2.5. Analysis and reporting

As previously mentioned, the information presented in this interim report is based on case studies of 25 CoVE projects and is complemented by the outcomes from the online workshop.

The report aims to present the key achievements of the CoVEs, as well as the challenges they have faced, structured around a thematic comparative analysis.

The thematic and comparative analysis was **semi-automated** and focused on the development of **analytical themes**.

Textual data were extracted from the case studies documenting the activities of the CoVEs. A **coding framework** was developed, including predefined themes, theme descriptions, and associated keywords. Embeddings, or numerical representations of text capturing semantic meaning by converting text into a series of numbers (or vectors) that reflect the underlying meaning of the words and phrases, were generated for case study report sections and theme keywords. These embeddings enable semantic search, allowing for the extraction of relevant excerpts based on specific themes. Relevant excerpts identified through semantic search were grouped by CoVE and theme to provide structured input for a large language model[14] (LLM). For each theme, the LLM was prompted to summarise the situation of individual CoVEs and highlight cross-cutting patterns. The prompt design ensured consistency in the type of insights generated across themes and cases. Iterative refinement of prompt wording was carried out during early testing stages.

The large language model produced narrative summaries for each theme, comparing the situation across CoVEs. The analysis highlighted best practices, recurring challenges, and cross-cutting patterns, offering a comparative perspective on how different CoVEs addressed each thematic area.

The textual analysis produced then underwent thorough verification which involved reviewing the findings against the authors' source materials, including interview transcripts and secondary sources, as part of the **triangulation** process. The findings were reviewed and expanded on where needed via this process. Where relevant, the analysis was complemented with findings from the online workshop.

[14] An LLM is an advanced Artificial Intelligence (AI) system trained to understand and generate human language.

3. Main findings

The main findings are based on the key themes covered in the case study reports (included in a separate annex to this report) and cover the following areas:

- Processes, including the roles and contributions of project partners across CoVE activity clusters.
- Partnership development approaches in the context of CoVE, with a particular focus on collaboration between the VET and higher education sectors.
- Skills development activities focused on designing training programmes that respond to labour market needs, support the shift towards digitalisation and the green transition, and align with relevant EU competence frameworks, with particular emphasis on innovative teaching and learning approaches.
- Outcomes relating to the development of qualifications, covering curricular integration of the skills training programmes developed, their alignment with EQF, and the extent to which they are recognised for inclusion in NQFs.
- Outcomes regarding the enhancement of VET quality and attractiveness, with emphasis on the concept of vocational excellence, and the contribution of CoVEs to this objective,
- The extent of CoVEs alignment with and contribution to national VET excellence strategies and relevant EU policy initiatives.
- Success factors, focusing on the overall added value of each CoVE, and their potential for sustainability, scalability, and transferability.

3.1. Roles and inputs of project partners in CoVE activities

This section examines the processes underpinning the implementation of CoVE projects, with a focus on the roles and responsibilities of different partners within and across the three key Erasmus+ CoVE activity clusters: Teaching and Learning (Cluster 1), Cooperation and Partnerships (Cluster 2), and Governance and Funding (Cluster 3). Particular attention is given to partnership formation approaches and strategies for collaboration between the VET and higher education (HE) sectors, in the interest of creating smoother learning pathways between VET and HE while improving skills alignment with labour market needs and supporting lifelong learning opportunities.

Across the CoVE projects reviewed, multi-stakeholder collaboration emerges as a defining feature. Typical partners include VET providers, higher education institutions (HEIs), industry actors, chambers of commerce, public authorities, and civil society organisations. While partner roles vary by sector and region, they tend to follow consistent functional patterns.

3.1.1. Teaching and learning activities

Teaching and learning activities are **led primarily by VET providers and HEIs**, often in collaboration with industry. Their responsibilities include curriculum design and pedagogical innovation, often involving the development learner-centred approach within dual education and apprenticeship programmes. Many CoVEs illustrate best practices in **integrating labour market intelligence (LMI) into training provision**.

Pedagogical innovation and curriculum development

Across CoVEs, VET providers and HEIs drive pedagogical innovation through curriculum development and the implementation of new training modules. CoVEs such as **3LoE**, **AI4VET4AI** and **AILEEN** highlight their role in designing dual education programmes and train-the-trainer activities, with HEIs contributing to the development of advanced-level training that bridges vocational education and training and academic education.

Cooperation between VET providers and HEIs is also instrumental in the development of learner-centred methodologies for dual education programmes, including apprenticeships, that address labour market needs. To illustrate this, **EcoVEM** highlights the creation of flexible learning pathways and active involvement of VET students and teachers in research, supported by HEIs. **Auto CoVE 2.0** provides another example of this with its biannual Collaborative Development Workshops, where secondary school teachers, university lecturers, and industry professionals co-design and test teaching materials in a cyclical process of delivery, feedback, and refinement, informed by studies on teaching methods. The **GIVE** project also highlights the complementary roles of HEIs in providing advanced training modules and ensuring academic quality, thus enhancing the overall educational experience. Similarly, professional development in VET was central to the **Talentjourney** pilot project, which featured targeted train-the-trainer programmes for the digital and pedagogical upskilling of VET teachers, achieved through the co-creation of innovative learning materials with both academic and industry experts.

In summary, the involvement of tertiary or higher education in CoVEs contributes to teaching and learning innovation by integrating academic expertise with practical training and fostering learner-centred pathways.

Labour market intelligence steering teaching and learning activities

A consistent trend across the CoVEs is the integration of robust **labour market intelligence** (LMI), in particular at regional and local level, into teaching and learning activities. In nearly all CoVEs described, LMI forms the foundation for developing training content that aligns with current and emerging industry needs. This intelligence is typically derived through a combination of methods: surveys, interviews, needs assessments, stakeholder consultations (especially with employers), and desk research. By prioritising the identification and anticipation of skills needs, CoVEs are able to swiftly develop and implement targeted training programmes that respond to emerging economic and technological developments. This ensures alignment between education and training provision and labour market needs, particularly in the context of the green and digital transitions.

The **EULEP** CoVE exemplifies this strategy through its structured Market Analysis phase, which underpins the development of training content. The process is grounded in extensive labour market research, including a business survey disseminated by Chambers of Commerce and Industry (CCIs), ensuring that the resulting materials address both digital transformation imperatives and regionally relevant, occupation-specific skills needs. EULEP's methodology follows a bottom-up and end-user-centred approach, enhancing responsiveness and practical relevance.

Similarly, the **HABITABLE** CoVE, focusing on the habitat sector[15], has developed the SMART Skills Intelligence Platform (SMART SIP), a digital ecosystem designed to continuously map, analyse, and monitor labour market dynamics. With tools such as SMART Info, a Sector Map of Jobs and Skills, and a Training Offer Panel, the platform aims to facilitate a more effective match between training provision and labour market demand. It serves policymakers, education and training providers, and employment services by delivering timely insights into evolving skill requirements, particularly those linked to sustainability and digitalisation.

In the **AILEEN** CoVE, market analysis and surveys of industry stakeholders has served to identify gaps in current training provision to then develop industry-relevant content in Additive Manufacturing (i.e. 3D printing, including applications in aerospace), ensuring alignment with both technological standards and employer expectations.

AGRIFOOD4FUTURE has applied LMI to design a range of programmes across various EQF levels, from smart farming technician training to transnational

[15] The habitat sector integrates a wide group of professional occupations from the sectors of infrastructure construction, housing and installations, activities related to wood and furniture manufacturing, home textiles, electricity and lighting installations, etc.

master's degrees. This has involved conducting sectoral surveys to identify gaps in precision farming and regenerative agriculture, ensuring that learning content reflects the immediate and evolving needs of the agri-food sector.

TOUR-X conducted a multi-country skills gap analysis of tourism VET programmes, assessing strengths, weaknesses, and improvement areas. The analysis highlighted the need for better alignment with industry demand, focusing on digital skills, customer service, sustainability, and leadership. Gaps were addressed through occupation-specific training in hospitality management and travel operations (EQF 3–7), plus transversal skills. Innovative hospitality labs, co-developed with employers, provide practical, relevant training aligned to sector standards.

EUVECA has performed a multi-country healthcare needs assessment involving 3,600+ students and professionals, supplemented by interviews and literature review. The findings prioritised 21st-century skills (communication, collaboration, critical thinking, leadership), ICT literacy, and climate-related competencies.

The **SHOREWINNER** CoVE conducted a comprehensive cross-country analysis of knowledge and skills gaps in the offshore wind sector. This enabled the consortium to design a curriculum that is responsive to both current workforce shortages and future sectoral developments, while fostering stronger links between education and training and industry actors.

The **INVESTech** CoVE undertook a multi-method needs assessment across five countries, combining desk research, focus groups, and stakeholder interviews. This analysis identified critical shortages in ICT talent, particularly in advanced fields such as Artificial Intelligence, blockchain, and quantum computing. It also highlighted the need for professionals who possess both deep technical knowledge and transversal skills, reinforcing the importance of interdisciplinary approaches to skills development. At the EU level, the project pointed to the need for stronger research capacity and deeper collaboration between education and training institutions and industry.

The **H2CoVE** initiative adopted a methodologically rigorous approach, combining three years of job vacancy data analysis with stakeholder interviews across the hydrogen value chain and validation workshops with industry representatives. This comprehensive evidence base has informed a training framework now being adapted by other regions to suit their local contexts, highlighting the replicability of the methodology.

In **Talentjourney**, labour market foresight and intelligence studies formed the backbone of training programme design. The resulting curricula are closely aligned with future skills needs in smart manufacturing and internet of things (IoT), reflecting the project's commitment to equipping learners for a rapidly evolving industrial landscape.

Importantly, several CoVE examples show that systematic LMI is not only central to the CoVE model but also instrumental in ensuring that teaching and learning activities are agile, sector-relevant, and future-proof. In addition, CoVEs generate comparable insights across multiple partner countries that capture both common trends and region-specific demands, enabling the alignment of training content across borders. Regular VET–business dialogue and co-creation workshops, where learners, educators, and industry jointly define emerging needs, ensure that LMI reflects relevant skill requirements and supports a dynamic match between supply and demand in the various local and regional contexts covered by the projects. This transnational approach not only enriches the evidence base for VET policy but also enhances the adaptability and relevance of programmes in rapidly evolving labour markets.

3.1.2. Cooperation and Partnership activities

Activities relating to Cooperation and Partnerships overall highlight **the dynamic collaboration between education and training institutions, industry partners, and policymaking organisations**. Business and industry stakeholders typically contribute by identifying labour market needs, hosting learners, co-developing curricula, and supplying practical training environments. These activities are also characterised by the development of skills ecosystems, through cooperation and knowledge exchange, embedding VET within sectoral and regional innovation ecosystems. Such practices ensure that teaching content remains labour market-relevant while ensuring engagement from policy stakeholders.

Transnational network leverage and policy influence

Some CoVEs demonstrate how transnational cooperation brings added value and knowledge that cannot be generated at the local level alone.

TOUR-X, with its focus on the tourism industry, illustrates how pre-existing networks can be leveraged to engage sectoral stakeholders and regional authorities and influence policy, enabling cooperation to scale beyond training delivery and into policy impact.

The **INVESTech** CoVE has strengthened cooperation in the ICT sector through international partnerships pooling expertise and addressing gaps in specialised training. These cross-border collaborations have further supported innovation diffusion and policy influence in the sector. At the same time, it has identified persistent training gaps that require transnational solutions to overcome local expertise shortages. It also stresses the need for closer alignment with national recognition frameworks to facilitate the wider uptake of transnational training offers.

Building sector ecosystems and knowledge triangles

As previously noted, CoVEs bring together stakeholders from education and training, business, research, and public authorities, pooling their knowledge and insights around a shared mission to foster innovation in learning and enhance the responsiveness of VET to labour market demands, sectoral priorities, and regional economic development.

AI4VET4AI and **AILEEN** exemplify this approach: both co-design curricula and apprenticeships with companies, embed applied research directly into training, and involve certification bodies to ensure recognition of new qualifications. **AILEEN** integrates industry-driven research challenges into learning content, creating a full-cycle model that links knowledge generation with its delivery and validation. **AI4VET4AI** links VET excellence in Artificial Intelligence (AI) with industry, research, and regional policy priorities. Anchored in regional smart-specialisation strategies, it identifies AI-related skills gaps in sectors such as healthcare, tourism, agriculture, business management, and smart cities, and translates these insights into practical training solutions including modular Massive Open Online Courses (MOOCs), teacher-training materials, 11 AI-VET campuses, and 7 VET incubators. This approach ensures responsiveness to local labour-market needs while enabling cross-border collaboration and knowledge exchange.

PoVE Water Scale-up establishes hybrid learning environments where companies co-deliver education and training, providing equipment, practical industry cases, and workplace learning. This partnership approach is particularly innovative. Educators become facilitators, co-creating cutting-edge and highly contextualised learning experiences in partnership with the companies involved This model integrates workplace realities into VET, while also making training more accessible and inclusive by exposing learners to authentic industry contexts.

AGRIFOOD4FUTURE adds another dimension by establishing open innovation test farms, which serve simultaneously as training environments and policy pilots. This approach integrates innovation and training into regional agri-food systems while also feeding into agricultural policy development, showing how the knowledge triangle can extend beyond education and training and business to inform regional strategies.

Several other CoVEs (e.g., **AI4VET4AI**, **SHOREWINNER**, **EUVECA**, **EE4M**, **3LoE**) build knowledge triangles by linking VET providers, HEIs, industry, and public authorities in innovation-driven networks with stable governance, fostering stakeholder ownership and labour market–relevant skills.

Inclusive and specialised cooperation

Cluster 2 activities also reveal how cooperation can promote inclusiveness and respond to specialised sectoral needs.

The **GIVE** project is notable for its inclusive partnership model, bringing together VET providers, employers, HEIs, and civil society organisations to co-create curricula, pedagogical tools, and services tailored to disadvantaged learners. By engaging public authorities, NGOs, and businesses in designing education and training pathways and transition-to-work models, the project ensures relevance and inclusion. HEIs also contribute applied research on inclusive methodologies, embedding these approaches in teacher training. This collaborative model enables GIVE to remain agile and proactive in mobilising resources to meet diverse learner needs.

The **EULEP** CoVE's inclusive approach to cooperation and partnership embeds bottom-up, end-user-centred methods into its activities. Through surveys, consultations, and the active involvement of chambers of commerce, the project ensures that education and training pathways are shaped by the voices of local stakeholders, including smaller businesses and workers. This emphasis on broad participation not only aligns provision with local realities but also strengthens equity and accessibility within the regional skills ecosystem.

The **Care about IT** CoVE demonstrates how inclusive cooperation can be built into partnership development while tailoring models to regional contexts. Each partner country follows a common partnership structure linking a VET school and a university of applied sciences with care sector organisation such as elderly care homes, hospitals, and health tech companies. This ensures that diverse stakeholders, from education and training providers to frontline care institutions, contribute to shaping training provision. In Italy, one of the partner countries, inclusiveness is reinforced through strong collaboration with the regional government, which validates the healthcare assistance course and enables regional adaptation within a national framework. Care about IT also promotes inclusion by engaging regional actors in co-creating a healthcare technology skills ecosystem, ensuring that innovation meets both professional and community needs.

3.1.3. Governance and Funding activities

Governance and Funding activities are overall described as focusing on **co-creating skills ecosystems and leveraging resources for growth**. A structured governance is vital for the partnerships, particularly for decision-making, problem solving, building trust, sustainability, and accountability.

Strategic multi-level governance and diversified funding

Several CoVE examples highlight governance models that integrate and operationalise education and training, industry, and policy aspirations.

The **AI4VET4AI** CoVE's governance and funding model relies on partners' strategic integration of AI-related training into their core offerings. Future funding – particularly for AI incubators and VET campuses – is to be generated from blended sources, including regional and national innovation funds as well as public–private partnerships, supported by active engagement with public authorities to align project activities with regional development and workforce priorities.

The **SHOREWINNER** CoVE combines regional and transnational approaches, embedding training into official VET and HE curricula supported by public education funds and the active involvement of regional authorities. This engagement supports governance by bringing energy policy expertise into VET and promoting the dissemination of innovative practices. The CoVE also explores blended funding options, including public–private partnerships such as Italy's 'interprofessional funds', which channel payroll levies into accredited VET training aligned with labour market needs and delivering mutual benefits for learners, providers, and employers. Financial transfers within the consortium not only ensures timely project delivery but also act as a mechanism to build trust and strengthen cooperation among international partners. SHOREWINNER thus demonstrates how CoVEs can align governance and funding models with regional strategies while fostering durable public–private collaboration.

The **EUVECA** CoVE exemplifies a multi-level governance model built on advisory boards and steering committees that engage a wide range of stakeholders. This structure is particularly effective in sectors such as health and social care, where strong regulatory oversight and public authority involvement are essential. A key strength of the project is its recognition of the need to embed both funding and governance mechanisms into national and regional strategies to ensure long-term sustainability and secure the engagement and financial support of public authorities. EUVECA thus serves as a strong example of how CoVE initiatives can align governance and funding models with broader public policy and institutional frameworks.

The **EE4M** CoVE governance leverages regional VET platforms, engaging education and training institutions in decision-making and long-term curriculum planning. Its funding combines national system and industry contributions, with companies shaping content through consultations, projects, and train-the-trainer programmes, enhancing adaptability, relevance, and sustainable impact in line with evolving technological and labour market needs.

The **3LoE** CoVE strengthened its sustainable governance and funding by integrating more than 70 partners – ranging from companies and vocational

schools to sectoral associations – into its international network. This multi-tiered governance model has fostered broad buy-in across the green economy, ensuring that qualification frameworks, entrepreneurship initiatives, and innovation activities are co-created with those directly shaping the sector. As a pilot CoVE, 3LoE not only laid the groundwork for sustainable EU-wide impact but also built strong ownership among stakeholders. Overall, the project engaged 5,780 participants, including over 5,000 learners, teachers and trainers, and more than 500 companies, illustrating its capacity to align skills development with the needs and ambitions of the green transition.

Innovative and inclusive governance models

The **GIVE** CoVE provides a compelling example of an inclusive and entrepreneurial governance model. Partners co-designed a governance framework based on four pillars – mission alignment, multi-level stakeholder engagement, inclusive leadership, and resource mobilisation strategies – validated through peer review with external experts and policy stakeholders. The CoVE has also addressed sustainability by developing a policy roadmap to institutionalise inclusive practices at regional and national levels, including recommendations for adapting funding models (e.g., through public-private partnerships or social impact schemes) to support long-term VET provision for vulnerable groups. Its governance framework ensures that VET providers stay agile in meeting the needs of disadvantaged learners, while proactive resource mobilisation with a wide range of stakeholders makes GIVE a standout example of funding innovation, showing how governance structures can foster both inclusiveness and flexibility in VET systems.

The **AILEEN** CoVE presents a robust example of trans-sectoral innovation. It has built a transnational CoVE network with a quality-assured governance structure, involving education and training providers, certification bodies, and research centres across the various sectors involved in Aerospace & Defence. Apprenticeship programmes are co-designed with industry, and research problems are channelled into training content through close collaboration between VET providers, universities and companies, demonstrating a full-circle model of knowledge generation, transfer, and implementation.

TOUR-X harnesses the diverse expertise and networks of its partners to engage a broad spectrum of stakeholders. Its EU Funding Box tool empowers tourism SMEs and VET providers to access financial support for training. By doing so, TOUR-X strategically advances a more inclusive and future-oriented skills ecosystem, expanding participation in its activities among non-traditional learners and adults in lifelong learning at EQF levels 3–5.

Local and regional cooperation models

VOLTAGE showcases the potential of local governance models, such as the *Teknikcollege* approach in Sweden, to better align vocational education and training with industry needs. In its initial phase, the project focused on the local level, leveraging the partners' prior experience and Sweden's well-established collaborative structures. The *Teknikcollege* model exemplifies sustained multi-stakeholder collaboration by effectively integrating practical, hands-on learning with the real demands of industry. Through this model, enhanced governance structures have emerged as essential for co-creating skills ecosystems that support broader development objectives.

Elsewhere, **3LoE** is characterised by a well-structured model of regional CoVEs including public authorities, chambers of commerce, VET providers, and universities, all bound by formal cooperation agreements. The model is notable for embedding VET within national qualifications frameworks and enabling effective cross-border exchange via jointly developed curricula, evaluation cycles, and associated partners from 13 countries.

AI4VET4AI is another exemplary case, demonstrating how a transnational initiative can be rooted in strong regional cooperation. With 26 partners across 11 countries, its governance approach builds on structured work packages assigned by partner expertise (e.g., MCI Austria leading MOOC development; AlterContacts leading stakeholder engagement) while ensuring regional partners play a key role in adapting outputs to their local skills ecosystems.

3.1.4. Synergy in partner roles and responsibilities across activity clusters

A key trend across projects is the strong interdependence between activity clusters. Rather than operating as separate activities, most CoVEs function as integrated ecosystems, where Cluster 1 (Teaching and Learning) is informed by Cluster 2 (Cooperation and Partnerships) and sustained through Cluster 3 (Governance and Funding). Successful implementation of vocational excellence depends on a balanced, collaborative ecosystem in which each partner plays a specific, and often complementary, role across the clusters. Education and training institutions anchor the pedagogical and technical aspects of Cluster 1, industry and cross-sector collaboration drive real-world relevance and innovation in Cluster 2, and effective governance in Cluster 3 ensures quality, sustainability, and scalability.

AGRIFOOD4FUTURE illustrates this interplay well: the teaching and learning component is enriched by co-creation and field-testing activities with companies (Cluster 2), while governance efforts (Cluster 3) focus on embedding innovation and training into regional agri-food systems.

In **Auto CoVE 2.0**, Cluster 1 and Cluster 2 are intertwined in the collaborative development workshops where educators and business representatives jointly develop, pilot, and refine courses. These activities also feed into governance structures by creating feedback loops and quality assurance mechanisms that strengthen the implementation of education and training innovations.

Governance and funding activities in Cluster 3 provide the institutional foundation that enables the innovation in teaching and learning (Cluster 1) and the expansion of cooperation and partnerships (Cluster 2). Strategic multi-level governance and diversified funding ensure that new pedagogical approaches are embedded into mainstream provision and backed by sustainable resources, as seen in the **AI4VET4AI**, **SHOREWINNER**, **EUVECA**, **EE4M** and **3LoE** examples. This creates the stability required for scaling innovative practices across regions and sectors.

At the same time, inclusive and regionally grounded governance models strengthen cooperation by engaging public authorities, companies, and education and training providers, as illustrated by the **GIVE** and **VOLTAGE** examples. This alignment not only builds trust and ownership but also supports transnational and local partnerships that co-create VET curricula that are responsive to labour market needs. Funding needs for the professional development of educators complements these efforts by equipping teachers and trainers with the skills to implement innovative learning models and maintain dynamic exchanges with industry.

The complementarity across the three activity clusters reflects the CoVE concept as more than a partnership – it functions as a skills ecosystem, where governance and funding activities provide stability and strategic alignment, cooperation and partnership activities ensure relevance for all parties involved, and teaching and learning activities deliver impact and concrete outputs.

3.2. Partnership development approaches

The development of CoVE partnerships is complex and context-dependent, but common patterns emerge. **Successful models often rely on pre-existing networks, shared goals, flexible partnership frameworks, and strong links between VET and industry**. However, challenges remain in aligning institutional cultures, ensuring mutual understanding, and managing governance structures, particularly in transnational settings.

Furthermore, the CoVEs under review are at varying stages of development, depending on the Erasmus+ project call year in which they received funding. This naturally leads to differences in the maturity and strength of partnerships across projects.

3.2.1. Partnerships based on pre-existing collaborations

In many cases, partnerships are built upon pre-existing collaborations at regional and international levels, providing a solid foundation on which new initiatives can grow.

For instance, **EULEP** builds on the existing network of national and regional Chambers of Commerce and Industry (CCIs), affiliated with Eurochambres. These CCIs already have strong connections with local authorities and businesses. The project further strengthens its ecosystem by developing synergies with the European Digital Innovation Hubs (EDIHs) network[16], particularly in the domains of Artificial Intelligence, Virtual Reality, and Social Innovation, which are key thematic areas of the CoVE. The collaboration between CCIs and VET providers is driven by skills needs expressed by the business community. At the transnational level, EULEP's regional CoVEs aim to address shared challenges through mutual cooperation, particularly those challenges that would be difficult to tackle individually.

Similarly, **EUVECA** builds its partnership model around Regional Vocational Excellence Hubs (RVEHs), inspired by the ECHAlliance (now Global Health Connector) Regional Health Ecosystem model. This brings together stakeholders from education and training, healthcare, business, civil society, and policy institutions to co-create solutions in the field of health and care.

The **EE4M** CoVE builds on an existing network of energy-focused technical institutions and manufacturing associations. EE4M integrates industry leaders, VET providers, universities, and technology hubs to co-design curricula targeted at energy efficiency in production. Early engagement with SMEs and large manufacturers ensures that skills development is aligned with immediate market needs. The partnership model emphasises pilot projects within manufacturing sites, combined with cross-border knowledge exchange, to foster both local impact and European-wide applicability.

TOUR-X capitalises on pre-existing regional networks and long-standing relationships with regional authorities in the tourism sector as the basis for its skills ecosystem, leveraging trust and experience from previous EU-funded projects to consolidate cohesion, foster skills anticipation, and develop innovative learning materials. This model ensures sustained engagement with the tourism industry, better alignment with labour market needs, and the development of knowledge triangle models linking education and training and research, reinforced by the internationalisation efforts undertaken by the chambers of commerce involved in TOUR-X.

[16] For more information: https://european-digital-innovation-hubs.ec.europa.eu/et/home

3.2.2. Ecosystem structuring and tailored partnership models

A recurring strategy across the CoVE projects is to develop multi-stakeholder networks that integrate education and training institutions with industry partners to ensure that training programmes are aligned with labour market needs.

The **3LoE** CoVE illustrates how the ecosystem structure functions in practice: it mobilises SMEs, chambers of commerce, craft associations, and HEIs into a tailored partnership model that supports dual VET programmes focused on the green transition. These partnerships are formalised through cooperation agreements and, in some instances, national legislation (e.g. CoVE DE Hamburg), ensuring long-term commitment. This ecosystem model facilitates the sharing of theoretical and practical knowledge, best practices within and across borders, helping to bridge divides, such as those between business and academia or between blue- and white-collar professions in regions like Poland and Lithuania.

Customised strategies that reflect local ecosystem characteristics are also important. The **Talentjourney** CoVE, for instance, applies a dual-layered partnership model across its four regional hubs (Slovenia, Finland, Estonia, Italy). These include “sustainable partnerships”, i.e., long-term, strategic collaborations based on shared governance, as well as “changing partnerships”, short-term, project-based partnerships built on flexible engagement. This approach balances stability with adaptability and has proven effective in supporting regional needs. In practice, each hub applied a tailored strategy reflecting its local specificities: Slovenia distinguished between tutors (school-based educators) and mentors (industry-based trainers) and drew on smart specialisation chains, alumni clubs, and crowdfunding foundations; Finland built on trade unions, foundations, and strong municipal support; Italy relied on a multi-level governance model with technical institutes and business organisations; and Estonia mobilised sectoral associations and industrial players, though with weaker VET-university links. Together, these differentiated strategies show how the dual-layered model enabled Talentjourney to strengthen regional ecosystems while maintaining a coherent transnational framework.

AGRIFOOD4FUTURE strengthens local CoVE cooperation by embedding business-education and training partnerships and internationalisation into VET ecosystems. The CoVE’s key activities aim to structure the dairy industry’s skill ecosystem. They include peer learning through lighthouse farms, smart farming demonstrations, and open innovation test farms, linking business startups with established companies. In addition, AGRIFOOD4FUTURE holds an international summer school that combines peer learning with entrepreneurship and innovation support.

VOLTAGE ensures predictability and trust through transparent work package design to ensure predictability and clarity in roles, applying a consistent ecosystem structure across its five regional CoVEs that brings together VET providers, energy companies, municipalities, and innovation agencies, while also capitalising on established models like Sweden's *Teknikcollege* and Finland's Vaasa Energy Cluster, also known as *EnergyVaasa*, a Nordic and global hub for energy technology that gathers companies, research institutions, and municipal partners to drive innovation in clean and smart energy systems.

3.2.3. Challenges in partnership development and approaches to overcoming them

Despite the diversity of CoVE contexts, several observable challenges in partnership development emerge across projects. These difficulties often stem from the complexities of transnational, cross-sectoral, and multi-stakeholder collaboration, which require balancing regional differences, institutional cultures, and governance structures.

While CoVE partnerships demonstrate evident strengths and successes, recurring challenges persist in operationalising multi-stakeholder collaboration, particularly in engaging industry partners, sustaining activities beyond Erasmus+ funding, and navigating different VET policy systems, and reconciling varied perspectives on vocational excellence.

The CoVEs reviewed illustrate a diverse yet converging set of approaches to these challenges, testing the boundaries of integrated skills ecosystems. The strongest examples demonstrate strategic alignment, structured coordination, and a clear division of labour, underpinned by shared goals and mutual benefits that foster a common understanding among partners. Experiences also show that systemic, cultural, and operational barriers can be overcome when partnerships are inclusive, responsive, and adaptable.

Engaging industry partners by demonstrating tangible results

A commonly reported barrier relates to initial engagement of companies, especially in sectors unused to co-developing education and training content.

In **INVESTech**, for instance, companies were hesitant to participate without a clear and tangible product offering. Experience from this CoVE so far reveals that successful business engagement requires substantial effort from the partners through personal connections or targeted incentives, such as offering pilot testing opportunities or customised training modules and a clear articulation of benefits such as access to quality workforce, and collaboration in research projects of relevance to the future of their sectors.

AILEEN has faced challenges in mobilising resources and securing broad sectoral buy-in for its objectives. Nevertheless, by using targeted outreach, the project was able to engage key stakeholders in the aerospace and defence sectors, illustrating that resource constraints can be mitigated through focused engagement strategies.

EULEP identified challenges in engaging industry experts, particularly in emerging fields where demand for such professionals is high. Legal and structural differences across the participating countries added further complexity in terms of fostering a shared sense of ownership within the skills ecosystem. Despite these obstacles, cooperation between Chambers of Commerce and Industry (CCIs) and VET providers, grounded in clearly defined business skills needs, has enabled EULEP to secure tangible engagement from industry partners.

Other examples include **Auto CoVE 2.0**, **EPLUG**, and **HABITABLE** which engage industry partners by addressing their needs, focusing on demonstrating tangible impact, and reconciling the pace and communication styles of education and industry.

More specifically, **HABITABLE** has engaged companies by delivering clear, practical value through digital platforms tailored to business needs. The DUAL Online Centre links SMEs with VET providers, building partnerships, promoting inclusive apprenticeships, and driving green and digital transitions. The SKILLS HUB complements this by centralising training, certification, and career guidance, giving SMEs easy access to tools and programmes to upskill their workforce.

Sustaining CoVE partnerships and activities

Sustaining partnerships and funding structures beyond project lifecycles remains a critical issue. **AI4VET4AI** and **EUVECA** illustrate how this challenge can be addressed by embedding governance models into national and regional strategies and securing continued financing through public-private partnerships or national funding mechanisms. Both examples also show the value of leveraging digital platforms for the co-creation of learning and training materials, which supports the long-term integration of project outcomes into educational and professional structures.

Several projects acknowledge the operational challenges in implementing strategic frameworks for collaboration. For instance, **FEA-VEE** highlighted governance limitations where the lack of official recognition for its training materials is currently restricting their formal integration, relying instead on voluntary uptake by VET and HE providers. However, the long-term sustainability of the initiative is supported by the increasing policy emphasis on the sustainable and circular economy in the fashion, textile, and clothing sectors, where the project's relevance to the EU's broader economic priorities strengthens its prospects for continuation.

Other CoVEs address this challenge through other approaches. **PoVE Water Scale-up** fosters shared responsibility between VET institutions and industry for training sector specialists, ensuring continuity and relevance over time. **H2CoVE** uses a strong knowledge base to identify the right stakeholders and maintain engagement throughout the activities while **Talentjourney** applies a layered model that combines sustainable, long-term partnerships with flexible, short-term collaborations,

Aligning policy realities with expectations

Cross-country and cross-sector collaboration poses logistical and regulatory challenges, including navigating different legislative environments, reconciling divergent teaching and learning cultures, and managing language barriers.

A central challenge lies in aligning divergent regional realities and institutional expectations. For instance, **VOLTAGE** highlighted the challenge of harmonising regional contexts while ensuring the meaningful engagement of teachers and learners; it has addressed this by deploying industry ambassadors to raise awareness of the battery sector and career opportunities, fostering long-term partner engagement, and inspiring participation across diverse regions. Similarly, **HABITABLE** and **EPLUG** have emphasised the need for deeper understanding of diverse European VET systems and better alignment between education and training and business actors, especially regarding the pace of decision-making and communication styles. **EPLUG** tackled this by combining local needs assessments with the EQF as a shared reference, allowing partners to coordinate curricula, share innovations, and adapt them to local contexts – exemplified by Romania, which transformed European expertise into a nationally recognised Urban Gardener qualification aligned with labour market needs. **HABITABLE** approached the same challenge by building a lasting alliance between VET providers and the Habitat industry. By developing a shared framework to bridge differences in language, processes, and working cultures, the project promotes mutual understanding and effective collaboration, supporting a data-informed, technology-enhanced approach to sustainable skills development across Europe.

AEDIL has also addressed the challenge of aligning policy realities with expectations by fostering relationships across the knowledge triangle of education and training, research, and business. Through international exchanges, capacity-building activities, and clustered cooperation – where partners are grouped into sub-groups based on region, shared curricula, or specific platforms – teachers, researchers, and industry collaborate to co-develop courses, share best practices, and harmonise skills development across countries with varying VET maturity and policy frameworks.

Getting all partners on board with a common understanding

The establishment of a shared identity and common understanding of vocational excellence, which partners can rally round, and which attracts wider participation in the CoVE, can also be a challenge.

For instance, in **AGRIFOOD4FUTURE**, efforts to create a unified CoVE label revealed national differences that made it hard to ensure consistency across the wider network. To address this, it has established a network of test farms across Europe, creating a CoVE label that recognises farms piloting innovative practices and providing feedback. This label helps align partners around a shared understanding of vocational excellence and strengthens a collective CoVE identity.

For **Care about IT**, consortium partners initially faced challenges in connecting with existing networks, as some actors initially feared the CoVE would take over their roles instead of collaborating with them. This concern highlighted the need to clearly communicate the project's intention to complement and build on existing structures rather than replace them. To address these concerns, the CoVE has leveraged strong local partnerships and transparent communication, aligned expectations and fostered a shared understanding among stakeholders.

Cultural and linguistic differences remain persistent barriers to effective collaboration. These can impede communication, delay decision-making, and undermine trust among partners. **SHOREWINNER**, for example, acknowledged that national partnerships were easier to establish than international ones, but even national-level collaboration was constrained in contexts such as Cyprus due to limited offshore energy sector maturity. Language barriers and differing institutional norms further complicated efforts to build strong working relationships. To address this challenge, it has ensured regular interactions through bi-monthly consortium meetings, gradually building trust and familiarity among partners, while reinforcing confidence through transparent fund transfers to strengthen cooperation and support the formation of lasting international partnerships.

3.2.4. Cooperation between VET and tertiary education

Across the Erasmus+ CoVE projects, the VET-tertiary education cooperation dimension is particularly noteworthy due to strong institutional commitment among the parties involved as evidenced by their shared goals of enhancing education and training quality, fostering innovation, and addressing skills mismatches in the labour market.

With the growing demand for higher-level skills, CoVEs view cooperation between the VET and Higher Education (HE) sectors as essential for upskilling

and career progression for individuals with standard VET qualifications, either through the creation of new programmes or the redesign of access pathways.

Equally important is leveraging this cooperation to enable the VET sector to contribute to 'knowledge triangles' linking business, education and research/innovation – an area in which VET has traditionally had limited involvement[17]. In these knowledge-creation activities, VET can play a distinctive role by engaging learners in applied research, fostering entrepreneurial skills, and supporting business creation as well as product or service innovation, thereby facilitating the dissemination and uptake of innovations across the business community.

However, a notable finding is that most cooperation involves the co-design of new or improved higher-level VET courses and the opening up of pathways from lower-level VET, rather than new knowledge creation through VET getting involved in research and innovation.

AILEEN highlights HEIs' central role in fostering collaboration through working sessions and skills competitions, specifically linking education and training providers with the Aerospace & Defence (A&D) industry. This approach underscores the importance of interactive and competitive settings in strengthening industry-education ties.

Auto CoVE 2.0's Collaborative Development Workshops foster the cross-fertilisation of knowledge among educators at both the secondary and tertiary levels, as well as industry representatives. This approach creates a feedback loop that enhances pedagogical quality while integrating the latest industry insights.

The **Care about IT** project demonstrates the importance of VET-HE partnerships in applied research, critical for elevating the status of VET in countries like Italy. The **HABITABLE** CoVE highlights how co-locating VET centres with university campuses enhances collaboration and prestige for both VET and HEIs, advancing the systemic integration within vocational ecosystems.

In the **3LoE**, **EULEP** and **CATALYST** CoVEs, HEIs engage in governance activities to reinforce VET's alignment with economic needs, highlighting the importance of leveraging national and EU financial instruments for continuous development.

Across the analysed case studies, cooperation between VET and HEIs is shown to be anchored in formal partnership commitments which help to foster sustainable governance models within CoVEs. Most collaborative activities are

[17] Hazelkorn, E. and Edwards, J., Skills and Smart Specialisation: The role of Vocational Education and Training in Smart Specialisation Strategies, EUR 29875 EN, Publications Office of the European Union, Luxembourg, 2019, ISBN 978-92-76-11889-3, doi:10.2760/828852, JRC118229.

focused on curriculum development and pedagogical innovation, which support the alignment of education and training programmes with labour market demands for higher level skills and more flexible and individualised learning, ensuring that diverse learner needs are catered for. A less common aspect of VET-HE cooperation relates to the research and innovation domains.

3.3. Skills development activities

This section looks at the work of CoVEs to develop skills responding to dynamic labour market demands and societal issues, particularly influenced by the green and digital transitions and the necessity for workforce upskilling and reskilling. In this regard, this section also covers the extent to which CoVEs make use of relevant EU competence frameworks and develop innovative methods for the acquisition of skills aligned with modern labour market needs.

3.3.1. Types of skills developed by the CoVEs

As highlighted in Section 3.1, teaching and learning activities are often informed by labour market skills anticipation, drawing on close collaboration with employers and rigorous labour market intelligence (LMI). While standard anticipation tools typically focus on broad sectoral or occupational trends, CoVEs complement these insights with granular, locally sourced data, collected through employer consultations, surveys, foresight studies, and skills mapping exercises.

The skill development strategies implemented span transversal, occupation-specific, digital, and green skills. Digital skills – particularly those tailored to specific sectors – are most prevalent, reflecting the fact that digital transition and automation are reshaping occupational profiles across all sectors. Green skills are also well represented, though more unevenly. This seems to reflect the specific environmental challenges and opportunities of each sector rather than a broader conception of 'green skills' as being relevant to all occupations and workplaces in the context of the unfolding climate crisis[18].

[18] See, for example, European Commission: Directorate-General for Employment, Social Affairs and Inclusion, *Vocational education and training and the green transition – A compendium of inspiring practices – 2024 edition*, Publications Office of the European Union, 2024, https://data.europa.eu/doi/10.2767/2340109; International Labour Office (2022) Greening TVET and skills development: a practical guidance tool. https://www.ilo.org/publications/greening-tvet-and-skills-development-practical-guidance-tool

Digital skills: cross-cutting and sector-specific

Digital skills are a dominant and cross-cutting theme across nearly all Erasmus+ CoVE projects, with the majority focusing not only on basic digital literacy but also on advanced sector-specific applications. These skills are frequently aligned with the digital transformation of specific industries, making them both transversal and occupation specific. Many CoVE examples demonstrate this.

EULEP delivers modules on AI, VR, and social innovation, including business applications, ethical and legal aspects, and sectoral use cases. These were designed for immediate use by SMEs and VET trainers working on digital transitions. **INVESTech** has taken a modular micro-credential approach to digital skills in high-tech fields such as AI, blockchain, and quantum computing. **Talentjourney** focused on Industry 4.0, offering training in cybersecurity, content creation, problem-solving, and collaboration, tightly linked to the demands of smart manufacturing.

HABITABLE aims to integrate digital competence into modular curricula on sustainable construction, designed for flexibility and rapid updates in response to evolving technology. **EPLUG** offers digital skills in the context of urban greening, where learners used sensor technology, virtual 3D models, and environmental monitoring systems to explore and manage green infrastructure. In **FEA-VEE**, digital skills support the exploration of sustainable fashion practices using 3D printing and design tools.

Across these initiatives, digital skills are not an add-on but a fundamental component of VET programmes delivered by the Erasmus+-funded CoVEs. They enable learners to navigate digitally mediated workplaces, respond to automation trends, and engage in cross-sector collaboration.

Occupation-specific skills

Occupation-specific education and training is the backbone of VET and, in pursuing excellence, CoVEs are expected to 'increase VET systems' responsiveness to adapt skills provision to evolving economic and social needs, ensuring that VET is at the forefront of providing solutions to the challenges posed by rapidly changing skills needs'[19]. In other words, CoVEs have a key role to play at the leading edge of skills development in response to changes in production and service delivery processes. The CoVE projects analysed illustrate this well, with projects focusing on the latest skills needs of their target sectors and/or the needs of sectors/occupations that have not traditionally been a focus for VET.**EUVECA**, for example, focuses on healthcare-specific skills – such as

[19] https://erasmus-plus.ec.europa.eu/programme-guide/part-b/key-action-2/centres-vocational-excellence#footnoteref15_6j41nwh

chronic disease management and personalised care – through the use of AI and VR patient simulation scenarios. **ECoVEM** addresses technical skills in microelectronics, including design, fabrication, and photovoltaics, with EQF-level-aligned courses ranging from technician to researcher level. It also offered modules related to automotive electronics and electric vehicle technologies.

In **AILEEN**, training modules in additive manufacturing have been matched to established qualification profiles such as welding technician or engineering designer. The CoVE has developed 11 competence units across EQF levels 3 to 6, ensuring clear occupational progression pathways. The **TOUR-X** CoVE has provided layered training in hospitality and travel operations, combining practical learning in hotel-based labs with sector-specific digital and green skills.

SHOREWINNER and **PoVE Water Scale-up** focus on training linked to the offshore renewable energy and water management sectors respectively, addressing identified gaps in technical roles, such as maintenance, monitoring, and operational coordination. **PROMOTE**, meanwhile, is tailoring vocational education and training courses to professionals working in the justice and correctional sector, a traditionally underserved occupational field in VET.

Importantly, STEM skills (Science, Technology, Engineering, and Mathematics) are often embedded in CoVE projects as part of occupation-specific training, ensuring that learners acquire both specialised and cross-cutting technical foundations. For instance, **ECoVEM** courses integrate microelectronics training with broader STEM skills relevant to green and digital transitions, while **Auto CoVE 2.0** connects automotive training in Advanced Driver Assistance Systems (ADAS) with essential mathematics and physics pathways. Similarly, **EE4M** embeds analytical thinking, coding, and technological literacy into industrial engineering curricula for the mobility value chain – from vehicle design and production to digital and energy systems that support transport innovation. **HABITABLE** fosters STEM and innovation-oriented learning through material science, digital engineering, and AR/VR-based applications, supported by flexible learning tools such as MOOCs and micro-credentials. Finally, **Talentjourney** combines scientific and engineering disciplines – materials, electronics, mechatronics, and mathematics – to strengthen learners' problem-solving and precision skills.

Transversal and soft skills

Transversal skills, despite their long-standing and growing importance, present many challenges for VET in terms of their integration into programmes and qualifications and hence often do not feature prominently or explicitly in VET provision. CoVEs often seek to remedy this situation: in 2019 it was found that it

was 'common for CoVEs to embed these competences in their programmes'[20], recognising their increasing role in the modern workplace, especially related to the green and digital transitions.

The Erasmus+ CoVE projects reflect this situation, frequently including transversal competences, such as communication, collaboration, adaptability, and critical thinking, into their education and training models. For example, the **3LoE** project embedded entrepreneurship training and critical thinking into its curricula to foster innovative mindsets, especially relevant to SMEs. The **TOUR-X** project has included communication, teamwork, and leadership alongside hospitality and travel agency skills, promoting a holistic skills profile suited to service-oriented industries. Similarly, **INVESTech** is supporting the integration of interpersonal and other soft skills with ICT technical training.

AI4VET4AI, **GIVE**, and **MOSAIC** have used co-design approaches and participatory governance models to shape training that embeds inclusivity, social awareness, and learner empowerment, making transversal skills part of the learning culture. This trend reflects a shared understanding that transversal competences are crucial not only for employability and career adaptability in fast-changing labour markets, but also for learners' personal development.

Sector-responsive green skills

Green skills are increasingly incorporated into CoVE curricula, though their presence is more sector-specific and less systematically embedded compared to digital competences. While green skills may not always be explicitly integrated into curricula, many CoVEs nonetheless equip learners with competences that support the green transition, particularly in sectors such as sustainable energy, construction, and fashion. As noted above, this reflects a narrow conception of green skills related to occupation-specific technical skills rather than broader green competences related to widening understanding of the green transition and how it affects every workplace.

3LoE included green technologies, circular economy principles, and renewable energy in its dual education programmes. In **AEDIL**, training modules address sustainable dairy production, including plant-based alternatives and energy efficiency practices. **AGRIFOOD4FUTURE** focused on regenerative carbon farming, digital agriculture, and climate risk adaptation strategies, reflecting the ecological priorities of the agri-food sector. **SHOREWINNER** embeds green skills into offshore energy training by aligning curricula with sustainability goals,

[20] pp. 28-9. European Commission: Directorate-General for Employment, Social Affairs and Inclusion, *Mapping of Centres of Vocational Excellence (CoVEs)*, Publications Office of the European Union, 2019, **https://data.europa.eu/doi/10.2767/646482**

renewable technologies, and eco-friendly practices, equipping learners with the competencies to support the green transition and drive sector innovation.

Elsewhere, **Talentjourney** developed green modules for smart manufacturing, covering eco-materials, energy efficiency, and sustainability-driven innovation. Similarly, **TOUR-X** has introduced green practices in hospitality training, aligned with sustainability objectives in tourism, and reinforced through hands-on experiences in dedicated hospitality labs.

EPLUG and **HABITABLE** have both designed curricula for specific professions in sustainable urban infrastructure and climate adaptation, integrating digital tools to enhance green awareness and practices. However, several CoVEs indicate that green content, while increasingly relevant, is still in development stages or treated as a complementary component to technical or digital training.

3.3.2. Use of EU Competence Frameworks

CoVE projects draw on EU competence frameworks to inform their analysis of skills needs and the development of programmes and qualifications. These frameworks, particularly **DigComp**, **GreenComp**, and to a lesser extent **EntreComp**, play an important role in shaping training provision. They support curriculum development and transnational cooperation by providing reference points and a common 'language' for interpreting skills needs. At the same time, the degree of integration varies widely. Some projects have embedded these frameworks explicitly into their course structures and learning outcomes, while others use them more loosely as sources of inspiration or reference points during design and planning phases.

Several CoVEs demonstrate a **formal and structured use** of the frameworks, aligning their education and training programmes and modular content directly with the competences defined in the EU tools. For instance, the **3LoE** and **PROMOTE** projects exemplify a clear commitment to embedding DigComp and GreenComp into their curricula. In 3LoE, multiple frameworks are integrated to support the development of green and digital competences, ensuring that learners are equipped for ongoing societal transitions. Similarly, PROMOTE standardises its courses across partner institutions by aligning them with both DigComp and GreenComp, thus reinforcing the relevance and consistency of digital and environmental learning outcomes.

Other projects show comparable levels of formal integration. In **AI4VET4AI**, DigComp and GreenComp are applied to over ten thematic curricula that span sectors like healthcare and tourism, with a view to modularise these and support stackable micro-credentials. **AGRIFOOD4FUTURE**, **AEDIL**, and **Auto CoVE 2.0** similarly integrate the two frameworks to structure curricula tailored to their specific sectors – agrifood, dairy, and automotive respectively – embedding green and digital skills in a systematic manner. The **Care about IT** project uses

DigComp explicitly to assess digital competence development among healthcare professionals and applies GreenComp principles to frame best practices in sustainability.

The **CATALYST** project incorporates GreenComp into its green skills courses and EntreComp into entrepreneurship courses. These frameworks are used not only to guide course development but also to assess the skills needs of SMEs, thus creating a feedback loop between labour market demand and curriculum design. In **HABITABLE**, both digital and green innovations are central, with DigComp and GreenComp providing a reference for skills development in areas such as circular economy and digital technologies including AI and blockchain. Likewise, **SHOREWINNER** aligns its digital and green content with DigComp and GreenComp, integrating Virtual Reality (VR) as a key tool for training delivery, particularly in geographically isolated contexts. **EULEP** focuses on transversal skills development using EntreComp, which is selectively applied to define learning outcomes for the social innovation (SI) training pathway. Although **EULEP** acknowledges DigComp and GreenComp, they are not actively used; instead, the project prioritises practical applications of digital tools without a strong focus on competence-based instruction.

Finally, projects like **VOLTAGE** illustrate how EU frameworks can be used not only to inform course design but also to support sectoral standardisation and validation. Here, DigComp and GreenComp are valued as consistent, validated references that aid the development of a comprehensive competence framework for the battery sector. The use of these tools facilitates recognition of skills across borders and aligns training with industry needs. The project further reinforces this consistency through the Automotive Skills Alliance, which supports the validation and mapping of competences relevant to the sector.

While many projects adopt a formalised approach, others refer to EU frameworks in a more **informal or inspirational** manner. In **AILEEN**, for example, DigComp and GreenComp are used as conceptual tools to inspire the development of green and digital modules. The project team mapped the domains and levels of complexity in the frameworks to the needs of workers in specific sectors, indicating a thoughtful but less prescriptive application. **EUVECA** similarly engages with the frameworks at the level of discussion and planning rather than embedding them into curricula. **Talentjourney** incorporates elements of transversal, digital, and green skills in its training modules, which reflect the principles of DigComp and GreenComp but were developed before GreenComp's formal publication, indicating implicit alignment rather than direct integration.

Some projects explicitly describe their use of EU frameworks as **non-formal or limited**. In **EPLUG**, the application of DigComp and GreenComp is characterised as implicit and not structurally embedded in the curriculum. **MOSAIC** follows a similar model, applying EntreComp and DigComp only to individual courses – on entrepreneurship and teacher training respectively – rather than across the board.

In summary, the analysis reveals a spectrum of engagement with EU competence frameworks across CoVE projects. On one end, some CoVEs have formally embedded frameworks like DigComp, GreenComp, and EntreComp into the core of their curricular design and assessment strategies. On the other, some projects use these frameworks informally or selectively, serving more as sources of inspiration than prescriptive guides. This variation reflects differing project scopes, levels of maturity, and sector-specific needs, but overall highlights the widespread use of EU frameworks as important guides to support the work of transnational CoVE projects.

3.3.3. Innovative approaches to teaching and learning

Innovation in teaching and learning methodologies and materials is a cornerstone of excellence in CoVEs, as reflected in the Erasmus+ guidance which highlights the adoption of more learner-centred pedagogies, especially project-based learning that spans subject boundaries and involves learners in tackling labour market problems/challenges, as well as the use of digital technologies.

Innovative pedagogical practices feature in many of the CoVE projects reviewed, supporting rapid adaptation to new skill demands linked to sectoral transformations and emerging sectors. They are also made possible thanks to the development of modular types of learning format (see Section 3.3).

Both **GIVE** and **PROMOTE** place **inclusive, learner-centred pedagogies** at the core of their innovation. **PROMOTE** introduces the first VET programme focused on the correctional sector, combining micro-credentials in transversal, green, digital, and sector-specific skills with blended learning and simulations, enabling flexible cross-border recognition and career progression while also introducing ‘correctional pedagogy’ (i.e. pedagogical approaches tailored to correctional environments) to European VET. **GIVE** focuses on equipping trainers, tutors and job coaches with the skills to design personalised learning plans and provide tailored support for disadvantaged learners, including people with disabilities.

Another innovative pedagogical approach is **capacity-building for teachers combined with collaborative, practice-oriented learning**. For instance, **3LoE** and **AGRIFOOD4FUTURE** both strengthen teaching quality by equipping educators with digital, green, and entrepreneurial competences, while using participatory formats such as peer learning, co-creation workshops, and online forums to foster continuous exchange. In **AGRIFOOD4FUTURE**, this collaborative dimension extends further, as farmers, students, and other stakeholders co-create solutions to real challenges such as climate change, farming practices, and policy, with their insights feeding directly into new e-learning tools. In this way, these projects illustrate how competence-based pedagogy can both empower educators and, in some cases, actively engage learners and stakeholders in shaping innovative education and training resources.

Another layer of innovation across CoVEs is the **integration of emerging technologies** into teaching and learning processes to **create immersive learning environments** that potentially modernise and enhance the content and delivery of VET. For example, **AEDIL** leverages digital twins (i.e., digital models mirroring real objects) and 3D scans in the dairy sector to that effect. **AILEEN** and **EUVECA** explore the potential of Virtual Reality (VR) and Augmented Reality (AR) potential to create immersive learning in aerospace and healthcare respectively. **PoVE Water Scale-up** uses VR simulations of wastewater treatment plants, enabling students to practice operational responses and enhance technical competence. **Auto-CoVE 2.0** uses VR safety training for lithium battery assembly, allowing students to gain hands-on skills without real-world hazards.

In the same way, **Care about IT**, **MOSAIC**, **EPLUG**, and **Talentjourney** leverage **hackathon-style pedagogies** to foster immersive, project-based learning. These approaches emphasise collaborative problem-solving, rapid prototyping, and peer-to-peer mentorship, enabling learners to apply sector-specific digital skills to real labour market (or industry) scenarios. By simulating intensive, time-bound challenges, they enhance creativity, teamwork, and adaptability while embedding reflection and iterative feedback to consolidate practical knowledge.

Altogether, these case studies show that Erasmus+ CoVE projects are **advancing high-quality teaching and learning** through **pedagogical innovation that emphasises learner inclusion, industry-based applied learning, and digital integration**. While the specific implementation strategies differ across CoVEs, a unifying thread is the commitment to future-oriented, flexible, and collaborative approaches that prepare learners for rapidly changing economic and technological landscapes.

While CoVEs primarily focus on innovation in teaching and learning methodologies, some CoVEs – in particular, **Talentjourney**, **EULEP** and **AEDIL** – stand out for going beyond education and training innovation by introducing emerging technologies **aimed at improving business processes, enhancing industrial productivity and promoting the greening of sectors.**

AEDIL has developed a suite of sustainability-oriented training courses to address the dairy sector's reputation as a significant carbon dioxide emitter. These include modules on plant-based dairy production, designed to diversify product lines and reduce reliance on high-emission livestock-based processes, and on green technologies aimed at improving energy efficiency, waste reduction, and sustainable resource use in dairy operations. The plant-based courses address the technical, safety, and process considerations involved in manufacturing dairy alternatives, equipping learners with the skills to meet growing market demand for sustainable products. The green technology modules cover innovations such as improved process automation for energy savings, sustainable water use practices, and environmentally friendly production system design. Together, these courses aim to position dairy professionals at the

forefront of food sustainability by combining environmental impact reduction with market competitiveness.

Talentjourney addresses training needs in smart manufacturing by integrating AI and AR/VR technologies into its Demo Labs, including installations within companies. These labs serve as hubs for Challenge-Based Learning, where students engage in hands-on prototyping to solve real industry and societal challenges. In these transnational settings, learners work in interdisciplinary teams using advanced tools like 3D printers and robotics. Industry partners co-design challenges aimed at improving their business processes and provide feedback, fostering innovation, critical thinking, and teamwork. The labs are fully integrated into VET curricula and also support teacher training, enabling flexible, experiential learning that aligns with evolving labour market demands.

EULEP actively collaborates with European Digital Innovation Hubs (EDIHs) and local businesses to design training for IoT applications in advanced manufacturing, with the aim of upskilling C-VET learners on the job. These efforts help align VET provision with regional smart specialisation strategies. In this context, consortium partners work closely with EDIHs to develop Smart VET Strategies focused on Artificial Intelligence (AI), Virtual Reality (VR), and Social Innovation (SI). In this setup, course modules are designed to guide businesses in integrating these technologies into their operations, e.g., using VR glasses for immersive product or process simulations, and applying AI for strategic digital planning, Human Resources, and marketing functions. The project places strong emphasis on the practical application of technology in the workplace, helping companies optimise team skills, manage organisational change, and monitor performance. By focusing on technology integration strategies and ethical/legal considerations, EULEP enhances enterprise-level digital transformation capacity, not just individual learners' competences.

3.4. Development of curricula and qualifications

Excellence in VET means adopting new approaches that impact the structure and content of curricula and qualifications. This section explores the extent to which CoVEs contribute to the development of curricula and qualifications that are responsive to evolving labour market needs. It examines the integration of new training content into VET curricula, with a focus on micro-credentials, and the steps taken to achieve formal recognition of CoVE-developed qualifications within national qualifications frameworks (NQFs).

3.4.1. Curriculum development: modular learning and micro-credential pathways

Curriculum development and micro-credentials are increasingly converging within CoVE projects, as both focus on creating flexible, modular learning opportunities that can be integrated into diverse education and training systems. By linking modular curricula with micro-credentials, projects offer learners recognised, targeted pathways that combine formal study, professional upskilling, and lifelong learning.

Across CoVE projects, curriculum development and micro-credentials are closely intertwined, reflecting a shared emphasis on flexibility, modularity, and labour market relevance. Rather than creating entirely new qualifications, most CoVE projects develop modular content that can be embedded in existing formal and non-formal learning pathways, with micro-credentials serving as a key tool to validate skills and support lifelong learning.

For example, **ECoVEM**, as a pilot CoVE, developed 42 modular courses – twice as many as initially planned – representing 1,250 hours of VET content in microelectronics, complemented by shorter courses for 900 trainees integrated into existing programmes. University students could receive ECTS credits, while non-university learners obtained certificates validating their skills. As part of this, **INES Plateforme Formation & Evaluation** created photovoltaic cell fabrication courses at EQF levels 5–8 successfully delivered to industry technicians and demonstrating tangible upskilling outcomes, with very high learner satisfaction rates.

In the **EPLUG** CoVE, consortium partners have used the EQF to compare learning outcomes across six partner countries (Czech Republic, Denmark, Finland, Netherlands, Romania and Spain). They agreed on the core outcomes required for a “future-proof urban greener” profile and visualised them on an interactive metro line map, with each station representing a learning outcome. Each country then linked these outcomes to its respective courses, enhancing transparency for employers regarding lifelong learning opportunities and facilitating transnational knowledge-sharing and course development. EPLUG has developed 45 new or updated qualifications and courses and attracted 239 new partner organisations. While this has harmonised learning outcomes within the CoVE, individual countries remain responsible for implementation, which may result in variations in national application.

CoVEs often align curricula and micro-credentials with European frameworks such as EQF, EQAVET, and ESCO to enhance transparency, comparability, and mobility. **Talentjourney** exemplifies this through transnational modules in AI, cybersecurity, and VR, developed with embedded work-based learning and validated as micro-credentials to support learner mobility. Likewise, **HABITABLE** is piloting a digital training ecosystem to enable cross-border recognition of

specific competences, supported by platforms such as SKILLS HUB and DUAL Online Centre. **EULEP** has structured learning paths in AI, VR, and social innovation at EQF levels 4 and 5, embedding micro-credentials worth 1–3 ECTS to promote lifelong learning.

Curriculum development frequently combines sector-specific and transversal skills with flexible validation formats. **EUVECA** has integrated health and social care training into formal curricula while also offering micro-credentials for the continuing professional development of working professionals, thereby supporting career mobility. **FEA-VEE** has developed modules in 3D printing, VR, and AR for the fashion sector in close collaboration with industry to address skills gaps, showing how micro-credentials can align technological innovation with fashion creation and green entrepreneurship to support both workforce readiness and sustainable sectoral development. **CATALYST** has developed over 70 courses across eight fields for EQF levels 4–8, giving more than 1,500 learners the tools to apply green and digital skills in real contexts –from biodiversity to the circular economy – while embedding industry collaboration and research-informed design to make the skills gained visible and strengthen VET providers' capacity to deliver future-focused, sustainability-oriented training.

TOUR-X has produced a comprehensive modular curriculum for tourism professions across EQF levels 3–7, complemented by a Train the Trainers programme, while **PoVE Water Scale-up**, **MOSAIC**, and **SHOREWINNER** have adapted similar modular approaches to national contexts, demonstrating how such curricula can be flexibly validated through micro-credentials to enhance both local relevance and cross-border portability.

Recognition and validation of micro-credentials remain uneven across countries, often constrained by national regulatory systems and uncertainties around accreditation. Projects such as **CATALYST** and **INVESTech** highlight uncertainties over accreditation responsibilities and the application of credit systems. **AI4VET4AI**, and **EUVECA** have explored sector-specific micro-credentials and lifelong learning applications but have acknowledged procedural delays and uncertainty about their institutional status within national frameworks.

Sustained industry engagement is critical to both curriculum design and micro-credential development. **H2CoVE** presents a particularly innovative case having institutionalised this through formal industry councils in Norway that provide systematic feedback, shifting from ad hoc involvement to structured collaboration and ensuring that curriculum and micro-credential development evolve with hydrogen sector demands. These structured collaborations highlight the growing role of industry not only in ensuring relevance but also in supporting recognition and uptake.

In policy terms, CoVE projects demonstrate how modular curriculum development and micro-credentials can operationalise the **Council Recommendation on a European Approach to Micro-Credentials**. They show

how short, targeted learning opportunities can be embedded into broader qualifications, aligned with European frameworks, and developed in close cooperation with industry to maintain labour market relevance. At the same time, they underline persistent challenges in recognition across national systems and the need for stronger coordination mechanisms to ensure portability and trust. Addressing these gaps will be key to realising the EU's vision of micro-credentials as building blocks for lifelong learning, employability, and mobility across borders.

3.4.2. Formal recognition and integration of developed qualifications in National qualifications frameworks (NQFs)

Across the CoVE project case studies, there is considerable variation in the extent to which newly developed qualifications and courses have been formally recognised and integrated into National Qualifications Frameworks (NQFs). While some CoVE projects have achieved notable progress toward formal inclusion, others remain in early-stage discussions with national authorities or encounter structural challenges that delay or complicate recognition processes.

Some CoVEs demonstrate clear progress in NQF integration. For instance, **3LoE** achieved a major milestone in Austria, where nine new qualification profiles were created. One of them, the Technical Consultant for Energy Efficiency, became the first formal qualification recognised under the new Higher Vocational Education Act (2024). The remaining profiles are still being adapted for formalisation and NQF inclusion, with progress varying across the different partner countries. As previously mentioned, **EPLUG** has developed or updated qualifications in the urban greening sector, with clear pathways toward NQF alignment through EQF referencing and curricula tailored to national labour market needs. **TOUR-X** is also working actively with national bodies like EOPPEP in Greece and regional authorities in Italy, Spain, and Germany to integrate qualifications and micro-credentials into NQFs, with an ambitious target of issuing 1,000 micro-credentials.

Other projects have advanced through partnerships with national authorities or quality assurance bodies. **ECoVEM** integrates its courses into formal programmes (including those offered by VET providers) with appropriate academic credits awarded by HEIs. In Italy, collaboration with INAPP has elevated ECoVEM's practices as a national benchmark for quality assurance and recognition. In Spain, however, partners have faced prolonged administrative processes, seeking EU-wide accreditation to overcome national complexity. Meanwhile, **Auto CoVE 2.0** has already opened discussions with policymakers in Finland and Estonia to inform them of curriculum recommendations in the vehicle field.

For some CoVEs, the challenge lies in developing and disseminating innovative content rather than securing formal recognition. **Auto CoVE 2.0** and **MOSAIC** highlight the complexity of analysing diverse national curricula, adapting to evolving labour market needs, and creating pioneering content from multiple sources working in teams across different countries. Effective dissemination is also critical: both CoVEs stress the need to translate content into local languages and publish it widely used national open educational resources (OER)platforms to ensure scalability and relevance.

Some CoVEs explicitly address the pathways and barriers to official recognition of qualifications within NQFs. **AGRIFOOD4FUTURE** and **FEA-VEE** highlight early-stage policy discussions and efforts to influence national recognition, though tangible results are still pending. **FEA-VEE**, in particular, highlights the difficulties of securing and sustaining policymaker engagement due to competing national priorities. Other CoVEs have taken a different approach, prioritising alternative certification routes rather than immediate inclusion in NQF. **GIVE**, for instance, intentionally embedded its content into existing qualifications and continuing professional development (CPD) offers, thereby avoiding the complexity of formal qualification registration. **SHOREWINNER** and **CATALYST** have similarly prioritised curriculum development or alternative certification routes over formal recognition. CoVEs such as **AGRIFOOD4FUTURE** and **ECoVEM** have explored the European Digital Credentials (EDC) system as a route to transnational recognition, supporting learner mobility and helping bypass national complexity.

As highlighted in the online workshop by the representative of the **Community of Practice of CoVEs (CoPCoVEs)**, many CoVEs face practical obstacles when attempting to certify courses that are not yet aligned with national rules, which would reinforce the case for a European certification mechanism that validates the learning outcomes and quality standards of courses developed in the context of CoVEs. The **annual Forum on Vocational Excellence** nevertheless continues to serve as a vibrant platform for addressing these issues, promoting peer learning, and building stronger collaboration arrangements. Such forums are helping to drive momentum for systemic reform and mutual recognition.

The CoVE case studies reveal both achievements and persistent challenges in developing qualifications that are formally recognised within NQFs. The most successful initiatives share common traits: strong partnerships with national authorities, alignment with EQF principles, engagement with quality assurance mechanisms, and a deliberate strategy for integrating both full qualifications and micro-credentials into formal systems. However, national recognition processes and requirements across the Europe remain diverse and fragmented. Administrative hurdles, the need for national qualification systems to be adapted so they can include micro-credentials in ways that ensure their quality and reliability, and inconsistent stakeholder engagement all contribute to varied outcomes across countries and sectors. While many CoVE projects have laid

solid foundations, sustained policy dialogue and systemic reform will be essential to unlock the full potential of CoVE-developed curricula and qualifications within national and European qualifications systems.

3.5. CoVEs' contribution to Vocational Excellence: Enhancing the quality and attractiveness of VET

Drawing primarily on the evidence analysed so far, this section examines how CoVEs understand and advance the concept of vocational excellence through teaching and learning, cooperation and partnerships, and governance and funding activities, all aimed at enhancing the quality and attractiveness of VET.

3.5.1. Evidence from partnership processes

As shown in Sections 3.1 and 3.2, vocational excellence is tied not only to how CoVEs structure their activities but also to how they manage partnerships. Co-creation in teaching and learning emerges as a defining practice: VET providers, HEIs, companies, public authorities, and civil society actors collaborate in designing curricula, piloting new teaching and learning methods, and embedding applied research into training. These multi-actor ecosystems ensure that education and training remain relevant to industry needs while also strengthening social inclusion and innovation capacity. VET providers play a central role in this ecosystem delivering training and adapting programmes to meet the evolving needs of learners and the labour market. Tertiary education partners bring advanced expertise and research, while employers contribute practical know-how and hands-on contexts. Public authorities provide strategic alignment and legitimacy, embedding outputs in qualifications systems and policy frameworks. By fostering this kind of structured co-creation, CoVEs demonstrate how vocational excellence can be anchored in collaborative, knowledge-based ecosystems rather than in isolated institutions.

Vocational excellence also depends on embedding project innovations into durable systems. As discussed in Section 3.1, many CoVEs align their activities to national and regional skills needs, with a view to integrating curricula into qualifications frameworks, and formalise cooperation through governance structures that extend beyond project funding. Excellence here lies not only in designing innovative education and training but in institutionalising it through governance, policy, and funding mechanisms. For example, multi-level governance structures involving advisory boards, chambers of commerce, and regional authorities ensure that excellence is anchored in local ecosystems while remaining aligned with EU priorities. Sustained professional development for educators further reinforces systemic impact, equipping teachers and trainers to implement new pedagogies and maintain dynamic dialogue with industry. These

governance mechanisms transform excellence from a project outcome into a structural feature of VET systems.

3.5.2. Evidence from skills development activities

The examples presented in Section 3.3 highlight that excellence in skills provision is not limited to occupation-specific training but extends to transversal, digital, and green competences that prepare learners for fast-changing labour markets. Many CoVEs integrate cutting-edge technologies (e.g., AI, AR/VR) directly into curricula, ensuring that learners gain experience with the very tools transforming industry. These innovations are complemented by flexible learning formats, including modular pathways, micro-credentials, and stackable qualifications, which support both initial training and lifelong upskilling. Pedagogical approaches such as project-based learning, challenge-based labs, and hackathons reinforce adaptability, creativity, and problem-solving. Together, these innovations align with EU competence frameworks (DigComp, GreenComp, EntreComp), making CoVE outputs transferable across borders and equipping learners with future-proof skills.

3.5.3. Evidence from curriculum development activities

A defining contribution of CoVEs to vocational excellence lies in linking modular curriculum design with micro-credential pathways. Instead of focusing exclusively on creating new qualifications, CoVEs mostly embed flexible modules into existing programmes, which can be validated as through credit systems or stackable credentials. This allows learners to pursue targeted specialisations while continuing core studies, bridging initial education and training, professional upskilling, and lifelong learning.

As explained in Section 3.4, CoVE projects align their modules and micro-credentials with European frameworks (EQF, ESCO) to strengthen portability and cross-border recognition. Additionally, several CoVEs (e.g., **EcOVEM**, **EULEP**, **EUVECA**) illustrate how modular content in sectors ranging from microelectronics to AI and healthcare can be flexibly validated, supporting diverse learner groups including students, workers, and SMEs. Sector-focused initiatives (e.g., **FEA-VEE** in fashion and **TOUR-X** in tourism) show how micro-credentials can balance technological innovation with cultural and green values, contributing to sustainable development as well as workforce readiness. Sustained industry engagement (e.g., **H2CoVE** and **EPLUG**) further ensures that curricula and credentials remain responsive to evolving labour market needs.

In policy terms, these approaches demonstrate how CoVEs are operationalising the Council Recommendation on a European Approach to Micro-Credentials, embedding short, targeted learning opportunities into broader qualifications systems. This strengthens both the quality and attractiveness of VET by offering

flexible pathways, supporting mobility, and making VET more inclusive and future-proof.

3.5.4. Challenges in defining and applying the notion of Vocational Excellence

Across the CoVE projects, vocational excellence is broadly understood as a holistic concept that goes beyond educational achievement. It emphasises inclusive, learner-centred pathways, innovation in teaching and learning, responsiveness to labour market needs, and strong cooperation with businesses and regional actors. For CoVE stakeholders, a key dimension of vocational excellence is the promotion of inclusive learning pathways and the embedding of learner-centred approaches structurally within VET provision and quality assurance frameworks, rather than treating excellence as an add-on. Communities of practice such as **CoPCoVEs** along with tools like the **ISATCOVE** self-assessment framework developed by the European Training Foundation (ETF), support the institutionalisation of this concept and the development of a shared framework capable of modernising VET across Europe.

Despite these advances, translating vocational excellence into practice remains challenging. Aligning curricula with rapidly evolving labour market demands – particularly in sectors undergoing digital and green transitions – continues to be difficult. Regulatory and institutional barriers, including the varied recognition of micro-credentials and differences across national qualifications frameworks, further compounds this. Problems reported include uncertainty around accreditation responsibilities, uneven portability of micro-credentials across borders, and limited national recognition mechanisms. Even where strong demand exists for stackable or industry-certified credentials, slow-moving policy frameworks often constrain uptake.

Sustaining partnerships beyond project lifecycles, especially in transnational contexts with differing governance structures and funding realities, adds another layer of complexity. Even when there is strong cooperation, cultural and institutional differences can impede a shared understanding of vocational excellence. Moreover, the concept itself continues to evolve and is interpreted differently across projects: some emphasise innovation or sectoral leadership, while others stress inclusion, systemic reform, or internationalisation. While this diversity reflects adaptability to local contexts, it can also risk fragmentation in the conceptualisation of vocational excellence. A more consistent, shared operational definition, supported for example by tools such as ISATCOVE, could help balance local flexibility with overall coherence.

3.6. Contributions of CoVEs to VET policy strategies

This section highlights how CoVEs contribute to national and regional VET policies, shaping reforms and embedding excellence in teaching, curricula, and governance, while also examining their role in promoting upward convergence and reducing disparities in quality and access across regions through cross-border cooperation, knowledge transfer, and inclusive practices. Finally, the section covers how CoVEs align with broader EU policy strategies, including digital and green transitions, skills development, and sectoral initiatives.

3.6.1. Contribution to national and regional strategies

Several examples illustrate how some CoVEs not only contribute to shaping and implementing national and regional VET reforms. They are often embedded within broader strategies for VET excellence at these levels. While acting across borders, CoVEs provide concrete added value at national and regional level.

3LoE CoVEs are embedded in regional **Smart Specialisation Strategies (S3)** and directly contribute to the design and implementation of **regional VET excellence strategies**. By aligning with the EU's **Research and Innovation Strategies for Smart Specialisation (RIS3)**, they support regions in investing in competitive strengths while enhancing the quality and responsiveness of VET provision to meet future skills needs bringing a strong added value in terms of transnational connection of different regions.

AI4VET4AI contributes to strengthening regional VET excellence across **18 NUTS2**[21] **regions**, fostering cross-sectoral curriculum development in priority areas such as healthcare, logistics, and tourism. The project ensures that digital and AI-related skills are integrated into regional training strategies, thus aligning VET delivery with regional innovation agendas.

EULEP exemplifies efforts to reform **regional VET governance** through the development of **Smart VET Strategies**. It has established VET Councils that act as platforms for stakeholder engagement, enabling the co-creation of regional strategies focused on quality assurance, sustainability, and digitalisation in vocational education and training. These structures enhance the coherence and strategic direction of regional VET systems.

Care about IT works in close collaboration with regional authorities in Italy, particularly in the **Piedmont region**, to support regional strategies aimed at modernising healthcare-related VET. Through the co-design of micro-credentials

[21] Overview - NUTS - Nomenclature of territorial units for statistics - Eurostat

and updated curricula, the project contributes to the regional VET excellence agenda by addressing skills gaps in a high-demand sector.

EUVECA contributes to Denmark's national and regional strategies for **VET excellence in the healthcare sector** by embedding green and digital competencies in curricula. The project equips learners with future-oriented skills, directly supporting the transformation of healthcare VET pathways in line with national sustainability goals and sectoral upskilling priorities.

TOUR-X integrates VET excellence into national and regional skills strategies across **Spain, Italy, Greece, Germany, and Switzerland**. By tailoring policy recommendations to each context, it supports the development of coherent and locally adapted VET excellence frameworks. This approach promotes alignment between European-level objectives and national/regional implementation mechanisms, helping ensure the relevance and uptake of reforms.

CoVEs play a crucial role in advancing **upward convergence in VET** across Europe, fostering mutual learning between mature and emerging VET systems. By fostering cross-border cooperation and embedding strategic partnerships, they have the potential to contribute to reducing disparities in VET quality and access across countries while enhancing innovation and excellence.

Several projects demonstrate how CoVE partnerships act as key enablers of upward convergence. **AEDIL** has built a pan-European community of practitioners in the dairy sector, connecting countries with well-established dairy VET programmes, such as France and Germany, with others like Romania and Serbia that have developed their programmes adopting work-based learning inspired by these countries. In Turkey, thanks to **EULEP**, SMEs staff have gained access to internationally developed learning pathways aligned with both EU frameworks and industry needs. A portfolio of best practices designed to be transferable across national contexts was developed by **GIVE** partners facilitating a more joined and inclusive approach to VET, particularly for disadvantaged learners. **Talentjourney** demonstrates how transnational collaboration with industry experts can produce curricula and materials that are transferable across sectors and support capacity-building in less advanced regions.

As highlighted in Section 3.1, some CoVEs demonstrate how well-structured governance and coordinated funding streams can enable the transfer of effective models to less developed national VET systems, helping to close gaps in quality and provision. For instance, **TOUR-X** has developed policy recommendations that account for structural differences across national VET systems, helping to guide reforms and adapt them to specific national or regional contexts. **VOLTAGE** demonstrates how strong industry – VET cooperation in Sweden is being replicated in Turkey, raising quality and access in emerging sectors. **ECoVEM**, and its governance action plan have contributed to systemic VET reforms in several partner countries: German partners supported the introduction of dual VET in Bulgaria, while partners in Cyprus established a new VET cluster

in microelectronics, underpinned by four policy briefs endorsed by regional authorities, thereby reinforcing ECoVEM's influence on VET policies. These examples demonstrate that CoVEs are not only implementing VET excellence strategies but actively shaping them in close collaboration with local stakeholders, embedding reforms within national and regional policy agendas.

By linking VET to broader initiatives such as Smart Specialisation Strategies (S3) as well as sectoral strategies at the local and national levels, CoVEs help ensure that VET provision is responsive to future skills needs and economic transformations. At the same time, through cross-border cooperation, peer learning and the exchange of effective models, CoVEs foster inclusiveness and support upward VET convergence across Europe, reducing disparities in quality and access while enabling regions with less advanced VET systems to strengthen them. In doing so, CoVEs act as catalysts for systemic reform, positioning VET as a driver of regional competitiveness, social cohesion, and sustainable growth in Europe.

3.6.2. Synergies with EU policy strategies

The case study analysis explores how CoVEs strategically align with major EU policy frameworks and instruments to enhance VET systems. CoVEs European dimension is crucial.

The most frequently cited synergies are with initiatives such as the European Skills Agenda, the Digital Education Action Plan, the Pact for Skills, the Green Deal, and the Union of Skills, even though the latter was only recently launched. Their activities reflect a multi-layered engagement with European policy priorities aimed at fostering green and digital transitions, building inclusive and resilient education and training ecosystems, and addressing sector-specific skills needs.

Several CoVEs demonstrate strong synergy with the **European Green Deal** and the **Digital Europe Programme**, translating these policy frameworks into practice within VET. CoVEs such as **CATALYST**, **Talentjourney**, **EUVECA**, **EULEP** and **AI4VET4AI** embed digital and green competences into VET curricula, ensuring that learners and workers are equipped to navigate and shape Europe's twin green and digital transitions. Rather than offering isolated training; they integrate sustainability and digital transformation as guiding principles across their ecosystems.

CATALYST illustrates this approach by fostering innovation in green and digital technologies through applied learning environments and transnational cooperation, directly contributing to sustainable industrial development. Similarly, **AI4VET4AI** supports the EU Digital Strategy by embedding AI and data literacy into VET pathways, preparing future workers in sectors such as logistics, healthcare, and tourism to use emerging technologies responsibly and effectively.

EUVECA highlights the potential of sector-specific strategies to synergise with the Green Deal and the EU Digital Strategy. It promotes sustainability in healthcare by embedding green competences into training programmes, raising awareness of the environmental impact of health services, and equipping healthcare professionals with the skills to reduce resource use. At the same time, its use of **micro-credentials and digital badges** advances the EU Digital Strategy by enabling flexible, modular upskilling that is responsive to technological change and labour market demand.

EULEP creates synergy with the Digital Europe Programme by leveraging the capabilities of European Digital Innovation Hubs (EDIHs) in each region to co-develop targeted continuing VET (C-VET) programmes in Artificial Intelligence (AI), Virtual Reality (VR), and Social Innovation (SI) that are tailored to the sectoral priorities of each region or country, supporting the growth of digital and green economies.

Talentjourney takes a similarly integrated approach. It combines cutting-edge digital technologies – such as IoT, AI, robotics, and cybersecurity – with environmentally sustainable practices in VET delivery. The project establishes Demo Labs and user journeys that not only provide learners with hands-on experience using digital tools but also foster environmental awareness through the implementation of green technologies and energy-efficient processes.

Many projects contribute directly to the **Union of Skills** initiative, which promotes structured and inclusive skill development, through upskilling and reskilling, transnational cooperation, fostering circulation and activation of skills, as well as innovation in credentialing. **Talentjourney**, **VOLTAGE**, **EULEP** and **Auto CoVE 2.0** exemplify this contribution by facilitating portable qualifications, personalised user journeys, and sector-relevant micro-credentials that respond to evolving labour market needs.

Talentjourney advances the Union of Skills by designing cross-border curricula, enabling the mutual recognition of qualifications, and creating training pathways that anticipate industry demand for green and digital expertise. Through close collaboration between VET providers and SMEs, it supports learning mobility, integrates modern technologies, and enhances the attractiveness of VET, while its emphasis on international collaboration and skills portability reinforces European-level efforts to build a unified, future-ready European skills space.

VOLTAGE is developing robust validation systems tailored to the needs of the battery industry, addressing both upskilling and talent retention. It supports the Union of Skills' aim to attract learners into strategic sectors while enhancing professional development for teachers and trainers. Partners in VOLTAGE recognise alignment between the Union of Skills and the CoVE model as they both integrate the priorities of green and digital skills development and deep collaboration with industry in this regard.

Auto CoVE 2.0 has embedded modular, EQF-aligned micro-credentials into automotive VET, supporting flexible lifelong learning and bridging formal with non-formal education. By ensuring qualifications keep pace with technological and environmental change, it promotes cross-border recognition, inclusive upskilling, and policy coordination, thereby advancing a resilient and future-proof VET European skills space in line with the Union of Skills.

EULEP contributes to the Union of Skills by promoting C-VET focusing on AI and VR, helping individuals upskill or reskill to meet business needs. It enhances skills portability and employability across regions, supporting lifelong learning and the free movement of skilled workers in the EU.

Engagement with the **Pact for Skills** is widespread. CoVEs such as **3LoE**, **Auto CoVE 2.0**, **FEA-VEE, MOSAIC**, **TOUR-X**, **ECoVEM**, and **PROMOTE** support the Pact's focus on large-scale partnerships, lifelong learning, and skills anticipation.

TOUR-X, for example, is mobilising its CoVE network to create policy recommendations tailored to national and regional contexts, reflecting the importance of practical governance alignment.

Another example is the Observatory for Arts and Crafts established by the **MOSAIC** CoVE, a policy-relevant platform that connects students, professionals, and businesses across Europe. It showcases opportunities, monitors skills needs, and promotes lifelong learning, thereby supporting EU strategies such as the Pact for Skills, the Skills Agenda, and the Green Deal. By linking initiatives like Creative Skills Week and the Craft Tour, the Observatory further strengthens evidence-based policymaking and contributes to shaping EU recommendations on skills in the arts and crafts sector.

FEA-VEE is not only part of the Pact for Skills, but its partners are also active the **European Alliance for Apprenticeships**. In this regard, the CoVE is committed to making full use of all available tools and opportunities to promote the mobility of apprentices, particularly the Europass Mobility tools for learners taking part in international study visits.

Participation in **Blueprint Alliances** and related sectoral strategies is another recurring theme. **PROMOTE** draws on partner experience in Blueprint projects, while **Auto CoVE 2.0** aligns its training for EQF levels 4–6 with sectoral Blueprint priorities. **AILEEN** builds on a previous Blueprint for Additive Manufacturing, adapting its training to Aerospace and Defence sector needs. **TOUR-X**'s participation in the PANTOUR Blueprint project has broadened its stakeholder network, enabling stronger collaboration between VET and tertiary education partners and ensuring that outcomes are responsive to regional skills needs. Some of these CoVEs have also called for closer coordination with Blueprint initiatives to ensure coherent governance and more effective implementation of sectoral strategies across European regions.

Several CoVEs also demonstrate alignment with broader EU sector-specific strategies, contributing to the implementation of specialised policy frameworks. For example, **ECoVEM** is closely aligned with the objectives of the **European Chips Act**, participating in roundtables and industry clusters that shape the EU's microelectronics strategy and workforce development in this critical sector. Likewise, **EUVECA** engages with the **BeWell** project on the upskilling and reskilling of the European health workforce which is co-funded by Erasmus+ under the Pact for Skills and supports the EU's healthcare resilience strategy by promoting innovation in VET, including the development of digital badges and green upskilling initiatives tailored to healthcare professionals.

Last but not least, CoVEs emerge as key instruments for building the resilient and future-oriented skills ecosystems envisioned in the **Draghi and Letta reports**[22]. By bridging education and training, labour market demands, and research and innovation, they align VET with evolving economic and technological needs, thereby translating policy ambitions into practice. Their collaborative and cross-sectoral approach enhances the quality, relevance, and international connectedness of learning pathways, supporting Europe's transition toward a skills-based economy and strengthening its long-term competitiveness and social cohesion.

3.7. Success factors of the CoVEs: added value, potential for sustainability, scalability and transferability

The long-term impact of CoVEs depends not only on the quality and relevance of their outputs but also on their added value, as well as their potential for sustainability, scalability, and transferability. An in-depth analysis of selected CoVEs provides insight into how these projects are designing their approaches to extend beyond Erasmus+ funding cycles, to grow in reach and complexity, and to ensure that effective practices can be adapted to new contexts. These ambitions are met with varying levels of readiness and distinct challenges, depending on each project's design, funding model, stakeholder engagement, and sectoral context.

This is evident in the challenges highlighted in this report, such as in relation to partnership development (section 3.2.3), understanding of the concept of

[22] The Draghi report on 'The future of European competitiveness' (https://commission.europa.eu/topics/eu-competitiveness/draghi-report_en); and the Letta report on 'Empowering the Single Market to deliver a sustainable future and prosperity for all EU Citizens' (https://www.consilium.europa.eu/media/ny3j24sm/much-more-than-a-market-report-by-enrico-letta.pdf)

vocational excellence (section 3.5.4), and the recognition of micro-credentials and integration of curricula into NQF (sections 3.4.1 and 3.4.2).

3.7.1. Added value

The analysis of 25 Centres of Vocational Excellence (CoVEs) illustrates their substantial added value across the vocational education and training (VET) landscape in Europe. This initiative has proven instrumental in strengthening institutional capacity, improving learner outcomes, enabling industry collaboration, supporting policy implementation, and driving the modernisation of both VET systems and entire sectors.

Participating organisations in CoVE projects have experienced significant benefits from their involvement. **AILEEN** partners have benefited from close collaboration to develop specialised training content aligned with industrial standards in the Additive Manufacturing sector expanding its partnerships with public stakeholders such as the Dutch Army and the European Space Agency (ESA). **PROMOTE** has supported public institutions in the correctional sector by building integrated training models and transnational ecosystems that connect VET providers, justice authorities, and civil society. The **CATALYST** project leveraged the CoVE partnership to co-design 70 sustainability-focused courses, combining the multidisciplinary expertise and resources of VET providers, universities, companies, NGOs and professional organisations. Organisational capacity was further enhanced through platforms and governance tools, as seen in **EUVECA**, which created the Edu4Health platform to support simulation-based healthcare training and to enhance inter-regional collaboration in health-related skills, and **VOLTAGE**, which launched a Teachers' Forum for sharing resources and best practices in battery technology education and training.

For **students**, CoVEs have opened up access to high-quality, labour market-relevant training while also enhancing employability and entrepreneurial mindsets. In **3LoE**, students engaged in applied research within SMEs, contributing to real business challenges and benefiting from entrepreneurship training and green business idea competitions. **Auto CoVE 2.0** equipped students with technical knowledge in electric and hydrogen vehicles, advanced driver assistance systems, and battery disassembly through mobility programmes and innovative methods such as Virtual Reality-based training. In **ECoVEM**, students were provided opportunities to conduct research alongside industry partners, particularly in microelectronics, enhancing their practical skills. **FEA-VEE** facilitated international study visits for over 60 students across six countries, helping them build both technical and intercultural competences. Several projects, including **GIVE** and **PROMOTE**, focused specifically on improving inclusion in VET by designing targeted learning models for disadvantaged learners or learners in the justice sector.

Teachers and trainers have also benefited from enhanced professional development opportunities through CoVE projects. **EULEP**, for instance, developed high-quality, demand-driven training materials based on comprehensive skills intelligence and received overwhelmingly positive feedback from over 400 trainers during its pilot phase. **AI4VET4AI** enabled educators in both VET and tertiary education to jointly develop and pilot digital learning modules in Artificial Intelligence, while **MOSAIC** supported arts and crafts educators with operational training in digital tools. In **VOLTAGE**, trainers accessed digital and in-person upskilling programmes in Gothenburg's Battery Centre. Cross-country exchanges were particularly impactful in projects such as **AEDIL**, which allowed dairy teachers to observe modern practices abroad, and **Care about IT**, where teacher exchanges in the domain of healthcare and IT helped foster a culture of innovation.

Companies have found CoVEs valuable for shaping training content, addressing skill gaps, and securing access to a skilled and future-ready workforce. This is the case for **H2CoVE** where company feedback informs curriculum design for hydrogen technologies, and for **AGRIFOOD4FUTURE** where agri-food businesses contribute to curriculum development and gain access to graduates trained in key sectoral skills. The **CATALYST** and **SHOREWINNER** projects supported SMEs in sustainability-oriented sectors through research cooperation, workforce development, and innovation-driven training. By integrating emerging technologies, CoVEs also benefit companies by enhancing productivity and drive sector transformation. **AEDIL** advances sustainability in the dairy sector through plant-based production and green technologies; **Talentjourney** applies AI and AR/VR to smart manufacturing via challenge-based Demo Labs; and **EULEP** supports advanced manufacturing by training C-VET learners in IoT, AI, and VR with Smart VET Strategies for company upskilling.

Education and training institutions, including VET providers and universities, have enhanced their training quality and strategic alignment through CoVE participation. **AI4VET4AI** broke down institutional silos by bringing vocational and academic institutions into a co-development process for AI curricula, now being embedded into institutional strategies. Similarly, **EUVECA** fostered alignment between healthcare VET providers and universities by co-creating teaching materials and simulation centres, also breaking down silos between education and the world of work within the healthcare sector. In **MOSAIC**, innovation centres jointly operated by VET schools and enterprises in Canada—where teachers and students participate in research activities for SMEs—have been identified as a promising practice with significant potential for replication in European education and training institutions. The presence of such collaborative structures across multiple countries has helped reposition VET as an integral part of broader education, training and innovation ecosystems.

From a **policy perspective**, CoVEs have contributed substantially to the implementation of EU, national, and regional policy goals, as covered in Section

3.6. **EULEP** has developed its action-oriented Smart VET Strategies at regional levels via VET councils which include public authorities. **EPLUG** stands out for its direct policy influence achieved through active collaboration with public authorities at multiple governance levels: the project proposed 26 policy recommendations, contributed to changes in the EU Nature Restoration Law, and supported new qualification development in Romania. **PROMOTE** helped bring VET to the forefront of justice sector reform by working directly with justice authorities (ministries and prison services) ensuring that upskilling and professional development align with policy priorities in correctional systems.

At the **sectoral level**, CoVEs have proven essential for driving transformation. In **CATALYST**, a multidisciplinary consortium covered sustainability and management topics across EQF levels, helping organisations embrace the role of education and training providers and contributing to systemic change in green transition efforts. **SHOREWINNER** aligned offshore wind training with regional development and innovation strategies, while **FEA-VEE** promoted low-cost, digital tools like 3D printing to support sustainable manufacturing in the fashion and textiles sector. **Talentjourney** developed sector-specific challenge-based learning in IoT and smart manufacturing, contributing to the responsiveness and adaptability of education and training systems.

In conclusion, in terms of added value the CoVE projects foster high-quality, inclusive, and innovation-driven vocational education and training by integrating diverse actors into emerging skills ecosystems. Their contributions span all levels – from learners and trainers to institutions and sectors.

3.7.2. Potential for sustainability

This theme explores the critical steps CoVE projects must take to sustain and extend their impact beyond the lifecycle of Erasmus+ funding. Erasmus+ requires projects to:

… include the design of a long-term action plan for the progressive roll-out of project deliverables after the project has finished. This plan shall be based on sustainable partnerships between education and training providers and key labour market actors at the appropriate level. It should include the identification of appropriate governance structures, as well as plans for scalability and financial sustainability.[23]

Ensuring long-term relevance requires not only embedding education and training innovations and partnerships into systemic frameworks but also establishing robust operational and financial models. Several CoVEs have

[23] https://erasmus-plus.ec.europa.eu/programme-guide/part-b/key-action-2/centres-vocational-excellence

demonstrated strong institutional and operational potential for sustainability beyond the Erasmus+ funding period.

For instance, **3LoE** developed a clear dissemination and business strategy to extend the life of its outputs, with policy recommendations and engagement across 14 countries to secure future use and political support. Furthermore, 3LoE developed dual VET and bachelor's programmes across several countries, aligning with national reforms and involving VET schools and universities to institutionalise curricular innovations.

Another completed project, **ECoVEM**, continues to deliver and update the training courses developed during its implementation, with new editions already planned for 2025 beyond the project's official end. The partnerships established with industry, policymakers, other CoVEs, and the European Commission also remain active through regular monthly meetings. All partners continue to contribute to training delivery and are now involved in new national and European VET initiatives in microelectronics.

At the current stage, **AI4VET4AI**'s potential financial sustainability is supported indirectly by partners' strategic integration of AI-related training content into their core institutional offerings. The HEIs involved in the AI4VET4AI CoVE are embedding the developed MOOCs, AI modules, and learning content into regular curricula, while VET providers are adapting materials for future training delivery ensuring continued use beyond the project lifecycle.

Several projects are actively addressing the need to create diversified funding models, exemplifying how transnational alliances and stakeholder networks can support sustainability by broadening access to funding and securing policy-level recognition. Most CoVEs are considering in particular financial sustainability once the period of Erasmus+ project implementation has ended. **AILEEN** is developing a business model involving access fees and sponsorships, with stakeholders negotiating differentiated rates to ensure sustainability while keeping affordability in mind. **Auto CoVE 2.0** plans to sustain its micro-credential modules post-project via a partial fee-based model, while also ensuring open-access dissemination through international platforms. To support its long-term financial sustainability, **AGRIFOOD4FUTURE** has established a dedicated working group and explored monetisation of its training services alongside structural partnerships with industry actors and national stakeholders, as well as the use of EU-level initiatives such as the CoVE Community of Practice (CoPCoVE) and the Pact for Skills to stay updated about funding opportunities and facilitate knowledge exchange.

Some initiatives are directly integrated into existing organisational structures. **AEDIL** benefits from its alignment with a long-standing network in the dairy sector; it has built a transnational community of practice (CoP) through its Dairy Hub and Dairy Academy, connecting professionals across countries and sectors, fostering knowledge exchange between VET and higher education, and

expanding participation in its research symposium from around 30–40 to 300 participants, with the Dairy Hub expected to be sustained through member contributions. **GIVE** has successfully institutionalised modules on inclusive pedagogies in regions of Italy and Romania, supported by its digital learning platform and associated CoP, which extend the project's reach and enable cross-country sharing of tools and practices among VET and pedagogy practitioners committed to inclusive vocational excellence. However, some projects also recognise challenges that threaten their financial or operational continuity. **CATALYST**, despite its broad reach, anticipates difficulties in maintaining a non-commercial model and sustaining regular updates to content without future funding. **EPLUG** projects in Finland and Spain also report pressures in sustaining VR learning tools and staff engagement due to national funding constraints. While **EUVECA** and **MOSAIC** are exploring business models and partnerships for ongoing platform use, the absence of immediate revenue streams remains a barrier. Moreover, **PROMOTE** and **SHOREWINNER**, while still in their initial stage of their projects, point out that some elements of their models are heavily dependent on continued public or donor funding to retain functionality, particularly at the transnational level.

The sustainability of CoVEs depends on how well they are embedded in regional or national systems, their strategic alignment with broader policy agendas, and their ability to secure continued stakeholder engagement and resources. CoVEs that are anchored within national structures (e.g., **VOLTAGE**, which is integrated at national level into the *Teknikcollege* framework in Sweden), benefit from structural continuity that enables their activities to continue beyond the Erasmus+ project funding period.

Strategic alignment with EU and national priorities, such as the green and digital transitions, reinforces the long-term relevance of CoVEs and improves prospects for future funding from alternative sources. However, many CoVEs struggle to maintain momentum after the initial project ends. A key reason is the reliance on project-based funding, which can make it challenging to ensure the long-term institutionalisation of CoVE activities.

In summary, while operational and financial sustainability prospects are positive for many CoVEs, often supported by institutional embedding, hybrid business models, and diversified partnerships, the need for structured governance and consistent co-financing mechanisms remains a shared challenge. Projects often rely on continued engagement from public authorities or businesses to uphold operations, while some aim to acquire more maturity to develop an independent financial model.

3.7.3. Potential for scalability

This theme examines the extent to which CoVE projects' practices are scalable. It covers the factors relating to the potential of CoVE projects to roll out successful

approaches (such as education and training programmes or cooperation models) developed in one region and implement them in regions or institutions within the same country, with the possibility of mainstreaming these practices at the national level.

The CoVE projects reviewed have shown some potential for scaling their models, content, and partnerships. Several CoVEs adopt modular training structures, digital learning platforms, and open educational resources, which allow for straightforward expansion. **PoVE Water Scale-up**, for example, grew from five countries and 13 partners to seven countries and 23 partners, using a decentralised regional 'captain' model for coordination to manage the network's international growth effectively.

Talentjourney and **AI4VET4AI** demonstrated high adaptability by aligning training content with EU frameworks (DigComp, GreenComp, ESCO) and making outputs open access. This enables other institutions and sectors to reuse materials with minimal modification. Likewise, **CATALYST** courses have already been integrated into training offerings in Austria and Portugal and are under discussion with ministries in Germany and Greece, highlighting how content designed on transversal themes – such as sustainability and ESG (Environmental, Social, and Governance) reporting – can support expansion.

Other projects have scaled through ecosystem models. **AILEEN** aims to grow its network from eight to at least sixteen CoVEs, using fee-based membership and shared frameworks. **SHOREWINNER** leveraged a network of national CoVEs to facilitate the scaling of its offshore wind curriculum and stakeholder engagement model. **Auto CoVE 2.0**'s practical training modules are designed for easy adoption in different countries, and are being translated into nine languages, for wider dissemination, reaching over 4,000 technical schools via Electude's interactive learning platform and global network[24].

Nonetheless, scalability is often constrained by contextual barriers. Resource limitations, particularly in maintaining technology-intensive outputs (e.g. Virtual Reality – VR), pose obstacles, as noted by **EPLUG** and **FEA-VEE**. The need for translation and local curriculum alignment also slows expansion, particularly in projects such as **CATALYST** and **TOUR-X**, where content is sophisticated or dependent on regulatory adaptation. In some cases, scalability is limited by difficulties in expanding industry networks: **INVESTech**, for example, notes that further scaling hinges on successful piloting of micro-credentials and deeper engagement from industry.

Scalability is a recognised strength across the CoVE landscape, particularly where modular, digital, and collaborative designs are in place. However, it is constrained by fragmented funding, differences in national education and training

[24] For more information: https://www.electude.com/

systems, national policy regulations for formal recognition of new qualifications and micro-credentials, as well as linguistic and cultural barriers. Addressing these challenges requires a more coherent policy and funding approach that supports both the development of new CoVEs and the expansion of existing ones, ensuring their innovative practices benefit the broader VET ecosystem across Europe.

Successful scalability also requires greater coordination between CoVE initiatives. The diversity in how CoVEs are structured in countries and regions makes transferring models or results difficult. A more standardised framework for cooperation, longer funding cycles, and guidance materials adapted to national contexts – addressing regulatory barriers such as qualification recognition or curriculum integration – would enhance CoVEs' potential for scalability. Including examples of good practices, demonstrating how CoVEs have scaled up through cooperation with national authorities could help new projects build on previous efforts rather than repeating them.

Synergies with national CoVEs and other VET excellence initiatives would also further enhance the scalability of Erasmus+ CoVE projects. In the Netherlands, for example, most national CoVEs are able to sustain their activities but require additional funding to scale up and involve more partners, such as companies and schools. As with small-scale cooperation partnerships, dedicated simplified funding arrangements should be made available to support the participation of national and regional CoVEs in ongoing Erasmus+ CoVE projects, without requiring the creation of new projects. This follows reports of interest from French and Italian CoVEs in joining the **PoVE Water Scale-up** project.

3.7.4. Potential for transferability

Transferability is a central aim of many CoVE initiatives, with a majority developing tools, methodologies, and governance models that are explicitly designed to be reused in other national contexts or economic sectors. **EULEP**, for example, produced transnational training modules and implementation guides adaptable to local VET systems. **MOSAIC** developed six-language training content and advocacy kits tailored to stakeholder groups and is embedding its platform into EfVET's working group on Creative and Cultural Industries[25] to promote continued exchange.

Projects that emphasise **applied, flexible, and sector-neutral tools** are especially strong in this regard. **GIVE** produced counselling and governance frameworks aligned with EU quality assurance standards (**EQAVET**), which are

[25] EfVET: European Forum of Technical and Vocational Education and Training. For more information on the Creative and Cultural Industries working group: https://efvet.org/cultural-and-creative-industries-wg-a-new-initiative-of-efvet-in-synergy-with-mosaic-coves-project/

being promoted by **EfVET** to countries lacking strong inclusion-oriented VET models. **AILEEN**'s combination of academic-industry cooperation, applied research, and cross-border certification creates a robust model for innovation hubs that can be transferred to similar settings. **H2CoVE**'s international approach supports knowledge sharing between mature and emerging hydrogen regions and has already extended to countries such as India and South Africa.

Several projects demonstrate successful early-stage transfer. **FEA-VEE** translated materials into multiple languages (including Italian and Greek), enabling uptake in countries such as Cyprus and Italy who were not partners in the project. **TOUR-X** designed tools and curricula that can be easily integrated into existing systems, particularly by private providers. In **PROMOTE**, modular tools for the recognition of prior learning were designed to align with various adult education systems, making them viable in sectors beyond justice, such as social care or addiction treatment.

Yet, challenges can persist as transferability often requires local champions and adaptable tools. **PoVE Water Scale-up** acknowledges that models developed in sparsely populated areas may not apply directly to more urbanised contexts such as Malta. **SHOREWINNER** similarly notes that while its Community of Practice (CoP) model is highly replicable in regions with offshore energy potential, the engagement effort and resource intensity may limit its feasibility elsewhere.

In summary, the CoVEs offer considerable potential for transferability, particularly where content is modular, methods are transdisciplinary, and partnerships are open-ended. Still, effective transfer requires deliberate adaptation mechanisms, linguistic support, and contextual relevance.

4. Conclusions

The CoVE projects reviewed have demonstrated a wide spectrum of impacts on education and training, labour markets, innovation ecosystems, and policymaking environments. The evidence across the cases analysed shows that the CoVE projects are much more than projects operating in isolation of wider systems. Instead, they can act as structural enablers for transformation in VET, with transversal benefits extending into sectoral modernisation, policy reform, and cross-border collaboration.

In this context, CoVEs are strategic drivers of resilient and future-proof skills ecosystems, as envisioned in the Draghi and Letta reports. The Draghi Report identifies skills shortages and the misalignment between training and labour market needs as major barriers to Europe's competitiveness; CoVEs directly address these issues by offering high-quality, relevant vocational education and lifelong reskilling opportunities. The Letta Report emphasises the need for a stronger, more dynamic single market — and CoVEs contribute by fostering cross-border vocational excellence, innovation partnerships and recognition of skills across countries.

Through a strategic, multi-stakeholder approach that brings together partners from education and training, business, and research and innovation, CoVEs ensure that VET remains agile and relevant – continuously adapting to Europe's evolving economic and technological landscape.

This final section draws out the overall conclusions from the analysis and offers recommendations for future developments, drawing on both the case studies and the discussions of the online workshop held on 5 June 2025 as well as the challenges highlighted throughout the report. The lessons learned highlight the critical success factors and cautionary insights necessary to build on these achievements.

4.1. Overall impacts and recommendations

Impact on education quality, curriculum innovation, and skills alignment

Enhancing the quality of vocational education and training is at the heart of the CoVE projects and they achieve this through innovations both around how skills needs are identified and around the processes of curriculum and pedagogical development and the form of programmes and qualifications.

Many CoVEs have set new sectoral standards by VET-HE co-development of sector-specific curriculum content aligned with employer needs at

different EQF levels to address current and future workforce demands. Modular approaches to programme and qualification development – including micro-credentials – are common across CoVEs supporting flexible, learner-centred skills development.

While the flexibility of micro-credentials and modular training is a promising avenue, issues around their widespread formal recognition is still a barrier in many systems since each country has its own set of standards, regulations, and education and training frameworks. There is a need for a more unified approach to ensure that micro-credentials are recognised and valued equally in different countries and the Council Recommendation for a European Approach to Micro-credentials has been designed to support such an approach.

Many CoVEs have pioneered new pedagogical methods, such as immersive learning and hackathon-based learning tackling industry challenges, often leveraging new digital technologies. Some CoVEs already demonstrate strong impacts in educational innovation through measurable outcomes. However, sustaining and scaling-up such innovations often requires significant investment in teacher training, digital infrastructure, and curriculum alignment with national frameworks.

Core CoVE activities around education and training quality are contributing to the emergence of further ideas around vocational excellence. Indeed, there is a growing consensus among CoVEs that vocational excellence entails providing inclusive, relevant, and future-oriented learning experiences. This means connecting education and training to real social, economic and environmental challenges and fostering skills that empower both youth and adults through co-creation with policymakers, education and training professionals, researchers, and civil society organisation.

CoVEs embody the fact that vocational excellence is not an extracurricular activity but a core element, embedded by design into VET provision and quality assurance. Significantly, vocational excellence is also about creating a learning environment that is inclusive and accessible to all learners, regardless of their background or circumstances. A number of CoVEs and their activities exemplify this dimension of vocational excellence, demonstrating its practical relevance for diverse learner groups.

Recommendations: *Innovations in teaching and learning are central to CoVE projects. Co-creation with industry, integration of digital tools, and openness to pedagogical innovation are crucial to raising the quality and relevance of VET. However, scaling these innovations often requires significant investment in teacher training, digital infrastructure, and curriculum alignment with national frameworks, necessitating the engagement and support of policymakers and further cooperation on micro-credentials and transparency and recognition of qualifications. To support this, the European Commission could strengthen linkages between CoVE initiatives and broader EU frameworks such as the Pact*

for Skills and the European Alliance for Apprenticeships, which offer valuable networking opportunities with companies and public authorities. Additionally, closer collaboration with bodies like the Advisory Committee on Vocational Training, Public Employment Services, Erasmus+ national agencies, and relevant services within EU institutions, could help embed innovative practices into formal education and training systems and ensure that curriculum development is aligned with evolving national and European skills agendas. Innovation in teaching and learning is also a factor of attractiveness and many of the CoVE projects reviewed report impressive statistics regarding outreach to learners. However, the longer-term impacts on occupations and sectors are currently unclear. Further monitoring and evaluation of outputs and wider impacts should be undertaken in the coming years, including around issues of inclusion. The ISATCOVE tool developed by ETF should be widely promoted as a means for CoVEs to self-assess their activities and identify areas for improvement to impact on the modernisation and elevation of VET quality standards.

Enhancing employer, learner and worker participation

Employer participation is central to all CoVE projects, particularly in identifying skills needs and designing VET programmes. However, engagement can be challenging, particularly in sectors with weaker traditions of employer involvement in VET programme design or dominated by SMEs with limited resources. The findings highlight how CoVEs have developed a range of approaches to encourage and secure employer involvement in their activities, often engaging them in skills anticipation and the design of learning materials.

While employer engagement is a standout feature of CoVEs, the level of engagement among learners and workers remains limited. Learner-centred pedagogical development is a key activity, but learners are mostly treated as beneficiaries rather than active participants in curriculum co-creation and other project activities. Similarly, workers' representative organisations are reportedly less frequently involved in CoVEs compared to employers' organisations.

Recommendations: *CoVE projects would benefit from support to enable them to share experiences and good practices around engaging employers, learners and workers and their representatives in curriculum development and other project activities. CoVEs should be encouraged to set up permanent mechanisms with the aim of establishing shared ownership of activities, while bearing in mind national/regional legal requirements around the distribution of roles and responsibilities within VET systems.*

Strengthening skills ecosystems

A defining feature of CoVEs is their ability to foster structured ecosystems of cooperation between VET providers, companies, policymakers, and, in some

cases, civil society. The success of skills ecosystems, as shown by CoVEs, depends on a combination of trust, clarity and collaboration that supports co-creation, adaptability and inclusiveness. Together, these factors ensure resilience and lasting impact.

Mutual trust underpins effective partnerships, while clearly defined roles prevent overlap and ensure each actor contributes meaningfully. Regular communication and the involvement of learners, workers and employers in project design further strengthen alignment and relevance.

Adaptability is essential, particularly in international settings, where shared leadership allows ecosystems to respond to emerging challenges and opportunities. Respecting cultural differences enhances cohesion, while fostering a sense of ownership among stakeholders drives long-term commitment.

A key challenge lies in aligning the pace and language of education and training providers and companies. Differences in operational tempo and terminology can create barriers, making coordination and dialogue critical.

***Recommendation**: Multi-actor collaboration is a key driver of impact, but it must be underpinned by clear governance, mutual incentives, and shared long-term vision. It is important that CoVEs pay attention to the challenges inherent in building or enhancing skills ecosystems and find appropriate solutions. Peer learning could help in these processes, with new CoVEs learning from long-established CoVEs. The European Commission should support such peer learning through appropriate European support mechanisms, both through Erasmus+ and working with the existing CoVE Community of Practice (https://www.copcoves.eu/).*

Contribution to the green and digital transitions

CoVEs have been instrumental in embedding green and digital innovation into VET systems. Some projects demonstrate how CoVEs serve as incubators for the twin transitions, particularly by advancing the digital transformation of VET through their focus on sectors driven by cutting-edge technologies. Importantly, several CoVEs addressed the gender imbalance in STEM fields by making these sectors more appealing to underrepresented groups.

CoVE projects generally place strong emphasis on digitalisation, while the green transition receives comparatively less attention. This reflects broader economic trends, but it also carries some implications for skills development. A strong focus on digital innovation may mean that sectors with limited digital potential but high employment growth – such as elderly care – may be less prioritised.

Similarly, while new green sectors like renewable energy feature in many initiatives, less emphasis is given to the systematic integration of sustainability

competences (such as knowledge and skills around recycling) into all occupations. Embedding such competences more broadly is increasingly important given the cross-cutting nature of climate change. In addition, attention to emerging "new" green occupations can sometimes overshadow the equally critical roles needed in existing sectors. For example, the dangers posed by both rising temperatures and increased flood risk require major investments in infrastructure adaptation and maintenance which in turn require significant skills development investments. The green transition requires holistic actions across the whole spectrum of the economy.

Overall, while CoVEs contribute significantly to digital transformation, a more balanced focus could help ensure that sustainability and resilience are embedded across a wider range of sectors and occupations. In addition, positioning VET as a proactive player in the green and digital transitions requires content that is not only technologically current but also socially inclusive. The flexibility of micro-credentials and modular training is a promising avenue, though widespread formal recognition is still a barrier in many systems.

Recommendation: *All these aspects could be addressed in future rounds of Erasmus+ project calls by emphasising the importance of establishing CoVEs across the economy – not just those experiencing intense innovation – and in promoting the need for broad sustainability competences to be integrated into all learning and training programmes designed by CoVEs across a variety of sectors. In this way, the benefits that CoVEs bring can be made available to learners, workers and companies in all sectors.*

Influencing policy and wider systems

CoVEs can inform policy design by demonstrating tangible, evidence-based impact that can guide policy decisions and highlight best practices. These best practices can be scaled up or adapted to other regions or sectors, while simultaneously helping national policymakers engage and align with EU priorities.

Several CoVE projects have engaged with policy development or influenced structural change, for instance by informing EU and national policy frameworks, updating or creating new qualifications, and strengthening the strategic and operational capacity of VET systems. Many also seek to establish lasting coordination and knowledge-sharing mechanisms to support evidence-based policymaking across sectors.

While CoVEs can inform wider policy design, several conditions are required for this to be achieved, and CoVEs can face obstacles in this regard. Firstly, engaging policymakers early on is essential for ensuring that the initiatives and outcomes of CoVEs are aligned with broader national and EU priorities. This early engagement helps to build trust and collaboration between CoVEs and policymakers, facilitating a more seamless integration of CoVE outcomes into

policy frameworks. Involving public authorities from the outset allows for a better understanding of the policy landscape and ensures that CoVE initiatives are designed to address specific policy goals and challenges.

However, structured communication between project implementers and national policymakers is often lacking. Without formal mechanisms or a culture of policy-level engagement, even projects that deliver meaningful results and outputs may fail to achieve broader and long-term impacts. Therefore, capacity-building for both educators and decision-makers is essential. Educators should learn to effectively communicate policy, while decision-makers need greater exposure to and involvement in innovation. Establishing these connections early and intentionally during project implementation is crucial for ensuring sustainability and fostering reform.

A key challenge is the mismatch between the relatively short project cycles of CoVEs and the longer policy processes. CoVEs often operate on shorter timelines, which can make it difficult to demonstrate long-term impacts and sustainability within the duration of a single project**. It is important to develop strategies to bridge this gap, such as creating mechanisms for ongoing monitoring and evaluation, and establishing long-term partnerships with policymakers to ensure continuity and support beyond the project lifecycle.**

Additionally, aligning CoVE initiatives with national and EU priorities is crucial for maximising their impact and relevance. It is important that CoVEs stay informed about current policy trends and priorities and design their projects in a way that supports these broader objectives. This alignment not only enhances the credibility and visibility of CoVEs but also increases the likelihood of securing policy support and funding for future initiatives

Recommendation: *CoVE projects can act as powerful policy laboratories when their outputs are closely aligned with national priorities. To maximise this potential, CoVEs should be encouraged to take a proactive role in shaping policy by producing targeted, evidence-based recommendations and practical tools that address sectoral and national needs. Their ability to influence policy depends on early engagement with public authorities, systematic evidence generation, and sustained advocacy. Projects that establish formal cooperation structures with ministries, local authorities, chambers of commerce, and public agencies tend to achieve stronger, system-level impact. For this reason, CoVEs need to consider how best to strengthen their capacity to influence VET systems more broadly, extending their reach beyond their immediate sectoral or occupational focus. Promoting CoVE successes to national and regional authorities is also critical, ensuring greater awareness of how their structures and processes can enhance VET quality. At European level, deeper integration with initiatives such as the Pact for Skills, the European Alliance for Apprenticeships, and the EQAVET network, the upcoming VET strategy can further support the scaling and embedding of CoVE innovations into wider policy frameworks.*

Sustaining and scaling up CoVEs

CoVE sustainability and scaling up involves a range of activities: embedding the outputs of CoVEs into mainstream practices; continued activities by partners and taking forward of lessons learned; and continuation of new processes and structures. A range of factors and conditions are important in enabling sustainability and scaling up. Stakeholder commitment is crucial since the active involvement and support of all stakeholders, including VET providers, businesses, research organisations, and public authorities, ensure the long-term success and impact of CoVEs. Some projects have reinforced stakeholder engagement through communities of practice (CoPs).

Funding is another critical factor, as adequate financial resources are necessary to support the ongoing activities and expansion of CoVEs once Erasmus+ funding has expired. The case studies show that funding can come from three main sources: the public sector in the form of grants or budget lines; the private sector in the form of financial contributions; and through charging users for training services (either companies or learners). As far as contributions from the public and private sectors are concerned, ensuring income from these sources will depend to a significant degree on the CoVEs' demonstrated impact: showcasing the positive outcomes and benefits of CoVEs can attract further support and investment from stakeholders for activities that have proven their effectiveness and potential for scalability.

The sustainability and scalability of CoVEs can be enhanced by the forging of stronger linkages between CoVEs and national policymakers. Where such linkages are weak, effective collaboration to drive the reform of VET systems is hindered. **To ensure the success of CoVE projects, it is crucial to engage policymakers from the outset and secure continuous financial and institutional support. By linking CoVEs more evidently to EU policy priorities, their visibility and impact can also be significantly enhanced.**

Lastly, the broad CoVE Community of Practice, which brings together project coordinators from various COVEs to share experiences and address challenges collaboratively, plays a crucial role in advising on supporting the sustainability and scalability of CoVEs. One significant lesson from this initiative is that it enables CoVE coordinators to recognise and build upon the achievements already made by other CoVEs.

Recommendation: *To enhance the sustainability and scalability of CoVEs it is recommended to systematically connect Erasmus+ CoVEs projects with national initiatives, as well as with other initiatives like those led by National Authorities in charge of VET, Erasmus+ national agencies, the Excellence Network led by the European Training Foundation (ETF), and broader groups such as Public Employment Services. Also, the upcoming VET strategy in 2026, could unlock, among others, innovative opportunities for scaling up and future-proofing vocational excellence to further respond to European priorities.*

4.2. Strategic value and future directions

As the main findings in Chapter 3 have shown, CoVEs add value in a wide range of areas, as summarised in the box below. At the same time, the case studies indicate that the greatest strategic value can be achieved and sustained where there are changes in structures and processes. Such changes can provide lasting legacies beyond the projects which can continue to add value. In short, CoVEs can provide models for transforming VET that have general applicability beyond their own sectors and that help to avoid the problem of activity ending when project-based funding ends.

Overview of the impacts of Erasmus+ CoVE projects

The projects reviewed show that CoVEs can achieve a wide range of impacts. Depending on their particular goals and operational contexts, they have the ability to shape both practice and structures:

Practice impacts

CoVEs can:

- ✓ push VET into new areas and support the development of vocational excellence in sectors and countries where it was previously absent or under-developed while ensuring inclusive approaches (see Sections 3.1 and 3.2)
- ✓ set new standards in how to design and deliver joint transnational curricula through the co-creation of skills-orientated content through stakeholder participation, including through the involvement of businesses and public authorities (see Section 3.3)
- ✓ lead the way in their target areas and key sectors with innovations in skills needs identification, and the development of new programmes, qualifications and teaching and learning methods taking account of the impact of new technologies, such as AI (see Section 3.5)
- ✓ pioneer modular approaches to programme and qualification development, including micro-credentials (see Section 3.4)
- ✓ show how international mobility and transnational knowledge exchange should be at the heart of vocational excellence. (see Sections 3.6 and 3.7)

Structural impacts

CoVEs can:

- ✓ demonstrate that vocational excellence should be integrated into VET provision, rather than being a 'bolt on'
- ✓ act as structural enablers for transformation, changing the structures and processes through which VET is designed and implemented to make VET attractive, innovative and, inclusive.
- ✓ set up new or enhance existing skills ecosystems based on cooperation between VET providers, higher education institutions, the research community, companies, policymakers, and civil society
- ✓ impact not just on VET and related areas of education and training, especially tertiary education, but also on innovation and regional development systems through contributing to applied research
- ✓ influencing national/regional policy design by demonstrating tangible, evidence-based impact and by actively engaging with policy development or influencing structural changes
- ✓ have an on-going influence through building understanding, trust, and comparability towards absorption of new curricula and pedagogies into mainstream practice and the continuation of new collaborative arrangements – with industry, policymakers, other CoVEs, and the European Commission.

CoVE projects are expanding VET beyond traditional areas, transforming processes for the design of programmes and qualifications, and advancing innovative learning formats such as micro-credentials. In doing so, they consolidate and build on earlier conceptions of CoVEs, as outlined in the European Commission and European Training Foundation reports of 2019 and 2020 respectively[26], while enhancing the international dimension of VET collaboration.

CoVE projects have also supported the development of excellence initiatives in sectors where such efforts were previously absent, such as in the fashion industry – a field that had received little attention in European projects before the launch of the **FEA-VEE** CoVE in 2022 but has since attracted growing interest and new initiatives.

Beyond sector-specific advances, CoVE projects bring holistic value to VET by integrating diverse stakeholders and consolidating existing knowledge and tools into coherent frameworks. For instance, **AI4VET4AI** illustrates how coordinated, ecosystem-based approaches – exemplified by the creation of MOOCs and AI learning modules – can overcome fragmentation in skills development, demonstrating that pedagogical innovation must be coupled with institutional change.

The analysis of CoVE projects has also highlighted the importance of agility and continuous learning in their operations. For example, **AGRIFOOD4FUTURE** promotes the better exploitation of results acquired through other EU-funded projects and, rather than duplicating efforts, capitalises on existing knowledge and tools, integrating them into a coherent framework that enhances their value and impact, maximises the return on public investment and fosters systemic vocational excellence across the agrifood value chain.

Internationalisation is a defining strength, enabling CoVEs to embed mobility and knowledge exchange at the heart of their education and training models. The modular training and micro-credentials developed by the Erasmus+ CoVEs, reflect a shift toward more flexible, learner-centred skills development while ensuring work towards joint transnational programmes, as called upon also by the Union of Skills for the future. Innovation spillovers into green and digital transitions extend CoVEs' influence well beyond the education and training sector contributing to developing public-private partnerships, among others in key strategic sectors.

The CoVE model holds substantial promise for long-term impact, especially where outputs are embedded in institutional frameworks, supported by

[26] *Mapping of Centres of Vocational Excellence (CoVEs)*, Publications Office of the European Union, 2019, https://data.europa.eu/doi/10.2767/646482 ; *Centres of vocational excellence – An engine for vocational education and training development – An international study*, Publications Office, 2020, https://data.europa.eu/doi/10.2816/771725

sustainable revenue models, or are strongly aligned with national or regional policy priorities. Reflecting this strategic importance, Centres of Vocational Excellence are one of the main priorities endorsed by the Ministers responsible for VET from 38 countries in the Herning Declaration of September 2025, showing an opportunity to foster the necessary engagement at national system level.

Scalability is enhanced through modular content and digital platforms, although projects must address resourcing and local adaptation challenges. Transferability is well supported by open-access tools and EU-aligned frameworks, but continued investment in localisation and stakeholder engagement is vital. Building on their strengths, Centres of Vocational Excellence are well placed to further support future European priorities by strengthening public-private partnerships and advancing transparency and recognition of VET qualifications, in line with the Union of Skills.

Collectively, these findings confirm that CoVEs have the potential to act as catalysts for systemic transformation, capable of enhancing the agility, relevance, and inclusiveness of vocational education and training in line with the Council Recommendation of 2020 on VET, in Europe and beyond and contribute to the 2026 VET strategy announced in the Union of Skills. However, these findings also show that the sustainability and scalability of CoVEs can be challenged by limited coordination between VET stakeholders and policymakers, which may slow progress on system-level VET reforms. Engaging policymakers and public authorities early and ensuring their financial and institutional support are important to strengthening long-term impact.

Cross-national peer learning can help build shared understanding of how to put the concept of vocational excellence into practice. More explicit links to EU policy priorities can also enhance the visibility and relevance of CoVE initiatives to ensure vocational excellence reaches all corners of Europe.

Annexes

Annex 1: Project data extraction matrix

Annex 2: Interview topic guide for CoVE project coordinators and partners

ANNEX: CoVE case study reports (separate publication)

Annex 1: Project data extraction matrix

This annex presents the data extraction matrix that was developed to capture relevant information from the identified sources and to support the subsequent selection of case studies (see Section 2.1).

Basic project information	Thematic information	Activities by cluster	Results expected	Results achieved
Project name	Green transition / environmental sustainability	Cluster 1: Teaching and Learning	Teaching and Learning activities	Teaching and Learning activities
Project ID	Digital skills	Cluster 2: Cooperation and Partnerships	Cooperation and Partnership activities	Cooperation and Partnership activities
Erasmus+ database project URL	Industrial/SME strategy	Cluster 3 Governance and Funding	Governance and Funding activities	Governance and Funding activities
Project website URL	Inclusion of groups with fewer opportunities		Wider strategic aims, incl. complementarity with other relevant EU instruments	Wider strategic aims, incl. complementarity with other relevant EU instruments
Topic/sector (e.g., Green economy; Advanced Manufacturing	Integration into Skills Ecosystems		Complementarity with national-level excellence strategies in VET	Complementarity with national-level excellence strategies in VET
Programming period: 2014-2020 or 2021-2027	Integration into Knowledge Triangles			Evidence of project continuation post Erasmus+ funding
Status: Ongoing or Completed	Innovative partnerships			Potential for transferability
Project start and end dates	Quality assurance in teaching			
Erasmus+ grant amount				
Name of coordinating organisation				
Type of coordinating organisation				
Country of coordinating organisation				
Number of partner countries				
Partner countries				
Names of partner organisations				
Target groups (e.g., VET providers, companies)				

Source: ICF

Annex 2: Interview topic guide for CoVE project coordinators and partners

This annex presents the standard topic guide questionnaires that were used for interviews with CoVE project coordinators and partners (see Section 2.2)

Section	Question	CoVE project coordinators	Educators, pedagogues and experts	SMEs, employers and social partners	Regional/local authorities, policymakers	Project participants, civil society
Process: Roles and inputs of project partners	Please describe your involvement in the CoVE project	√	√	√	√	√
	Please describe the respective roles and inputs of the different types of partners within your CoVE projects. More specifically, in relation to the three CoVE Activity Clusters (1. Teaching and Learning; 2. Cooperation and partnerships; 3. Governance and funding).	√				
	How is your work on establishing and developing CoVEs (ecosystems) among actors at local, regional, national, and transnational levels progressing? What have been the challenges and success factors?	√				
	What was the model for developing partnerships across organisations and ecosystems, at the level of the CoVE consortium, and in the national/regional CoVEs?	√				
	How do you engage with relevant companies or employers, public authorities, social partners, and researchers and experts that are not partners of the project?	√				
	Please describe the role of the higher education institution(s) – if applicable – and the added value of the cooperation between higher education institutions and VET partners in the project.	√	√			
Skills development activities	What types of skills does your CoVE project cover? Transversal (yes/no - if yes, describe); Occupation-specific (y/n, if y, describe), Green and digital (y/n), STEM (y/n), Other (describe)?	√	√			
	Is the CoVE project making use of EU skills frameworks (e.g., DigComp, GreenComp) or tools? If so, which ones and to what extent? Please give practical examples	√	√			
	What innovative methods and pedagogies, if any, have been developed by the CoVE for learners and teachers?	√	√			√

Section	Question	CoVE project coordinators	Educators, pedagogues and experts	SMEs, employers and social partners	Regional/local authorities, policymakers	Project participants, civil society
Skills development activities	Is the CoVE project using emerging technologies as part of teaching and learning (e.g., AI/VR/AR)? Which ones and to what extent? Please give practical examples	√	√			
	Please describe in what way the CoVE project provides support for the professional development of teachers and trainers	√	√			
	Are the training materials developed by the CoVE projects publicly accessible? Where are they stored?	√	√			√
	Does your CoVE undertake any applied research and innovation activities? If so, please describe them and how successful they have been so far. If possible, please distinguish between applied research and innovation within VET (e.g. into teaching/learning methods) and applied research and innovation beyond VET (e.g. in terms of developing the skills for learners, teachers/trainers related to new products and services in the economy).	√	√	√		
	What innovations have been generated by your CoVE in terms of a) Teaching and Learning; b) Innovations in business processes and products	√		√		
Project outcomes: development of qualifications	To what extent has the CoVE project been successful in developing qualifications? Have any new or improved qualifications been developed by the CoVE as part of national qualification frameworks?	√	√			
	Does your CoVE develop any of the following: micro-credentials, joint modules or qualifications?	√	√			
	Does the CoVE work with national authorities for the recognition of qualifications, including transnational recognition? If so, how many were recognised and which ones?	√			√	
	Does the CoVE use or develop certificates relating to the private sector market or international organisations? If so, how successful has this activity been?	√		√		

Section	Question	CoVE project coordinators	Educators, pedagogues and experts	SMEs, employers and social partners	Regional/local authorities, policymakers	Project participants, civil society
	Does the CoVE include apprenticeship programmes, where at least 50% of the curriculum is delivered in a work environment through a formal written agreement? If so, is the CoVE considering joining or collaborating with the European Alliance for Apprenticeships (EAfA)? Are any of the project partners already members of EAfA? If yes, who? How successful have these activities been?	√		√		
	Has your CoVE developed training courses offered that have been integrated into the curriculum of the partner countries or is it extra-curricular? Does it lead to a recognised learning outcome or qualification for the student?	√		√	√	
Project outcomes: Enhancing the quality and attractiveness of VET	Has the CoVE project resulted in any tangible impact on VET systems at the local, regional, national levels?	√	√	√	√	√
	How is your CoVE project complementing and supporting national, regional or local strategies to enhance the quality and attractiveness of VET (in other words, "VET excellence")?	√			√	
	Has being part of a CoVE helped to formed stronger partnerships with key stakeholders and how has this helped to improve VET provision and skills development?	√	√	√	√	√
	Can you give concrete examples of how the CoVE has improved skills development, helped to address skills gaps and shortages?	√			√	
Project outcomes: Enhancing the quality and attractiveness of VET	Can you provide examples of upward convergence? Specifically, how has the CoVE partnership supported regions or countries with less advanced strategies to enhance the quality and attractiveness of VET (i.e. "VET excellence strategies") in making progress or 'catching up' in this area?"	√			√	
	How, if at all, does the CoVE project complement the implementation of other EU programmes with similar goals, such as Net-Zero Industry Academies, the Pact for Skills, the Blueprint Alliances for Sectoral Cooperation on skills, etc.? Do you or your partner organisations cooperate/take part in any of these initiatives?	√			√	
	On synergies: Do you have concrete examples, if any, on how your CoVE contributes to the implementation of EU strategies such as: a) European Green Deal, b) the new Digital Strategy, c) the Communication on attracting Skills and Talent, d) the new Industrial and SME Strategies, e) the Union of Skills initiative?	√			√	

Section	Question	CoVE project coordinators	Educators, pedagogues and experts	SMEs, employers and social partners	Regional/local authorities, policymakers	Project participants, civil society
Added value of the CoVE project: success factors, sustainability, scalability, transferability	What are the most significant benefits that the CoVE projects brought to the participating organisations overall? Any success stories? What are you doing now that you wouldn't have done without the CoVE project?	√	√	√	√	
	What are the most significant benefits to specific stakeholder groups (e.g. students, teachers, companies, in-company trainers)?	√	√	√	√	√
	Has the CoVE been conducive to the development of regional development strategies (or "smart specialisation" strategies), a "skills ecosystem" and/or "knowledge triangle"? (maybe provide an illustrative definition). What have been the benefits for your sector?	√		√	√	
	What benefits does the CoVE's international dimension bring to your work on vocational excellence?	√	√			
	To what extent and for what reasons is this CoVE project financially sustainable without Erasmus+ funding?	√	√		√	
	To what extent are: a) the collaborations developed through the CoVE project sustainable? and b) the outputs developed by the CoVE project sustainable?	√		√		
	To what extent and for what reasons are the outcomes of the CoVE project replicable or scalable and transferable to other contexts?	√	√	√	√	√
	What good practices can be identified about the cooperation between higher education and secondary VET?	√	√			
	What good practices can be identified about the cooperation between education and training providers and companies?	√				
	Overall, what do you see as the biggest achievement of the CoVE project?	√	√	√	√	√
	What do you foresee will be the overall impact of your CoVE project after the end of the funding period, and how do you work to make that happen?	√			√	

Source: ICF

ANNEX: CoVE case study reports (separate publication)

The 25 case study reports are included in a separate publication on the website of the Publication Office of the EU.

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