UNION EUROPÉENNE

Hybrid the future

Hybrid Education in Vocational Education and Training (VET)

2024-2-FR01-KA210-VET-000286835

A2: Methodology of hybrid education in VET schools

October 2025

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1 Introduction

A. HyVET Project

The main objective of the hyVET project is to prepare VET schools for the future of education by creating, testing and implementing a methodology for hybrid teaching in VET schools. More specifically, the project supports the transition of VET systems to the digital age through innovative teaching and learning solutions, while also promoting inclusion, accessibility, creativity and student engagement in hybrid learning environments. Special attention is given to learners facing barriers such as digital exclusion, economic difficulties and geographical remoteness. hyVET also seeks to strengthen cooperation between VET schools and relevant stakeholders in order to foster innovation and ensure continuity of education in changing circumstances.

hyVET project online page: https://hybridvet.ct.ws/

Vocational Education and Training is evolving rapidly in response to digital transformation, changing learner needs and the necessity for more flexible forms of delivery. In this context, hybrid education—combining face-to-face teaching with digital and remote learning approaches—represents a relevant and promising model for VET. It makes it possible to preserve the practical and hands-on dimension of vocational training while expanding access to digital resources, flexible learning pathways and more personalised support for learners. This approach is fully aligned with the project's priorities: digital readiness, resilience and capacity, innovation in VET, and increasing the attractiveness of VET.

This manual, *Methodology of Hybrid Teaching in VET Schools*, is one of the core outputs of the hyVET project. It is conceived as a practical methodological framework to support VET teachers, trainers, school staff and other relevant stakeholders in designing and implementing effective hybrid learning in vocational education. The manual introduces the foundations of hybrid education in VET and provides guidance on how to create structured, engaging and inclusive hybrid learning experiences. It also aims to strengthen pedagogical competences for combining face-to-face and distance learning in meaningful and effective ways.

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The manual is structured around key themes identified in the project application. It addresses the future of education in VET schools, the creation of successful hybrid learning environments, the characteristics of hybrid teaching models in vocational education, the role of companies and work-based learning in hybrid settings, and the importance of inclusion. It also explores the role and competences of VET educators, essential skills for modern teachers, the use of ICT and digital educational resources, and a knowledge bank of practical tools to support hybrid teaching and learning. In this way, the manual contributes directly to the wider hyVET objective of equipping VET professionals with concrete tools and strategies for high-quality hybrid education.

In addition to this manual, the hyVET project will also develop an online professional certification course for VET teachers and a learning style online test for hybrid VET learners. Together, these three complementary outputs form a coherent framework to support both VET staff and learners in adapting to hybrid education and benefiting from more flexible, engaging and inclusive vocational learning opportunities.

B. The partnership.

a. AGFE

AGFE is a French non-profit organisation based in Paris and active in European projects, social inclusion, training, employment support and local development. The organisation works with public institutions, local stakeholders and training actors, and has experience in projects related to innovation, inclusion and digital transformation. In the field of VET, AGFE contributes expertise in project coordination, training support and innovative educational approaches. Within the hyVET project, AGFE is the coordinating organisation. It leads **A1 Project Management**, ensures the overall coordination and monitoring of the project, and supports the administrative and reporting process. AGFE also leads **A4 Learning Style Online Test for Hybrid VET Learners**, hosts the first project management meeting in Paris, and organises promotion activities in France.

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b. Inspectoratul Scolar Judetean Constanta

ISJC is the Constanta County School Inspectorate in Romania, a public authority responsible for coordinating and monitoring education at regional level. It works closely with schools, teachers, students and institutional stakeholders, including in the VET sector. Thanks to its broad educational network and experience in teacher support, school management and dissemination, ISJC brings strong expertise to the partnership. In the hyVET project, ISJC leads **A3 Hybrid Teaching – Professional Certification Course for VET Teachers** and **A5 Promotion Activities**. It hosts the training of trainers in Romania, coordinates the communication and dissemination plan, supports the sharing and exploitation of results, and is responsible for the project website, visual identity and key dissemination materials.

c. Development and Innovation Association for European Culture and Education

DIA&ECE is a Turkish non-profit organisation based in Antalya and active in vocational education, innovation, entrepreneurship and European cooperation. The organisation works with schools, VET providers, public institutions and local stakeholders to promote modern, inclusive and innovative educational practices. It has relevant experience in training development, certification, educational innovation and Erasmus+ cooperation. Within hyVET, DIA&ECE leads **A2 Methodology of Hybrid Teaching in VET Schools**, one of the project's core results. It hosts the second project management meeting in Antalya, coordinates the project's pilot activities, and is responsible for risk management as well as quality assurance, control and evaluation activities. It also organises promotion activities in Türkiye.

C. National field research and Focus group sum up

a. The methodology

As part of the hyVET project, national field research and stakeholder consultation activities were carried out in order to better understand the current state of hybrid education in vocational education and training (VET) across partner countries. The purpose of this activity was to identify existing practices, key challenges, emerging needs, and opportunities related to the design and implementation of hybrid learning in VET schools. This work was essential

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to ensure that the *Methodology of Hybrid Teaching in VET Schools* would be grounded in real educational contexts and reflect the experiences of VET professionals and learners.

The research combined two complementary approaches. First, each partner conducted desk research at national level in order to review the general context of VET, the development of digital and hybrid education, relevant policies or frameworks, current practices, and the main barriers affecting implementation. Second, focus groups and stakeholder consultations were organised to collect qualitative insights from practitioners and actors directly involved in VET. These consultations made it possible to explore perceptions, expectations and concrete experiences related to hybrid learning, including both its pedagogical potential and its operational limits.

The objective was not only to describe the state of play in each country, but also to identify common trends across contexts. Special attention was given to issues that are particularly relevant to vocational education, such as the balance between theory and practice, the role of companies and work-based learning, access to digital tools and infrastructure, learner motivation, teacher preparedness, and inclusion of students facing geographical, economic or social barriers. In this way, the research provided an evidence-based foundation for the development of the following chapters of this manual.

b. Findings per partner

France

In France, the national field research shows that the VET sector has undergone a significant digital acceleration in recent years, particularly since the COVID-19 crisis. Hybrid and distance learning practices have expanded, supported by public reforms, funding mechanisms and innovation projects. At the same time, the French context reveals persistent inequalities in access to digital equipment, internet connection and digital confidence. The research highlights that hybrid learning is increasingly seen as a useful and realistic model for VET, but one that still requires stronger pedagogical structuring and clearer support mechanisms for institutions and staff.

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The French focus group confirmed that hybrid education is appreciated for its flexibility and inclusiveness, especially for learners who live far from the training centre or face transport difficulties. Participants underlined the value of combining synchronous and asynchronous learning and recognised that hybrid delivery can offer more autonomy and comfort to learners. However, they also stressed several major limitations: internet instability, weaker group interaction, fewer opportunities for individualised support, lower concentration during online sessions, and the risk of isolation when online learning becomes too dominant. Teachers also highlighted the importance of equipment loans, adapted digital tools and better training in engaging online pedagogy. Overall, the French findings suggest that hybrid learning is relevant and promising in VET, but only if it remains balanced, well prepared and strongly supported by inclusive measures and teacher training.

Romania

In Romania, the national field research shows that hybrid or blended learning in VET is not yet standardised at national level and remains largely dependent on local initiatives, school capacity and teacher commitment. Although a legal framework exists for online or hybrid delivery, implementation is still uneven, and technical disciplines pose specific challenges because much of vocational training requires physical presence in workshops, laboratories and real work environments. The Romanian research nevertheless shows growing interest in hybrid learning and identifies several relevant trends, including the use of e-learning platforms, open educational resources, digital simulations, flipped classroom approaches, project-based learning and gamified activities.

The Romanian questionnaires and focus group provide a detailed picture of both the potential and the limits of hybrid VET education. Students and teachers recognise advantages such as flexibility, accessibility, increased attractiveness through multimedia resources, time savings and digital skills development. At the same time, they point to major difficulties: lack of equipment, unequal internet access, limited student motivation, insufficient digital skills, lack of standardised platforms, and above all the difficulty of reproducing hands-on practice online. Stakeholders also stressed that successful hybrid teaching depends on strong parental

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support, motivated learners, well-trained teachers, better instructional design and the availability of adapted resources for technical disciplines. Companies involved in apprenticeships confirmed that digital tools are becoming more important, but also insisted that hybrid learning must complement rather than replace "learning by doing," workplace culture and direct professional mentoring.

Türkiye

In Türkiye, the national field research shows that hybrid learning in VET is increasingly discussed as a necessary response to digital transformation, changing learner needs and the need for greater flexibility, but it is still perceived as difficult to implement on a large scale in vocational education. The Turkish literature review highlights that blended and hybrid learning gained visibility especially during and after the COVID-19 period, yet their application in VET remains constrained by structural and pedagogical limitations. While some studies underline positive effects on accessibility, flexibility and the use of digital resources, they also stress that technical infrastructure problems, limited access in some areas, insufficient planning and the difficulty of transferring practical workshop-based learning to remote settings remain major barriers. Overall, the Turkish research suggests that hybrid VET has clear potential, but only if it is carefully planned and adapted to the realities of vocational education, with the needs of all stakeholders taken into account from the start.

The Turkish questionnaire and focus group findings confirm this mixed but evolving perception. The survey, completed by 37 vocational teachers—most of them working in vocational high schools—shows that all respondents had experience in both face-to-face and online teaching, but far fewer had practical experience with blended or hybrid education. Teachers recognised several strengths of hybrid learning, including flexibility, accessibility, continuity of education in extraordinary situations, support for digital skills and the possibility of maintaining student engagement through innovative approaches. At the same time, they identified major obstacles such as weak internet infrastructure, lack of devices and equipment, limited student access to technology, institutional and financial constraints, and the particular difficulty of teaching hands-on vocational subjects remotely. Many participants

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emphasised that practical courses should remain face-to-face and argued that hybrid models are only viable if technical conditions, teacher training and classroom environments are significantly improved. The findings also show that teachers need stronger competences in technology use, hybrid pedagogy and the organisation of varied activities, while students need support in terms of readiness, access and autonomy. Focus group results reinforced these concerns, particularly around technological inequality, adaptation difficulties, the challenge of correcting mistakes during practical tasks at a distance, and the risk of reduced collaboration when learners are remote. Overall, the Turkish findings suggest that hybrid VET is seen as innovative and potentially valuable, but still fragile in implementation; its success depends on stronger infrastructure, better-equipped learners and institutions, continuous teacher training, and a model that complements rather than replaces practice-based vocational learning.

c. Results and conclusions.

The national field research and focus group activities carried out within hyVET reveal a shared reality across partner contexts: hybrid education is increasingly recognised as a valuable and necessary approach for the future of VET, but its success depends on clear pedagogical, technical and organisational conditions. In France, Romania and Türkiye, stakeholders see hybrid learning as a way to increase flexibility, widen access, support learners facing geographical or mobility constraints, and strengthen digital competences among both students and staff. At the same time, the three countries highlight similar concerns related to unequal access to equipment and connectivity, difficulties in maintaining learner motivation and interaction online, and the challenge of adapting vocational and practice-based subjects to hybrid delivery.

Another important result emerging from the research is that hybrid VET cannot be reduced to simply putting existing content online. Effective hybrid education requires intentional instructional design, a balance between synchronous and asynchronous learning, adapted digital tools, multimodal resources, and pedagogical approaches that preserve interaction,

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practical engagement and inclusion. Across the three partner countries, the findings also show that teachers need specific support in digital pedagogy, course design, learner engagement strategies and the use of ICT tools suited to vocational education. In addition, the role of employers, tutors, school leaders and, in some contexts, families appears essential in ensuring continuity, relevance and equity in hybrid learning pathways.

The comparative findings also underline that hybrid VET must remain closely connected to the realities of vocational learning. While hybrid models can improve access, flexibility and continuity, they are considered effective only when they complement rather than replace hands-on training, workplace learning and direct pedagogical support. This point is particularly important in vocational contexts, where practical activities, demonstrations, technical guidance and professional interaction remain central to skills development.

Overall, this research confirms the relevance of the hyVET project and directly justifies the development of a structured methodology for hybrid teaching in VET schools. The evidence collected at national level shows that there is a strong need for a practical framework that helps VET institutions and professionals understand what hybrid education means in their context, what conditions make it effective, and how it can be designed in a way that remains pedagogically sound, inclusive and compatible with the practical nature of vocational learning.

These findings therefore provide the foundation for the next chapter, Understanding Hybrid Education in VET, which explores the concept of hybrid learning in greater depth and examines its key principles, benefits and challenges in vocational education settings.

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2 Understanding Hybrid Education in VET

2.1 Definition and core principles of hybrid education

Distance learning: definition and evolution

Education can be delivered through different modalities, the most traditional being face-to-face (F2F) learning, in which teachers and learners interact in the same physical space. Over the past decades, however, distance learning has progressively expanded as a result of technological developments, changing learner needs, and increasing demands for accessibility and flexibility in education and training systems.

Distance learning can be defined as any educational situation in which learners and educators are not physically co-present and where learning is mediated through instructional materials and communication technologies (Martin, 2003). These technologies may range from low-technology solutions, such as correspondence-based learning, to digital environments supported by online platforms, video conferencing tools and multimedia resources.

In vocational education and training (VET), distance learning offers important opportunities to reach learners who may face geographical, social or economic barriers to participation. It can also support learning continuity during periods of disruption and make training pathways more flexible. At the same time, distance learning in VET raises specific challenges, since vocational education often depends on practical activities, technical demonstrations and direct interaction with equipment, teachers and workplace environments.

Within the hyVET project, distance learning is therefore considered an important component of modern VET systems, but not as a stand-alone solution. Rather, it is one element of a broader pedagogical approach that must remain connected to practice, inclusion and quality learning experiences.

E-learning: definition and key characteristics

E-learning first emerged as a specific form of distance learning relying mainly on digital technologies such as computers, online platforms and audio-visual tools to support teaching

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and learning processes (Martin, 2003). While earlier definitions focused primarily on digital content delivery, contemporary understandings of e-learning are broader and more pedagogical.

Today, e-learning is understood as a digitally mediated learning environment that can support interaction, collaboration, learner autonomy, feedback and continuous assessment. It may include synchronous activities, such as live virtual classes, and asynchronous activities, such as recorded lessons, discussion forums, online quizzes and self-paced learning modules. Learning Management Systems (LMS), shared digital workspaces and communication tools are central components of many e-learning environments.

In the context of hyVET, e-learning is not viewed only as a technical solution, but as a strategic means to modernise VET practices and support more learner-centred and competence-based approaches. It can facilitate access to resources, strengthen continuity of learning, encourage collaboration, and support the development of digital competences among both learners and educators.

E-learning models and the hybrid learning approach

As digital education evolved, different pedagogical models emerged. Two broad models are often distinguished in the literature: blended learning, which combines online learning with face-to-face teaching while keeping classroom-based learning central, and fully online learning, in which all activities, communication and assessment are delivered remotely through digital environments (ViewSonic, 2021).

Although blended learning and hybrid learning are sometimes used interchangeably, the hyVET project adopts a more specific understanding of hybrid learning. Within hyVET, hybrid learning refers to a pedagogical model in which face-to-face and distance learning activities are intentionally designed as complementary parts of the same learning process. Learning outcomes, content, activities and assessment methods are distributed across both modalities in a coherent way, and digital tools are integrated into the learning design as meaningful supports for engagement, communication and progression.

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This distinction is especially important in VET. Hybrid learning is not simply a matter of adding online tools to existing teaching practices. It requires careful consideration of what should be taught in person, what can be delivered at a distance, and how the two modalities can reinforce one another. In vocational education, this means ensuring that theoretical input, digital activities, simulations, collaborative work, practical exercises and workplace-based learning are connected in a pedagogically sound way.

For the hyVET partnership, hybrid learning represents a flexible and scalable response to the realities faced by VET institutions in France, Romania and Türkiye. It offers opportunities to support innovation, improve accessibility, diversify teaching methods and maintain learner engagement, while also respecting the practical nature of vocational education. For the hyVET partnership, hybrid learning represents a flexible and scalable response to the realities faced by VET institutions in France, Romania and Türkiye. It offers opportunities to support innovation, improve accessibility, diversify teaching methods and maintain learner engagement, while also respecting the practical nature of vocational education.

➔ **Table: Main learning modalities**

Modality	**Definition**	**Strengths**	**Challenges for VET**
Face-to-face learning	Learning takes place in the same physical space	Direct interaction and practical supervision	Less flexible for remote or disadvantaged learners
Distance learning	Learning takes place without physical co-presence	Accessibility and continuity of learning	Reduced interaction and digital access barriers
E-learning	Learning supported by digital tools and platforms	Autonomy, online resources, communication	Requires digital skills and engagement
Hybrid learning	Intentional combination of in-person and remote learning	Flexibility, inclusion and pedagogical diversity	Must preserve practical learning and ensure coherence

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Core principles of hybrid education in VET

Based on the hyVET approach, hybrid education in VET can be understood through several core principles.

First, hybrid learning requires **intentional pedagogical design**. The combination of face-to-face and distance learning should be planned from the start, rather than improvised or added afterwards.

Second, it relies on the **complementarity of modalities**. Online and in-person activities should not duplicate each other, but should serve different and complementary learning purposes.

Third, hybrid education must remain **learner-centred and inclusive**. It should respond to diverse learner profiles, needs and constraints, including learners with limited digital access, learners living far from training centres, or learners requiring additional support.

Fourth, hybrid learning in VET must preserve the **link between theory and practice**. Digital learning can support preparation, reflection, simulation and follow-up, but practical training, technical skills development and workplace learning remain essential.

Fifth, hybrid education depends on **interaction, support and engagement**. Teachers must create opportunities for communication, collaboration, feedback and motivation across both learning environments.

Finally, effective hybrid learning requires **institutional and technological readiness**, including access to equipment, digital platforms, technical support and staff training.

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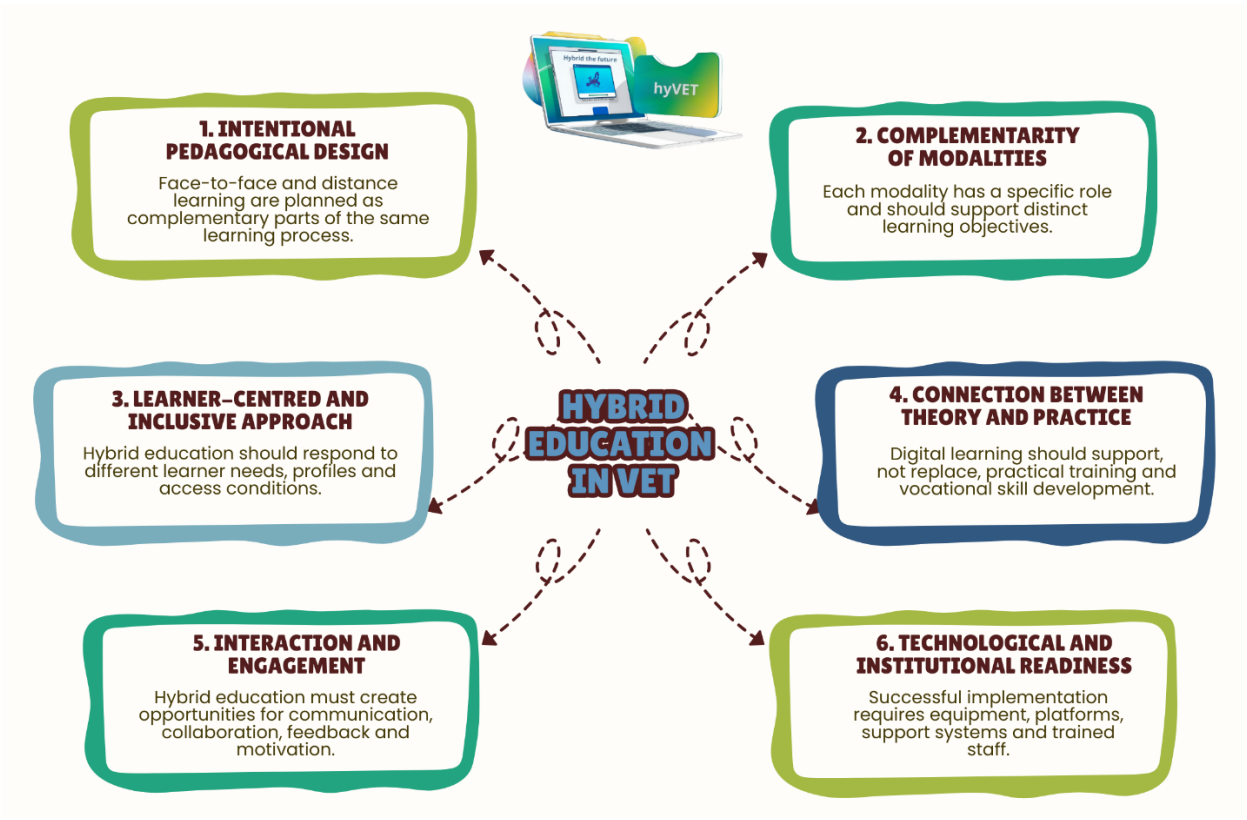

Implications for educator training and professional development

The effective implementation of hybrid learning requires strong pedagogical and digital competences among educators and trainers. According to UNESCO IBE (2021), professional development strategies should support teachers in designing, facilitating and evaluating learning experiences that combine face-to-face and distance modalities in coherent, inclusive and meaningful ways.

In the hyVET project, this implies supporting VET educators in designing hybrid courses aligned with learning outcomes, selecting and using digital tools in a pedagogically meaningful way, and adapting teaching practices to diverse learner profiles and national contexts.

By reinforcing these competencies, hyVET contributes to the development of more resilient, flexible and future-oriented VET systems across partner countries.

By strengthening these competences, hyVET contributes to the development of more resilient, flexible and future-oriented VET systems. This understanding of hybrid education

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provides the conceptual basis for the following sections of the manual, which further explore its benefits, challenges and practical implications for VET institutions and educators.

2.2 The hybrid educational model for VET institutions

For VET institutions, hybrid education is not only a teaching modality but also an organisational and pedagogical model that combines face-to-face and online learning in a coherent and structured way. It uses digital tools to enhance flexibility, interaction and learning effectiveness, while preserving the practical and work-based dimensions that are essential to vocational education and training.

A. Key principles of hybrid education

Hybrid education is not a single, fixed model but a **flexible framework** that VET institutions can adapt to their organisational structure, training offers and learner profiles. For this reason, understanding its key principles is essential, as these principles guide the design, implementation and quality assurance of hybrid training programmes.

For VET institutions, the key principles of hybrid education include:

- **Combination of face-to-face and online learning activities**, allowing institutions to balance practical, hands-on training with theoretical and preparatory learning delivered online. This helps optimise the use of training facilities and equipment while ensuring continuity of learning.
- **Use of digital tools to support interaction and collaboration**, enabling communication between learners, trainers and companies beyond the classroom. This strengthens cooperation, supports group work and facilitates feedback and monitoring.
- **Focus on learner engagement and active participation**, which is particularly important in VET settings where motivation and practical involvement are key

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to skills development. Hybrid approaches encourage learners to take an active role in their learning process.

- **Continuous interaction between learners and trainers**, ensuring guidance, support and feedback across both face-to-face and online environments. This helps prevent disengagement and supports individual learning paths.
- **Adaptability to institutional, pedagogical and contextual constraints**, allowing VET institutions to adjust hybrid models to their resources, national regulations, partnerships with companies and local labour market needs.

Knowing and applying these principles enables VET institutions to design **coherent, inclusive and effective hybrid training programmes**. It supports institutional innovation, improves training accessibility and quality, and helps institutions respond more effectively to changing educational, technological and labour market contexts.

B. Hybrid education in VET contexts

In vocational education and training (VET), hybrid education must respond to specific requirements such as skills development, practice-based learning and cooperation with companies. It is therefore not limited to combining physical and digital learning environments, but also involves ensuring that vocational knowledge, technical competences and workplace-related learning can be meaningfully developed across different modalities.

Within the hyVET project, hybrid education in VET settings is understood as follows:

- Some learners participate in face-to-face sessions in training centres or companies
- Other learners participate online, either synchronously or asynchronously
- Trainers teach and support both groups at the same time or alternately, using ICT tools
- Learning activities are designed to ensure equivalent learning outcomes, regardless of the mode of participation

This model allows learners to join training sessions either in person or remotely, depending on their situation, without compromising learning quality.

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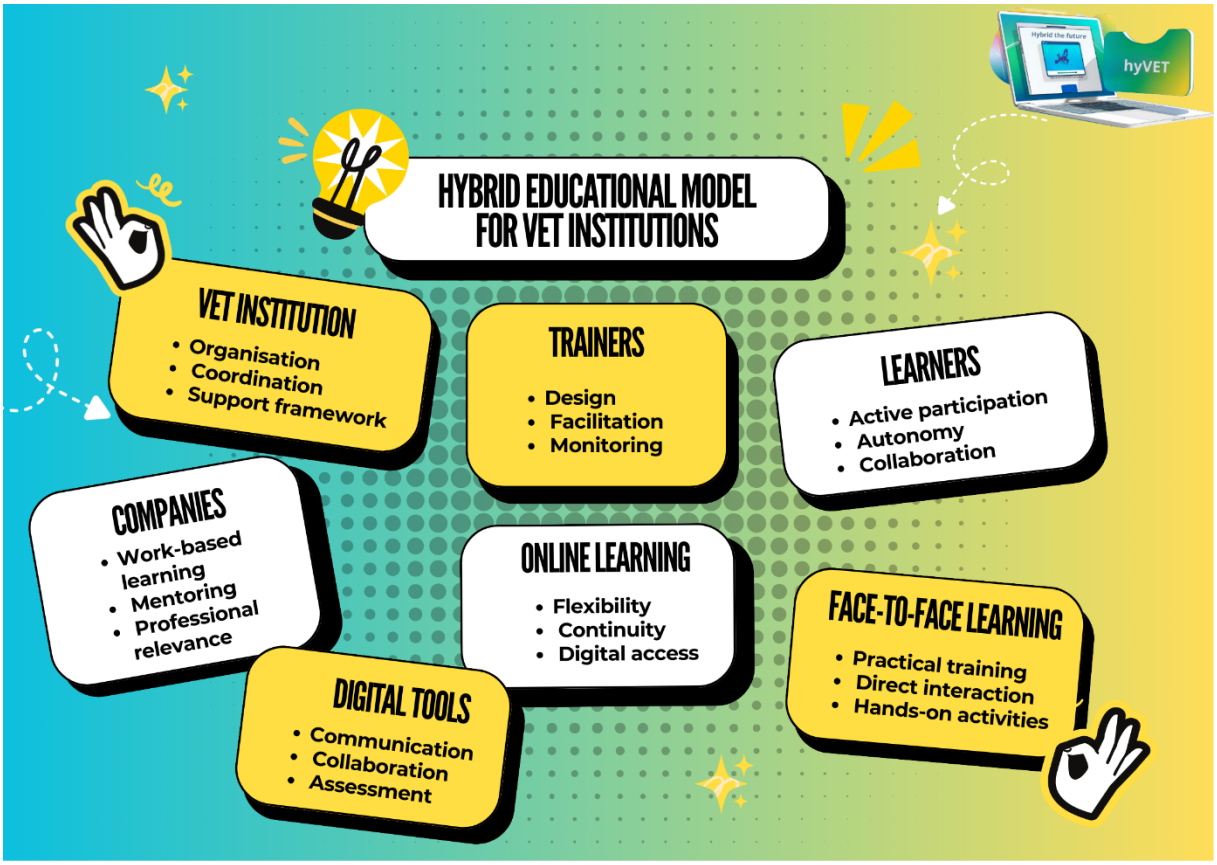

C. The role of trainers and learners in hybrid VET education

Hybrid education in VET is learner-centred and interaction-driven, but it also relies on a strong and flexible involvement of trainers, whose role evolves according to the learning situations, the modalities used and the level of autonomy of the learners.

In hybrid VET settings, trainers no longer intervene in a single, uniform way. Instead, they adapt their pedagogical posture to learners' needs, prior knowledge and pace of progression. This flexibility allows trainers to respond more effectively to heterogeneous groups, which are common in vocational education and training.

According to Réseau Canopé (2023), hybrid learning requires a strong "pedagogical presence", whether physical or remote, which ensures coherence between face-to-face and online learning activities. Trainers are therefore central actors in structuring learning pathways and maintaining meaningful interaction throughout the training process.

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A key characteristic of hybrid education is the intentional distribution of learning activities between guided and autonomous phases.

Some parts of the course are deliberately structured and facilitated by trainers, either in face-to-face sessions or during synchronous online activities. These moments are used to introduce concepts, demonstrate professional practices, support practical exercises and encourage collective discussion.

Other parts of the course are designed to foster **learner autonomy**, through asynchronous online activities such as self-paced modules, individual or group assignments, and collaborative work using digital platforms. These autonomous phases create space for reflection, peer exchange and adaptation to individual learning rhythms, while still being supported by trainers' guidance and feedback.

In this context, trainers are expected to design learning activities suitable for both online and face-to-face delivery, using active learning approaches that engage all learners, regardless of their mode of participation. They facilitate interaction between online and in-person learners, encourage collaboration, and ensure that learning objectives remain consistent across modalities (US Department of Education, ERIC, 2020).

At a distance, trainers act as tutors and coaches, maintaining a continuous pedagogical presence. They monitor learners' progress, respond to questions, provide regular feedback and adjust learning activities when necessary. This role is essential to prevent isolation and support motivation, especially during autonomous learning phases (ERIC, 2020).

Digital tools also allow trainers to observe learning behaviours and adapt their interventions. As highlighted by Lefebvre Dalloz (2023), hybrid education enables more precise monitoring and continuous adaptation of learning pathways, reinforcing personalised support.

Learners, for their part, are recognised as active participants in the learning process. They are expected to engage in learning activities, collaborate with peers using digital tools, and progressively develop autonomy and responsibility for their own learning. Hybrid education thus encourages learners to take ownership of their learning while benefiting from structured support and interaction with trainers.

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Overall, the flexibility inherent in hybrid education allows trainers and learners to continuously adapt to one another. This dynamic interaction strengthens learning quality, supports skills development and responds effectively to the diverse needs of VET learners, while maintaining strong links with professional practice.

Table: Main actors in the hybrid educational model

Actor	**Main role in hybrid VET education**
VET institution	Organises the pedagogical, technical and organisational framework
Trainers	Design, facilitate and monitor hybrid learning activities
Learners	Participate actively and progressively develop autonomy
Companies	Support workplace learning and strengthen professional relevance

D. Added value of hybrid education for VET institutions

Hybrid education offers several advantages for VET institutions, including greater flexibility in organising training programmes, improved accessibility for learners with geographical or time constraints, better alignment between training centres and companies, enhanced learning continuity, and support for individual learning paths based on prior knowledge, pace and motivation.

Hybrid education recognises learners as active participants and promotes inclusion, cooperation and interaction among all stakeholders through the use of ICT solutions.

E. Summary definition for the hyVET project

In the hyVET project, hybrid education for VET institutions is defined as a pedagogical model that combines face-to-face and online learning in a structured and interactive way, enabling trainers to teach and support learners across both modalities, while fostering active learning, inclusion and cooperation with companies to support the development of vocational knowledge and skills.

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3 Key stakeholders and roles

3.1 The role of companies' in VET hybrid education

In Vocational Education and Training (VET), companies are **essential partners**. Hybrid VET combines online learning, face-to-face sessions, and work-based learning in companies, which makes employer involvement crucial (European Commission, 2020). Their participation ensures that training responds to real professional needs and helps learners acquire both technical and transversal skills, such as autonomy, teamwork, communication, problem-solving, and digital literacy (OECD, 2021).

In European VET policy, cooperation with employers and the development of work-based learning are considered central to ensuring that vocational education remains relevant, flexible and responsive to labour market needs. The 2020 Council Recommendation on VET explicitly highlights the importance of stronger partnerships between VET providers and employers, as well as the need to expand work-based learning opportunities. OECD evidence also shows that, in most countries, VET institutions share responsibility for delivering training with companies, meaning that workplace learning is not peripheral but an essential component of many VET systems.

A. Companies as Providers of Work-Based Learning

Companies offer **practical training environments** where learners can apply theoretical knowledge. In hybrid VET, learners can:

- Use the same tools, software, or equipment as in professional practice (UNESCO-UNEVOC, 2021)
- Participate in apprenticeships, internships, or short practical sessions at the company
- Receive guidance from company mentors who support skill development in real tasks

These experiences help learners develop competencies that cannot be fully acquired online.

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B. Companies as Co-Designers of Hybrid Training

Companies contribute to **planning and shaping hybrid learning** by sharing their expectations and identifying skills gaps (European Commission, 2020). This collaboration allows VET providers to:

- Align learning objectives and assessments with industry needs
- Create modules and exercises that combine online, in-class, and workplace activities
- Adjust training approaches depending on whether tasks require digital tools or specialised equipment

This ensures hybrid VET remains **relevant, practical, and adaptable**.

Beyond curriculum design, companies can also help VET institutions identify emerging sectoral trends, including the growing use of digital tools, automation, platform-based work and new technical standards. Their contribution is therefore particularly valuable in hybrid VET, where programmes must remain aligned not only with occupational tasks, but also with changing digital practices in the workplace. This helps institutions decide which learning activities can be supported online, which require direct supervision, and which must remain anchored in real work environments.

C. Organising Hybrid Learning in Companies

The format of hybrid learning in companies varies by profession:

- **Computer-based roles** (e.g., programming, graphic design, accounting) can use online tools for most of the training, combined with supervised practical exercises.
- **Equipment-based roles** (e.g., carpentry, mechanics, hairdressing) require on-site practical work, with online modules used for preparation, reflection, or complementary learning.

In both cases, learners must have **adequate digital and physical resources**, and trainers or mentors should maintain **continuous guidance**, through in-person support or online communication tools such as Zoom or Microsoft Teams (UNESCO-UNEVOC, 2021).

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D. Companies as contributors to assessment and feedback

In hybrid VET, companies also play an important role in monitoring learner progress and contributing to assessment. Workplace mentors are often in the best position to observe how learners perform in real or simulated professional situations, including their technical skills, communication, teamwork, autonomy and problem-solving abilities. OECD work on work-based learning stresses that the quality of workplace learning depends on careful design, support and structured cooperation between training providers and employers. In hybrid settings, this cooperation can be reinforced through shared assessment grids, digital progress logs, online feedback forms and regular check-ins between trainers and workplace mentors. These tools help ensure continuity between school-based, online and workplace learning, while keeping assessment connected to real professional practice.

E. Key Takeaways for VET Practitioners

- Companies are **active partners**, not just hosts for training.
- Collaboration ensures training meets **labour market and digital needs**.
- Hybrid VET combines **structured guidance and autonomous learning**, allowing learners to adapt, practice, and collaborate effectively.
- Clear planning and continuous communication between trainers, learners, and company mentors are essential for quality learning outcomes (OECD, 2021).

By integrating company needs and professional realities into hybrid learning, VET institutions can **better prepare learners for the workplace**, while fostering **skills development and innovation**.

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3.2 The competency profile of the VET hybrid educator

The shift toward hybrid education in Vocational Education and Training (VET) requires educators to develop a specific set of competencies that go beyond traditional teaching skills. A VET hybrid educator must be able to operate effectively across **physical learning environments**, **digital platforms**, and **work-based contexts**. This role combines pedagogical expertise, technological fluency, and strong coordination abilities.
Hybrid VET education blends online learning, face-to-face instruction, and workplace-based training. Therefore, the educator becomes a **learning designer**, a **facilitator**, a **digital mediator**, and a **bridge between schools and companies**. The competency profile reflects this multidimensional role.

International and European evidence confirms that the digital and pedagogical transformation of VET requires new competences for teachers and trainers. UNESCO-UNEVOC notes that many TVET teachers and trainers need stronger support to develop the digital skills required to teach effectively in technology-rich or remote learning environments. In parallel, the European Commission's Digital Education Action Plan underlines that high-quality digital education depends not only on infrastructure, but also on educators who are able to design meaningful learning experiences, support learners and use digital tools in inclusive and pedagogically relevant ways

A. Core Competencies of the VET Hybrid Educator

1. Pedagogical and Instructional Design Competencies

A hybrid educator must be able to:

- design learning pathways that combine online, in-person, and workplace activities
- create engaging digital learning materials (videos, quizzes, simulations, etc.)
- adapt teaching strategies to different modalities (synchronous/asynchronous)
- ensure coherence and continuity across learning environments

This requires a shift from "teaching content" to **designing learning experiences**.

2. Digital and Technological Competencies

Hybrid VET educators must be comfortable with:

- Learning Management Systems (LMS)
- videoconferencing tools
- collaborative platforms (Padlet, Teams, Google Workspace, etc.)
- digital assessment tools
- sector-specific technologies used in companies

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They must also be able to troubleshoot basic technical issues and guide learners in using digital tools safely and effectively.

3. Facilitation and Communication Competencies

Hybrid learning requires strong facilitation skills, such as:

- maintaining learner engagement online and in person
- giving clear instructions across different formats
- providing timely feedback
- supporting learners' autonomy and motivation

Communication must be adapted to multiple channels: email, chat, video, face-to-face, and workplace interactions.

4. Coordination and Collaboration Competencies

The hybrid educator often collaborates with:

- companies
- workplace mentors
- digital learning designers
- other teachers and trainers

They must be able to coordinate schedules, expectations, and learning outcomes across institutions and workplaces.

5. Assessment and Monitoring Competencies

Hybrid VET requires:

- monitoring learner progress through digital tools
- assessing practical skills in workplace settings
- using data (analytics, dashboards) to adjust teaching
- providing personalised feedback

The educator must balance **competency-based assessment** with **digital assessment methods**.

6. Adaptability and Continuous Learning

Hybrid education evolves quickly. Educators must:

- adapt to new technologies
- update their pedagogical practices
- respond to diverse learner needs
- remain flexible in planning and delivery

This mindset is essential for long-term success in hybrid VET.

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These competency areas should not be understood as isolated skills, but as interdependent dimensions of professional practice. In hybrid VET, pedagogical design, digital fluency, communication, coordination and assessment are closely linked. An educator may, for example, need to design an online task, explain it clearly across several channels, coordinate its implementation with a company mentor, and then assess the learner's performance using both digital evidence and workplace observation. This integrated profile reflects the growing complexity of the hybrid educator's role in VET systems undergoing digital transformation (UNESCO 2022-2029).

B. Practical Tips to Develop These Competencies

Voici une liste simple, concrète et actionnable pour aider un éducateur à développer ces compétences.

1. Start small with digital tools

- Choose one platform and master it before adding others.
- Experiment with simple activities (quizzes, forums, short videos).

2. Co-design with colleagues or companies

- Work with workplace mentors to align digital and practical learning.
- Share resources and co-create hybrid modules.

3. Observe and analyse learner behaviour

- Use LMS analytics to understand engagement patterns.
- Adjust pacing and content based on real data.

4. Develop a hybrid teaching routine

- Plan weekly rhythms combining online tasks and in-person sessions.
- Use templates for hybrid lesson planning.

5. Train regularly

- Participate in digital pedagogy workshops.
- Follow micro-learning modules on hybrid teaching.

6. Build a digital presence

- Record short instructional videos.
- Use clear, consistent communication channels.

7. Practice reflective teaching

- After each hybrid session, note what worked and what didn't.
- Adjust progressively rather than trying to change everything at once.

8. Strengthen collaboration with companies

- Schedule regular check-ins with workplace mentors.
- Align expectations and assessment criteria.

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These competences are generally developed progressively rather than all at once. UNESCO-UNEVOC's work on TVET teacher training highlights that barriers often include limited awareness of which digital skills are needed, uneven access to training opportunities, and insufficient alignment between teacher training and labour market realities. This is why professional development in hybrid VET should be practical, continuous and closely connected to teaching contexts and sector needs.

C. Conclusion

The competency profile of the VET hybrid educator is multidimensional and dynamic. It combines pedagogical design, digital fluency, facilitation skills, coordination abilities, and a strong capacity for adaptation. Developing these competencies requires continuous practice, collaboration, and reflective learning. With the right support and training, educators can fully embrace the potential of hybrid VET and create meaningful, flexible, and future-oriented learning experiences.

For this reason, institutional support is just as important as individual motivation. If VET educators are expected to deliver high-quality hybrid learning, they need access to training, time for pedagogical design, appropriate digital tools, and opportunities to collaborate with colleagues and workplace actors. Developing a competent hybrid educator profile is therefore both a professional and an organisational priority.

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3.3 Educators' role in VET hybrid learning environment

Introduction: Who is the VET Hybrid Educator?

In a hybrid VET (Vocational Education and Training) environment, the educator is no longer only a classroom instructor. They become a **learning designer**, a **facilitator**, a **guide**, and a **coordinator** across multiple learning spaces.
Their mission is to ensure **continuity**, **coherence**, and **quality** between:

- face-to-face learning,
- online learning,
- and workplace-based training.

The hybrid educator supports learners as they move between these environments, making sure that learning remains meaningful, structured, and connected to real professional practice.

Francophone research shows that hybridisation profoundly transforms the role of the educator, who becomes a learning designer, a mediator, and a guide. Peltier & Séguin (2021) emphasise that pedagogical presence—whether online or face-to-face—remains a central element in the success of hybrid learning environments. Similarly, France Stratégie (2023) highlights that hybridisation requires strengthened pedagogical engineering and solid mastery of digital tools to ensure coherence throughout the learning pathway.(https://journals.openedition.org/dms/6414?utm_source=copilot.com)

This expanded role is consistent with broader European developments in digital education and VET. The Digital Education Action Plan presents educators as key actors in making digital education high-quality, inclusive and effective, while the 2020 Council Recommendation on VET stresses that VET systems must become more flexible, innovative and resilient. In hybrid environments, this means that educators are not only transmitters of knowledge, but also organisers of learning pathways, facilitators of engagement and connectors between school, digital and workplace learning.

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A. Designing the Hybrid Course and Setting Learning Goals

One of the educator's primary responsibilities is to design a **clear and structured hybrid learning pathway**.

- **Identifying essential content**

The educator selects the key knowledge, skills, and competencies that learners must acquire, and organizes them into a logical progression.

- **Defining learning objectives**

Learning goals must be explicit, measurable, and easy for learners to understand. Clear objectives help learners know what is expected and why it matters.

- **Structuring the course in a Learning Management System (LMS)**

The educator organizes modules, activities, resources, and assessments in a digital platform such as Moodle, Google Classroom, or another institutional LMS.

- **Creating and adapting learning materials**

The educator develops or selects videos, documents, quizzes, demonstrations, and practical tasks.

They decide:

- what can be done independently,
- what requires educator support,
- what must be done in person or in the workplace.

In VET, this planning function is particularly important because not all competences can be developed in the same environment. Educators must therefore identify which outcomes can be achieved through online learning, which require face-to-face support, and which must be practised in workshops, laboratories or companies. The challenge is not simply to distribute content, but to create coherence between modalities while preserving the practical and professional relevance of training.

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B. Giving Clear Instructions and Guiding Learners

Clarity is essential in hybrid learning.

The educator must:

- explain tasks using simple, accessible language,
- provide context and purpose for each activity,
- offer demonstrations or examples,
- share a visual timeline or checklist of tasks,
- encourage questions and verify understanding.

Learners should always know **what to do**, **how to do it**, and **why it matters**.

C. Using ICT Tools Effectively

Hybrid learning requires thoughtful use of digital tools—not more tools, but the **right tools**.

The educator selects ICT solutions that support learning, such as:

- video-conferencing platforms,
- virtual whiteboards,
- collaborative tools (Google Workspace, Microsoft 365),
- mobile learning apps,
- video creation tools,
- immersive technologies (VR/AR) when appropriate.

The choice depends on:

- learner needs,
- pedagogical goals,
- available resources,
- and ease of use.

D. Maintaining Learner Motivation and Engagement

Motivation can be more challenging in hybrid settings, especially online.

The educator plays a key role in sustaining engagement by:

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- using interactive and hands-on activities,
- varying learning formats,
- giving regular and constructive feedback,
- celebrating learner achievements,
- fostering collaboration through group work and discussions,
- maintaining a visible and supportive online presence.

Engagement grows when learners feel **active**, **supported**, and **connected**.

This dimension is especially important in hybrid settings because flexibility can be both a strength and a risk. While hybrid formats may offer greater autonomy and accessibility, they can also lead to disengagement if learners feel disconnected or unsupported. Maintaining motivation therefore requires sustained pedagogical presence, regular feedback and well-structured interaction across modalities.

E. Promoting Inclusion and Accessibility

Hybrid learning must be accessible to all learners.

The educator ensures inclusion by:

- offering multiple formats (text, audio, video),
- providing accommodations when needed,
- using inclusive and respectful language,
- ensuring digital materials are accessible (captions, alt text, readable layouts),
- offering individual support when necessary.

The goal is to create a learning environment where every learner can participate and succeed.

Inclusion in hybrid VET is not limited to disability accommodation. It also concerns learners who face geographical barriers, economic constraints, limited access to devices or connectivity, or difficulties in adapting to autonomous digital learning. For this reason, hybrid educators play an important role in identifying barriers early and adapting learning formats, communication and support strategies accordingly.

F. Designing Clear and Diverse Assessment Methods

Assessment in hybrid VET must be transparent and aligned with learning goals.

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The educator uses a balanced mix of:

- **Diagnostic assessment**

To identify prior knowledge and starting points.

- **Formative assessment**

To provide feedback during the learning process.

- **Summative assessment**

To evaluate final achievement.

Assessment tools may include:

- quizzes,
- observations,
- portfolios,
- interviews,
- practical tasks,
- peer reviews,
- project submissions.

G. Collaborating with Colleagues and Partners

Hybrid VET requires teamwork.

The educator collaborates with:

- other teachers and trainers,
- workplace mentors,
- digital learning specialists,
- support staff.

Collaboration helps:

- share good practices,
- solve technical or pedagogical challenges,
- ensure coherence between school and workplace learning,
- improve the overall quality of the hybrid program.

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This coordination function is particularly valuable in hybrid VET because learning is distributed across several spaces and actors. Without communication between educators, workplace mentors and support staff, learners may experience fragmentation between online tasks, school-based learning and workplace expectations. Effective coordination helps maintain continuity and reinforces the professional relevance of the learning pathway.

H. Ensuring Ethical and Responsible Digital Practices

Ethics are essential in hybrid education.

The educator must:

- protect learner data and privacy,
- promote respectful online behaviour,
- teach digital citizenship and netiquette,
- ensure academic integrity,
- set clear rules for online participation.

Ethical practices create a safe and trustworthy learning environment.

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I. Conclusion: A Multifaceted but Coherent Role

The role of the VET hybrid educator can be summarized in five key actions:

- 👉 **Design** meaningful hybrid learning experiences
- 👉 **Guide** learners across digital and physical spaces
- 👉 **Motivate** and support engagement
- 👉 **Assess** learning in diverse ways
- 👉 **Coordinate** with colleagues and workplace partners

Ultimately, the hybrid educator ensures that learning remains **connected**, **inclusive**, and **professionally relevant**, preparing learners for real-world vocational contexts.

In this sense, the educator becomes the central link ensuring that hybrid VET remains pedagogically coherent, socially inclusive and professionally relevant. The quality of hybrid learning therefore depends not only on technologies or institutional models, but also on the educator's capacity to connect learners, tools, tasks and workplaces into one meaningful learning experience.

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4 Designing The Hybrid Learning Process

4.1 Identifying training needs

A. Why identifying training needs is essential

In hybrid VET education, identifying training needs is not limited to subject-matter knowledge. It also involves understanding learners' digital skills, learning conditions, professional expectations, and their ability to navigate both online and in-person environments. A precise needs analysis ensures that the hybrid learning process is inclusive, coherent, and aligned with real workplace demands.

1. Understanding Learners' Profiles and Learning Conditions

Hybrid VET learners often present diverse backgrounds, motivations, and levels of autonomy. Identifying their needs requires examining several dimensions:

1.1. Prior knowledge and competencies

- Technical and vocational knowledge relevant to the field.
- Digital literacy (LMS navigation, video-conferencing tools, collaborative platforms).
- Learning habits: autonomy, initiative, time management.

1.2. Material and environmental conditions

- Access to stable internet and appropriate devices.
- Availability of a quiet space for online learning.
- Ability to participate in synchronous sessions.

1.3. Social and emotional needs

Hybrid learning relies heavily on cooperation and communication. It is important to identify:

- learners who may feel isolated online,
- those who need frequent feedback,
- those who thrive with more independence.

TIP

Use a short diagnostic survey at the beginning of the course to map learners' digital skills, equipment, and expectations. This prevents avoidable obstacles during hybrid sessions.

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2. Identifying Needs Linked to the Professional Context

Hybrid VET education must remain closely aligned with workplace realities. Training needs should therefore reflect:

2.1. Skills required by companies

- Ability to work remotely (a common post-pandemic practice).
- Professional digital communication.
- Collaborative project management using online tools.

2.2. Transversal competencies

- Problem-solving and critical thinking.
- Adaptability and initiative.
- Teamwork in mixed (online + in-person) groups.

2.3. Sustainability awareness

As highlighted in the document, VET learners must develop:

- an understanding of environmental issues,
- sustainable behaviours in the workplace,
- the ability to integrate sustainability into professional decisions.

TIP

During needs analysis, ask partner companies which digital or collaborative skills are most lacking among interns. Their answers will guide your hybrid course design.

3. Identifying Pedagogical and Organisational Needs

Hybrid learning introduces specific organisational challenges that must be anticipated.

3.1. Managing two audiences simultaneously

Learners online and in person require:

- clear communication channels,
- structured interaction rules,
- balanced attention from the educator.

3.2. Learning space and equipment

The physical and digital environments must support hybrid learning:

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- room layout adapted for visibility and sound quality,
- reliable technological equipment,
- resources accessible through the LMS.

3.3. Active learning readiness

Learners need preparation to engage in:

- small-group discussions (online and in person),
- problem-based or project-based learning,
- debates, peer-teaching, and collaborative tasks.

TIP

Before launching an active learning activity, explicitly explain how each group (online and in-person) will participate. Clear rules prevent confusion and disengagement.

4. Identifying Support and Feedback Needs

Hybrid learning requires differentiated support strategies.

4.1. Feedback expectations

Some learners need continuous guidance, while others prefer autonomy. Online learners may require:

- individual messages through the platform chat,
- short video explanations,
- structured checkpoints.

4.2. Technical support

Technical issues are common in hybrid settings. Learners may need:

- quick access to IT support,
- simple troubleshooting procedures,
- tutorials for essential tools.

TIP

Create short 2–3-minute micro-videos answering recurring questions. This reduces interruptions during hybrid sessions and supports learner autonomy.

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B. Conclusion

Identifying training needs in hybrid VET education means analysing:

- learner profiles and conditions,
- workplace expectations,
- pedagogical and organisational constraints,
- and the level of support required for both online and in-person participation.

A thorough needs analysis ensures that the hybrid learning process is inclusive, flexible, and aligned with the realities of vocational training.

4.2 Creating a hybrid VET course and setting learning objectives

The VET hybrid education course provides a framework to educators prepare their work when some learners engage in in-class, face-to-face (F2F) education while other learners undergo out-of-class, online education.

A. The features of the VET hybrid educational course

The H.E.A.R.T. Model for Hybrid VET Course Design *(Harmonise, Engage, Activate, Reflect, Transfer)*

The **H.E.A.R.T.** Model is a five-phase framework designed specifically for hybrid VET learning environments, where learners alternate between face-to-face and online modalities, and where professional relevance and inclusion are central.

This model is intended as a flexible design framework rather than a strictly linear sequence. Its five dimensions can be combined and revisited throughout the course design process, depending on the needs of learners, educators and professional contexts.

Each phase addresses a key dimension of hybrid VET pedagogy.

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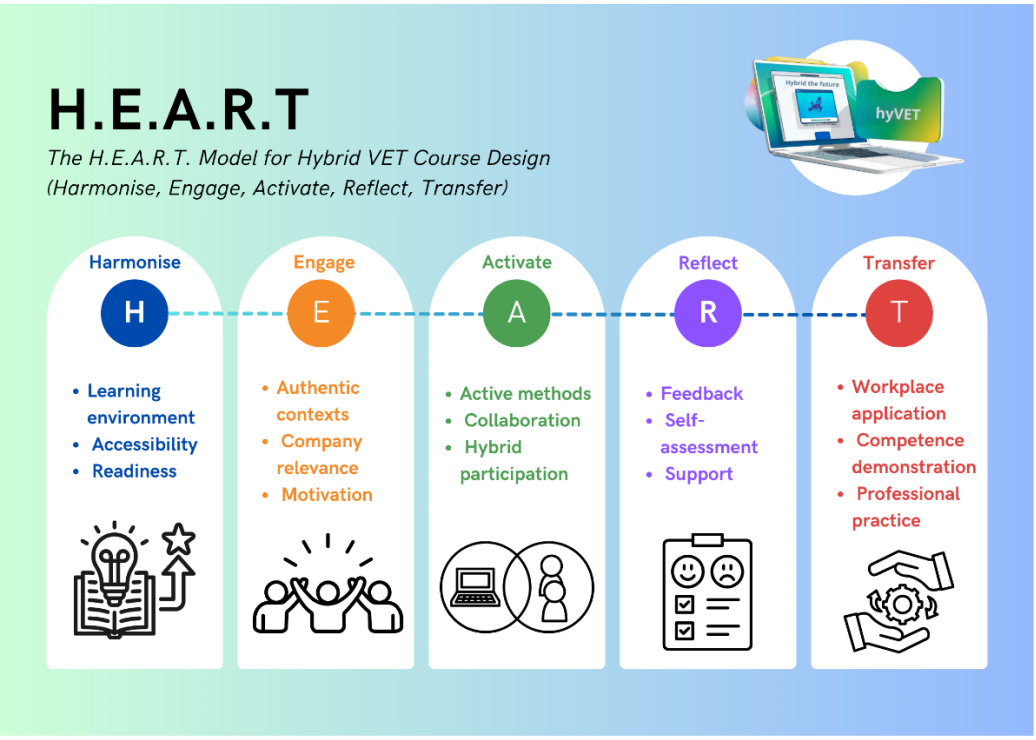

H — Harmonise the Learning Environment

Purpose*: Create the conditions for hybrid learning to work*

This phase focuses on:

- mapping learners' needs (digital, material, motivational),
- ensuring accessibility (LMS, equipment, space),
- establishing communication channels for both groups,
- clarifying expectations and learning pathways.

Why it matters: Hybrid VET collapses if the environment is not stable, inclusive, and predictable.

Examples of actions:

- Diagnostic survey
- LMS onboarding
- Hybrid classroom setup
- Clear participation rules for online + in-person learners

TIP: Start every course with a "Hybrid Readiness Check" to ensure no learner is left behind.

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E — Engage Through Authentic Contexts

Purpose*: Anchor learning in real vocational situations*

This phase ensures that learning objectives and activities are:

- relevant to workplace realities,
- connected to company needs,
- meaningful for learners' future professional identity.

Why it matters: Motivation in VET is driven by *purpose* and *professional relevance*.

Examples of actions:

- Introduce a real case from a partner company
- Use a problem scenario that both online and in-person learners can explore
- Invite learners to share their own workplace experiences

TIP: Start each module with a short "professional challenge" that frames the learning.

A — Activate Learning Through Hybrid Methods

Purpose*: Use active learning strategies adapted to hybrid settings*

This phase focuses on:

- collaborative tasks (online + F2F),
- problem-based learning,
- small-group discussions,
- peer-teaching,
- practical tasks with digital integration.

Why it matters: Hybrid VET must avoid passive online learners and disengaged in-person learners.

Examples of actions:

- Think-Pair-Share with mixed groups
- Project-based learning with shared digital workspaces
- Practical tasks streamed for online learners

TIP: Alternate between synchronous and asynchronous activities to maintain rhythm and autonomy.

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R — Reflect and Receive Feedback

Purpose*: Support learning through structured reflection and feedback*

This phase ensures:

- regular feedback loops,
- self-assessment and peer-assessment,
- opportunities to correct misconceptions,
- emotional and motivational support.

Why it matters: Hybrid learners often feel "invisible" - feedback reconnects them to the learning community.

Examples of actions:

- Weekly reflection journal (voice, text, or video)
- Micro-feedback via chat or LMS
- Peer review sessions

TIP: Use 2–3 minute micro-videos to answer recurring questions — efficient and personal.

T — Transfer to Professional Practice

Purpose*: Ensure that learning is applied, demonstrated, and mobilised*

This phase focuses on:

- applying skills to real workplace tasks,
- integrating sustainability and professional ethics,
- preparing for internships or work-based learning,
- demonstrating competencies through authentic assessments.

Why it matters: VET learning is successful only when it transforms workplace performance.

Examples of actions:

- Workplace simulations
- Digital portfolios
- Company-based projects
- Competency demonstrations

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TIP: Ask learners to document how they apply course concepts in their workplace or internship.

Why the H.E.A.R.T. Model works

Model is:

- **simple** - five phases that are easy to remember,
- **flexible -** not strictly sequential and can be combined,
- **deeply VET-oriented** - grounded in authenticity, transfer and workplace relevance,
- **hybrid-ready** - each phase integrates online and face-to-face dimensions,
- **inclusive -** attentive to learner needs, feedback and accessibility,
- **aligned with active learning** - promoting participation, reflection and application.

4.3 Integrating ICT tools to enhance VET hybrid learning

A. Start-up

In hybrid VET education, educators must possess solid knowledge of Internet-based tools, digital applications, and electronic resources that support the achievement of educational goals. ICT tools enhance communication between in-person and online learners, facilitate interaction with the educator, and enable the design of engaging, flexible, and inclusive learning experiences.

A wide range of applications—both free and paid—are available on the market. Selecting appropriate tools requires understanding their pedagogical value, ease of use, and relevance to hybrid learning. This section presents the principles of ICT integration as well as a selection of tools that can support educators in delivering effective hybrid lessons.

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B. Definition and Scope of ICT in Education

Information and Communication Technologies (ICT) refer to the digital tools, systems, and infrastructures used to support teaching, learning, communication, and assessment. In hybrid VET settings, ICT includes:

- learning management systems (LMS),
- video conferencing platforms,
- collaborative workspaces,
- interactive applications,
- simulation and multimedia tools,
- mobile learning environments,
- classroom technologies that connect online and in-person learners.

ICT is a foundational component of hybrid education. Its strategic use ensures continuity between modalities, supports learner engagement, and prepares learners for digital professional environments.

C. The Role of ICT in Hybrid VET Learning

ICT tools serve multiple pedagogical and operational functions:

- facilitating access to learning resources for all learners,
- supporting synchronous and asynchronous communication,
- enabling collaborative work across physical and virtual spaces,
- providing mechanisms for feedback and assessment,
- promoting inclusion by accommodating diverse needs and learning rhythms,
- strengthening learners' digital and professional competencies.

Effective ICT integration enhances the quality, flexibility, and relevance of hybrid VET programmes.

D. Strategic Dimensions of ICT Integration

1. Infrastructure and Accessibility

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Purpose: Ensure that all learners can effectively participate in hybrid learning.

This dimension includes:

- reliable internet connection and appropriate devices,
- access to a functional LMS,
- basic digital literacy for both learners and educators,
- technical support mechanisms.

Tip: Conduct a digital readiness survey at the beginning of the course to identify potential barriers and provide targeted support.

2. Communication and Collaboration

Purpose: Support clear, inclusive and structured interaction across modalities.

Effective practices include:

- using chat functions for real-time interaction,
- creating forums for asynchronous dialogue,
- sharing collaborative documents,
- using visual boards for brainstorming and project planning.

Tip: Establish a communication charter defining expectations and etiquette for hybrid interactions.

3. Learning Activities and Engagement

Purpose: ICT tools support active learning strategies adapted to hybrid contexts, such as:

- flipped learning with video capsules,
- interactive quizzes and gamified assessments,
- project-based learning with shared digital environments,
- peer teaching and feedback.

Tip: Use short video capsules (2–3 minutes) to introduce tasks or clarify complex concepts.

4. Assessment and Feedback

Purpose: Digital tools offer flexible and continuous assessment opportunities:

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- online rubrics and feedback forms,
- digital portfolios,
- self-assessment and peer-assessment activities,
- audio or video feedback from educators.

Tip: Use screen recordings or voice notes to provide personalised feedback.

E. Examples of ICT Tools for Hybrid VET Education

The table below presents a selection of ICT tools that can support hybrid VET education. The choice of tools should always depend on pedagogical objectives, accessibility, ease of use and the specific needs of learners and educators.

In hybrid VET, the value of ICT tools does not lie in the number of tools used, but in their pedagogical coherence. A small and well-chosen set of tools can be more effective than a fragmented digital environment. Educators should therefore prioritise tools that are accessible, reliable, easy to learn, and clearly aligned with learning objectives and workplace relevance.

Tool	Main use in hybrid VET	Examples of pedagogical use	Website
Moodle	Learning management system (LMS)	Course organisation, resource sharing, assignments, discussions, learner tracking	www.moodle.com
Google Docs	Collaborative writing and group work	Co-writing, peer feedback, shared notes, collaborative projects	www.docs.google.com
Microsoft Teams	Communication and online class management	Live sessions, file sharing, chat, teamwork, hybrid coordination	www.microsoft-teams

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Tool	Main use in hybrid VET	Examples of pedagogical use	Website
Kahoot!	Interactive quizzes and formative assessment	Icebreakers, revision, gamified assessment, live engagement	www.kahoot.com
Canva	Visual content creation and collaborative design	Presentations, posters, infographics, learner projects	www.canva.com
Genially	Interactive presentations and multimedia resources	Interactive lessons, quizzes, visual scenarios, digital storytelling	www.genial.ly
AnswerGarden	Quick brainstorming and instant feedback	Word clouds, diagnostics, collecting initial ideas, classroom interaction	www.answergarden.ch
Any.do	Task and time management	Organising assignments, deadlines, project planning, learner autonomy	www.any.do

Chat functions, available in many hybrid learning platforms, can be used to ask questions, collect short answers, share links and materials, communicate with online learners and support subgroup discussions. They are particularly useful for maintaining the active participation of remote learners during hybrid sessions.

Sum-up

ICT tools are essential in hybrid VET education. They support inclusion, learner autonomy and flexible learning pathways, while enhancing communication, collaboration and engagement across both online and face-to-face modalities. Their effectiveness, however, depends on thoughtful and pedagogically relevant integration.

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Tips

- Many ICT tools offer free basic versions; test them before purchasing extended features.
- Select tools based on pedagogical relevance rather than novelty.
- Avoid using too many tools in a single lesson, as this may overwhelm learners.
- Ensure that each tool contributes directly to learning objectives and supports both online and face-to-face learners.

5. Infastructure and Conclusions

5.1 Facilities and equipment for VET hybrid education

Hybrid education requires a learning environment capable of supporting simultaneous participation of in-person and online learners. Research and institutional guidelines highlight that the quality of the physical and digital infrastructure is a determining factor for learner engagement, communication, and pedagogical effectiveness. In hybrid VET, infrastructure should not be understood as a purely technical issue, but as a condition for inclusion, continuity and active participation across learning modalities. European digital education policy also stresses that high-quality and inclusive digital education depends on adequate infrastructure, access, capacity and support.

1. Physical Learning Space

1.1 Flexible Room Layout

Hybrid classrooms should be organised to ensure visibility, audibility and interaction for all learners. The CHARM-EU Hybrid Classroom model emphasises that classroom design should support different learning scenarios, including standard hybrid teaching and hybrid active learning. Flexible furniture and adaptable layouts are especially useful when VET learners need to alternate between explanation, demonstration, collaborative work and discussion.

1.2 Lighting

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Appropriate lighting is essential to ensure that the educator, demonstrations and visual materials remain clearly visible to remote participants. Good lighting improves the quality of video transmission and supports clearer communication, especially during practical or demonstration-based teaching. This is particularly relevant in VET, where visual observation may be important for understanding processes, tools or gestures. This is consistent with CHARM-EU's emphasis on making hybrid classrooms usable across varied learning situations.

1.3 Acoustic Quality

Clear sound is critical in hybrid learning. Poor acoustics, echo or weak audio capture can quickly exclude online learners from classroom interaction. Hybrid classroom guidance from CHARM-EU and other hybrid learning models underlines the importance of sound quality for participation, especially when discussion and group work are involved. In VET, this is particularly important when instructions, demonstrations or safety-related explanations must be clearly heard.

2. Audiovisual Equipment

High-quality audiovisual equipment is central to hybrid learning because it supports presence, interaction and continuity between modalities. In practice, this means ensuring that both the educator and classroom activities can be seen and heard clearly by remote learners, while voices and contributions from remote learners can also be heard in the classroom. CHARM-EU identifies audiovisual setup as one of the core components of a functioning hybrid classroom.

2.1 Camera System

A high-definition camera is needed to capture the educator and, where relevant, practical demonstrations or collaborative activities. In VET settings, additional or mobile cameras may be useful for streaming practical tasks, close-up demonstrations or vocational techniques that require visual precision. Kalyzee recommends HD conference cameras and, when possible, auto-tracking systems to follow the educator's movements.

2.2 Microphones

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Audio quality is often more important than video quality in ensuring meaningful participation. Hybrid classrooms therefore need microphones that can capture the educator clearly and also support classroom discussion. This may involve a lapel or headset microphone for the educator and room microphones for wider participation.

2.3 Speakers

Speakers are needed so that remote learners' voices can be heard by in-person participants. This helps maintain interaction and reduces the risk that online learners become invisible or peripheral to the class.

2.4 Display System

A visible display system, such as a projector, screen or touchscreen, is important for sharing digital content, presenting remote participants and supporting collaborative work. In active hybrid classrooms, this can also help structure group work and make online learners more present in the physical classroom.

3. Digital Infrastructure

3.1 Internet Connectivity

Stable and high-speed internet access is a prerequisite for hybrid learning. The educator's workstation should ideally be connected through a reliable connection, and institutions should anticipate contingency solutions in case of network failure. The Digital Education Action Plan repeatedly links effective digital education to adequate infrastructure and connectivity.

3.2 Learning Management System (LMS)

A centralised LMS supports resource distribution, communication, assessment and asynchronous learning. In a hybrid VET context, it also helps maintain continuity between classroom sessions, online tasks and workplace-related learning. CHARM-EU presents the hybrid classroom as part of a broader virtual learning environment, which reinforces the importance of a clear digital backbone for course delivery.

3.3 Video Conferencing Platform

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A reliable video conferencing platform with screen sharing, chat, breakout rooms and recording options is necessary for synchronous hybrid sessions. Such tools help maintain participation, interaction and flexibility across locations.

4. Devices and Tools for Learners

4.1 Individual Devices

Learners should have access to appropriate devices, such as laptops or tablets, and when needed headphones with microphones. Equal participation in hybrid learning depends not only on institutional equipment, but also on learners' ability to access and use digital tools. This aligns with European guidance on inclusion and digital readiness.

4.2 Equipment for Practical Tasks

In VET contexts, additional tools may be needed to support practical learning, such as mobile cameras for demonstrations, field-specific software, simulation tools or digital equipment related to the vocational specialism. Cedefop highlights the need for up-to-date physical and digital infrastructure in VET so that learners can develop relevant occupational skills.

5. Technical Support and Maintenance

5.1 On-site Technical Support

Hybrid classrooms require rapid access to technical support and clear troubleshooting procedures. CHARM-EU provides practical checklists for starting up hybrid classrooms and underlines the importance of support for teaching staff using these environments.

5.2 Regular Maintenance

Equipment and software should be tested and updated regularly to ensure reliability. Backup solutions are also advisable in case of technical failure. In hybrid learning, technical breakdowns can quickly affect participation and continuity, so prevention is a key part of quality assurance.

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6. Accessibility and Inclusion

Hybrid learning environments should be designed to support equal participation for all learners. This may include captioning or transcription tools, adjustable audio and visual settings, compatibility with assistive technologies, and digital versions of all learning materials. The Digital Education Action Plan explicitly links digital education with inclusion and accessibility, and SELFIE also frames digital school development as an institutional issue rather than only a technical one. Hybrid classrooms should therefore avoid privileging one modality over the other and should enable remote learners to participate meaningfully in interaction, discussion and group work.

Practical tips for Educators:

- Test all equipment before each session to avoid interruptions.
- Prioritise reliability over complexity; simple setups are often more effective.
- Use a pre-session checklist (camera, microphone, internet, LMS, materials).
- Position yourself where both online and in-person learners can see and hear you clearly.
- Avoid switching between too many tools during a single lesson.
- Always have a backup plan in case of technical failure.

Table minimum requirements for a hybrid VET classroom:

The table below summarises the minimum requirements for creating a functional and inclusive hybrid VET classroom. These elements support participation, continuity and pedagogical effectiveness across face-to-face and online learning environments.

Component	Minimum requirements	Why it matters in hybrid VET
Physical learning space	Flexible room layout, clear sightlines, adequate lighting, good acoustics	Supports visibility, audibility and interaction for both face-to-face and online learners

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Component	Minimum requirements	Why it matters in hybrid VET
Audiovisual equipment	HD camera, educator microphone, room microphones, speakers, display screen or projector	Ensures that all participants can see, hear and interact clearly across modalities
Internet and connectivity	Stable high-speed internet, reliable connection for the educator, backup solution if needed	Prevents disruptions and supports continuous participation in synchronous sessions
Digital learning environment	Functional LMS, video conferencing platform, access to digital materials and communication tools	Maintains continuity between classroom, online and asynchronous learning
Learner devices and tools	Laptops or tablets, headphones with microphones when needed, access to field-specific digital tools	Enables active participation, communication and task completion in hybrid settings
Technical support and accessibility	Troubleshooting procedures, regular maintenance, accessible materials, compatibility with assistive tools	Reduces barriers to participation and ensures a more inclusive learning environment

Conclusion

A well-designed hybrid learning environment requires thoughtful planning, appropriate equipment and reliable digital infrastructure. When these conditions are in place, hybrid VET education becomes a more inclusive, flexible and effective model for teaching and learning. Facilities and equipment are therefore not merely technical components, but essential conditions for pedagogical quality, continuity and participation.

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5.2 Summary of findings and final recommendations

A. Summary of Findings

The findings presented throughout this manual show that hybrid VET education depends on the coherent combination of pedagogical, technological and organisational dimensions. First, hybrid VET is most effective when it is grounded in clear pedagogical principles, including active learning, learner-centred approaches and authentic vocational tasks. Second, infrastructure and digital readiness are foundational conditions for meaningful participation across online and face-to-face modalities. Third, educators need specific competences to manage hybrid learning effectively, including digital fluency, pedagogical design, facilitation and differentiated support. Fourth, ICT tools can significantly enhance communication, collaboration and assessment when they are selected and used strategically. Fifth, hybrid VET can support inclusion and flexibility, provided that accessibility and support mechanisms are built into course design. Finally, strong links with companies and professional partners remain essential to ensure that hybrid VET stays relevant to workplace realities and labour market needs.

B. Final recommendations

Based on these findings, several recommendations can be proposed for institutions, educators and stakeholders implementing hybrid VET programmes.

1. **Invest in robust and inclusive infrastructure.**
   Ensure that hybrid classrooms are equipped with reliable audiovisual systems, stable connectivity and accessible digital environments. Technical support and maintenance should be part of routine provision, not an afterthought.

2. **Provide continuous professional development for educators.**
   Training should focus on digital pedagogy, hybrid classroom management, ICT

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integration and inclusive teaching. Educators also need time and support to experiment, reflect and collaborate.

3. **Prioritise pedagogical coherence over technological complexity.** Hybrid learning should be driven by learning objectives, not by the number of digital tools used. Simplicity, consistency and relevance are more effective than tool overload.

4. **Strengthen communication and learner support systems.** Clear communication channels, structured feedback and accessible support mechanisms are essential for learner confidence, continuity and engagement.

5. **Promote active, collaborative and authentic learning.** Hybrid VET should integrate problem-based learning, project work, peer collaboration and vocationally relevant tasks that reflect workplace realities.

6. **Ensure accessibility and inclusion by design.** Materials, tools and activities should be designed to support learners with diverse needs and should reduce rather than reinforce barriers to participation.

7. **Maintain strong cooperation with companies and professional partners**

   Hybrid VET must remain connected to work-based learning, sectoral change and real occupational practices. Collaboration with companies strengthens relevance, employability and transfer to professional contexts.

C. Final conclusion

Hybrid VET education offers strong potential for flexibility, inclusion and innovation. When supported by appropriate infrastructure, thoughtful pedagogical design and well-prepared educators, it can become a powerful model for preparing learners for the evolving demands of contemporary workplaces. The recommendations outlined above are intended to support institutions and practitioners in building sustainable, effective and learner-centred hybrid VET systems.

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