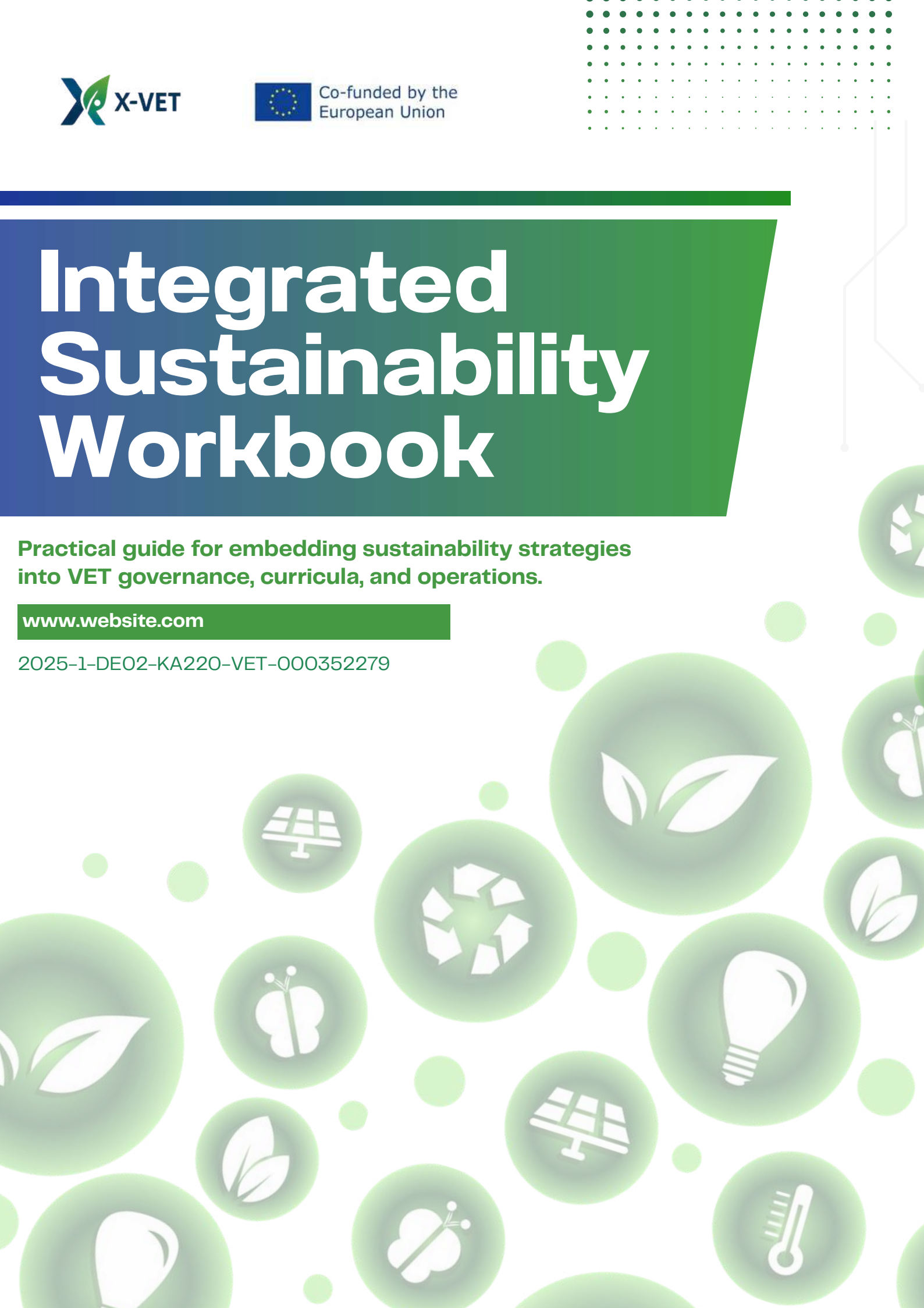


Integrated Sustainability Workbook

**Practical guide for embedding sustainability strategies
into VET governance, curricula, and operations.**

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Integrated Sustainability for the Effective Navigation of Emerging Critical Transformations – X-VET

2025-1-DE02-KA220-VET-000352279

Partners:



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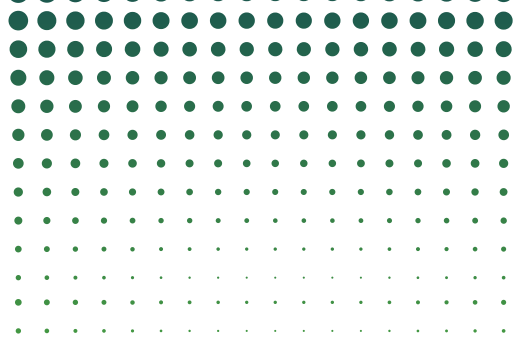
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How to Read this Workbook

This workbook is both a reference and a working tool. It gives VET institutions a shared language for the competences that sustainability requires – and a practical, sequenced route for embedding them across the whole organisation. It is designed to be used selectively as much as read linearly: each Part stands on its own, cross-references connect them, and every element points towards action. This page explains how the four Parts fit together and how different readers can find their fastest route through them.

Part I – Foundation sets the scene: why sustainability and the twin green–digital transition matter for VET, the European policy landscape that drives them – from the European Green Deal and the Digital Decade to the Council Recommendations that address education directly – and the Whole–Organisation Approach on which everything else in the workbook rests. Read it first if you need the ‘why’, or to brief colleagues and governance.



Part II – The X–VET Framework presents the heart of the workbook: ten integrated sustainability competences for the people who lead, teach and coordinate the transition, organised in three groups and woven through by four strategic themes. It also sets out the learning–theory foundations (Section 2.3) that underpin the whole approach.

Reading the competence pages. Each of the ten competences is presented in a consistent structure: a dimension narrative explaining what the competence is and why it matters, followed by an attributes table setting out its skills, knowledge and attitudes at three levels of mastery – Basic, Intermediate and Advanced. The levels form a developmental ladder, from emerging, guided capability, through independent practice, to advanced practice that shapes the institution and influences others. Use them for self–assessment (locate your current level), for professional–development planning (name the next level and the evidence that would demonstrate it), and for team profiles that reveal where collective capability is strong and where it is thin.



Part III – The 10–Step Process Model turns competence into implementation: a sequenced route from readiness assessment to long–term institutionalisation. The steps build on one another – the outputs of each feed the next – but an institution already in motion can enter at the step that matches its situation. Every step is supported by a companion Implementation Guide & Toolkit containing the working instruments: canvases, registers, rubrics and checklists referenced throughout this workbook.

Part IV – Best Practices and Case Studies grounds the model in reality: practices collected by the partner consortium, three presented in depth and ten more in brief, with a link to the full online collection. Use them for inspiration, for benchmarking, and as evidence that the approach works in institutions like your own.



Suggested pathways. Institutional leaders may read Part I, skim the competence overviews, and work Part III with their teams. Educators and trainers may start with Competences 4–6 and Steps 4–7. Coordinators and quality staff will live mainly in Part III and its toolkits, returning to Part II to assess and develop the competences the steps demand. Whoever you are: begin where your institution’s need is sharpest – the cross–references will carry you to the rest.

1. Introduction and Purpose

Vocational education and training (VET) stands at the centre of Europe's twin green and digital transition. VET institutions shape the skills of the workers who will build, run and maintain a sustainable economy, and they are themselves organisations that consume energy, procure materials and model – or fail to model – the practices they teach. Yet sustainability is too often added to a VET institution as an isolated module, a single enthusiastic teacher, or a time-limited project. Treated that way, it remains peripheral, and it fades the moment the funding ends or the champion moves on. Lasting change requires something different: sustainability embedded across the whole organisation, carried by people who hold the right competences, and implemented through a deliberate, sequenced process.

This workbook responds to that need. It provides both a shared language for the competences that sustainability in VET demands, and a practical route to embed them institution-wide. It is organised in four parts. **Part I – Foundation** establishes why sustainability matters in VET, how it aligns with European policy – above all the European Green Deal and Europe's Digital Decade – and introduces the Whole-Organisation Approach that makes institutional change lasting rather than superficial. **Part II – The X-VET Framework** sets out the Competence Model at the heart of the workbook: ten competences, each defined as a combination of skills, knowledge and attitudes, together with the strategic themes of sustainability governance, green skills, digital innovation and work-based sustainability learning. **Part III – The 10-Step Process Model** turns the framework into action, offering a sequenced, tool-supported route through which an institution can plan, deliver, evaluate and sustain its transition. **Part IV – Best Practices and Case Studies** grounds it all in practice: cases collected by the partner consortium – three in depth, ten in brief, and the full collection online.

The workbook is written for three audiences at once. Institutional leaders and managers will find in it a basis for governance, strategy and long-term planning. Teachers and trainers will find a map of the competences they need and the pedagogy that builds them. Sustainability coordinators and quality staff will find a step-by-step implementation process with ready-to-use tools. The four parts are designed to be read in sequence – Part I for grounding, Part II to assess and develop competence, Part III to implement, and Part IV to learn from practice – but each can also be used on its own, and Part III's ten steps are each supported by a dedicated implementation toolkit.

Part I –

Foundation: Sustainability and the Whole-Organisation Approach in VET

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Part I sets the foundations on which the rest of the workbook is built. It explains why vocational education and training is pivotal to the sustainability transition, situates that role within the European policy landscape that drives it, and introduces the Whole-Organisation Approach – the principle that sustainability must be embedded across every part of an institution if it is to endure. Together these establish the ‘why’ that the Framework (Part II) and the Process Model (Part III) then turn into competence and action.

1.1 Sustainability and the twin transition in vocational education

Europe is undergoing two linked transformations at once: a green transition towards a climate-neutral, resource-efficient and circular economy, and a digital transition that is reshaping how work is organised and performed. These are not separate agendas but a single, intertwined ‘twin transition’ – energy systems now run on data, construction is being digitalised through modelling tools, and digital work itself carries an environmental footprint. VET sits at the meeting point of both, because it prepares people for precisely the occupations that the twin transition is changing most.

This gives VET a dual responsibility. Outward-facing, it must equip learners with the green and digital competences that a sustainable economy requires, so that graduates can install low-carbon technologies, work within circular business models, and use digital tools responsibly. Inward-facing, it must transform its own practice – how it governs, teaches, procures and operates – so that the institution embodies the sustainability it teaches. An institution that lectures on energy efficiency while wasting energy in its own workshops teaches a contradiction. Meeting both responsibilities, and treating the green and digital dimensions as one integrated challenge rather than two parallel projects, is the task this workbook supports.

1.2 The European policy landscape

The workbook is anchored in the European policy framework for the twin transition. The overarching reference is the European Green Deal (COM(2019) 640), the European Union’s growth strategy for a climate-neutral continent by 2050, which makes clear that the transition can only succeed if people have the right skills – a point developed by the European Skills Agenda for sustainable competitiveness, social fairness and resilience (COM(2020) 274) and its emphasis on a just transition in which no one is left behind.

The digital half of the transition is framed by Europe's Digital Decade – the policy programme (Decision (EU) 2022/2481) that sets targets for digital skills, infrastructure and the digital transformation of public services by 2030 – and, for education specifically, by the Digital Education Action Plan 2021–2027 (COM(2020) 624). Read together with the Green Deal, these instruments define the twin transition as a combined green and digital agenda, which is why this workbook integrates green and digital competences throughout rather than addressing them in isolation.

These strategic frameworks are backed by binding law and by an economic programme. The European Climate Law (Regulation (EU) 2021/1119) makes climate neutrality by 2050 – with an intermediate reduction of at least 55% by 2030 – a legal obligation, giving the transition both force and a timetable. The Circular Economy Action Plan (COM(2020) 98) sets out its economic shape: product design for durability and repair, new circular business models, and priority value chains – construction, electronics, textiles, packaging – that map directly onto the occupations VET trains for. Together they define not only why the transition matters but where its jobs and skills will be.

For vocational education in particular, three instruments give this direction concrete form. The Council Recommendation of 24 November 2020 on vocational education and training (2020/C 417/01) positions VET as an enabler of the twin transition and embeds a European quality-assurance framework; the Osnabrück Declaration (2020) commits European VET systems to working with employers and social partners on the just transition to green and digital economies; and the Council Recommendation of 16 June 2022 on learning for the green transition and sustainable development (2022/C 243/01) asks education and training providers to embed sustainability not only in teaching but in governance, operations and partnerships – the whole-institution approach that Part I develops below. The competences themselves draw on the European reference frameworks: GreenComp, the European sustainability competence framework (Bianchi, Pisiotis and Cabrera Giraldez, 2022), and DigComp, its digital counterpart.

A final layer of instruments addresses skills and their recognition. The Council Recommendation of 22 May 2018 on key competences for lifelong learning (2018/C 189/01) already names the competences citizens need for sustainable societies; the twin Council Recommendations of 16 June 2022 on micro-credentials (2022/C 243/02) and on individual learning accounts (2022/C 243/03) create European approaches for certifying and financing the short, targeted learning that upskilling for the transition requires; and the Pact for Skills, launched under the Skills Agenda, mobilises large-scale public-private commitments to reskilling in the very ecosystems the Green Deal transforms. For VET institutions these are practical levers: they shape what to teach, how to certify it, and with whom to partner.

1.3 The Whole-Organisation Approach (WOA)

The central conviction of this workbook is that sustainability in VET cannot be delivered by the curriculum alone. It is not a subject to be added to a timetable but a transformation to be embedded across the whole organisation. This is the Whole-Organisation Approach (WOA) – in European policy terms, the ‘whole-institution approach’ called for by the Council Recommendation of 16 June 2022 and, internationally, the whole-institution model at the heart of UNESCO’s Education for Sustainable Development roadmap (ESD for 2030). Its rationale is simple: change that lives in one module, one project or one person is fragile, and reliably fades; change embedded in how an institution governs, teaches, operates and partners becomes permanent.

In practice, the WOA means that every domain of the institution pulls in the same direction. Governance and strategy set sustainability as an institutional priority with leadership, resources and accountability behind it. Curriculum, teaching and learning build sustainability competences across programmes, not in a single bolt-on unit. Campus, operations and resources – energy, waste, procurement, the buildings and workshops themselves – are managed sustainably and used as a ‘living lab’ that makes sustainability visible to learners. Staff capability and culture are developed so that commitment extends well beyond a few champions. Learners are engaged as active partners and co-creators. And partnerships with employers, authorities and the community connect the institution to the world of work and the place it serves. The decisive test is coherence: learners should experience consistency between what they are taught and how the institution actually behaves.



Figure 1 – The Whole-Organisation Approach: six institutional domains pulling in one direction.

The Whole-Organisation Approach is the thread that ties the two halves of this workbook together. The X-VET Framework in Part II names the competences that a whole organisation needs in order to lead, deliver and sustain this transformation; the 10-Step Process Model in Part III is the route through which a whole organisation builds those competences and embeds the change, domain by domain, until sustainability is simply part of how the institution works.

Part II –

The X-VET Framework: A Competence Model for Sustainability in VET

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Part II presents the Framework at the heart of the workbook: a Competence Model that defines the essential skills, knowledge and attitudes required to lead and deliver sustainability in a VET institution. It first explains what is meant by integrated sustainability competences, then sets out the architecture of the ten-competence model and the strategic themes it weaves together, explains how to read and use the framework, and outlines how the competences are developed. The ten competences themselves, each with its dimension and its attributes across three levels of mastery, then follow.

2.1 What we mean by integrated sustainability competences

Following GreenComp, this framework treats a competence not as knowledge alone but as the ability to mobilise knowledge, skills and attitudes together in order to act. Knowing about the circular economy is not the same as being able to redesign a programme around it, or being disposed to question a wasteful practice; a genuine competence unites all three. Each competence in this framework is therefore described through its skills (what a person can do), its knowledge (what they understand) and its attitudes (the values and dispositions that shape how they act).

The competences are ‘integrated’ in two senses. They integrate the green, digital and economic dimensions of the transition, reflecting the twin transition and the reality that sustainability in modern occupations is simultaneously environmental, technological and economic. And they are integrated into the whole organisation, in keeping with Part I — they are competences for governing, teaching, collaborating and operating sustainably, not only for classroom delivery. Importantly, this framework addresses the educators, leaders and coordinators who drive the institutional transition, complementing learner-facing frameworks such as GreenComp: it describes what the people who lead sustainability in VET need to be able to do.

To make this concrete, the blocks below show how a single competence — Evaluating and Reviewing for Improvement (Competence 3) — resolves into its attributes and progresses across the three levels of mastery. Every competence in this Part follows the same anatomy.

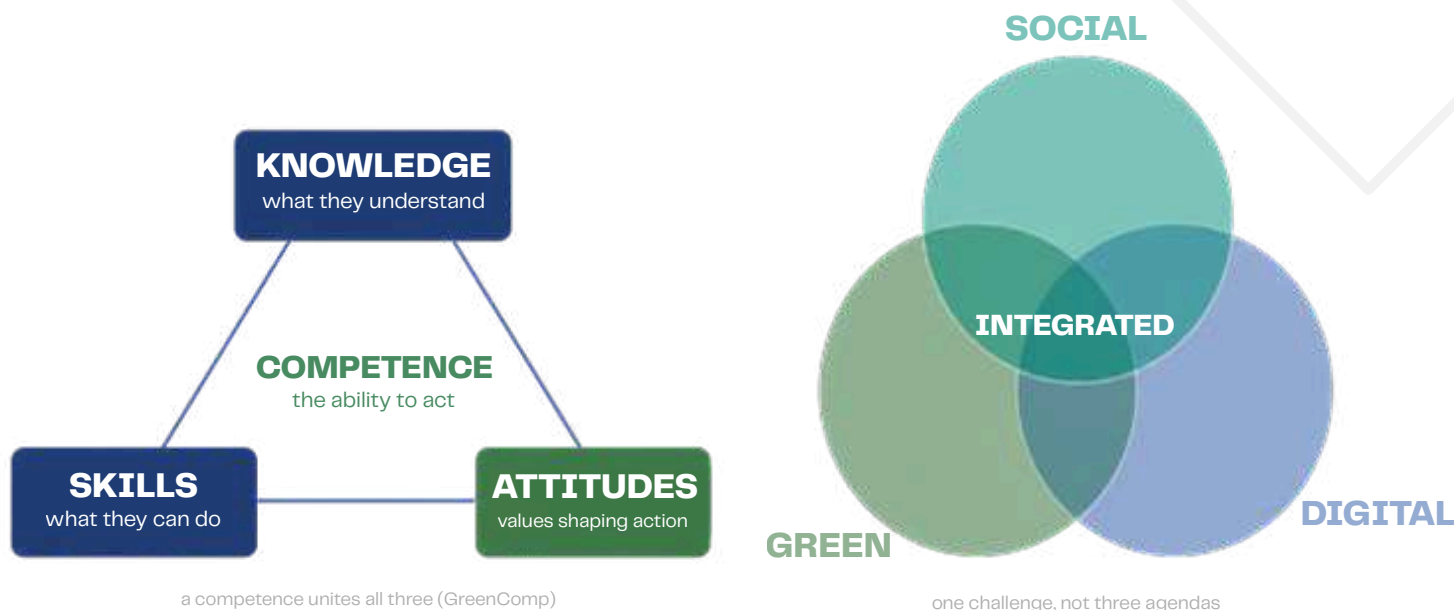


Figure 2 – What a competence is – knowledge, skills and attitudes mobilised to act – and what ‘integrated’ means: green, digital and economic as one challenge.

2.1.1 Knowledge, Skills, Attitudes and Behaviours

Skills.

Formulating indicators and evaluation questions; designing simple data-collection instruments; analysing quantitative and qualitative evidence; presenting findings clearly; and facilitating review discussions that end in decisions.

Knowledge.

The logic of the results chain from inputs and outputs to outcomes and impact; European quality-assurance references, above all EQAVET; basic data-protection and research-ethics principles; and the institution’s own data landscape and reporting obligations.

Attitudes and behaviours.

Openness to critique and to inconvenient findings; honesty in reporting – including what is not working; curiosity about causes rather than blame; and the settled habit of asking ‘how do we know?’ before claiming success. The full attribute set, with descriptors at each level, is presented in the Competence 3 tables later in this Part.

2.1.2 Progression Levels



Basic.

Applies given indicators and collects data with guidance; reports results descriptively; participates in reviews led by others.



Intermediate.

Independently designs indicators with baselines and targets; analyses trends and drafts findings; leads programme-level reviews and proposes improvements.



Advanced.

Builds and maintains an institution-wide evaluation framework; integrates evaluation into quality assurance and strategy; coaches colleagues, and uses evidence to influence institutional and partner decisions.

2.2 The architecture of the framework: ten competences and four themes

The framework comprises ten key competence areas, which fall into three natural groups. A strategic and leadership group governs the transition: Leading Sustainable Transformation (1), Analysing Contexts and Designing Sustainability Roadmaps (2), and Evaluating and Reviewing for Improvement (3). A delivery and pedagogy group carries it into learning: Innovating Educational Approaches in Curricula (4), Digital and AI Tools for Sustainability Education (5), and Collaboration for Work-Based Sustainability Learning and Stakeholder Engagement (6). And an enabling and mindset group sustains and deepens it: Fostering Sustainable Entrepreneurship and Innovation (7), an Ethical, Responsible and Reflective Sustainability Mindset (8), Resources Management Optimisation (9), and Forecasting Sustainability Changes and Challenges (10).

Running through these ten competences are four strategic themes that connect them to the levers of institutional transformation. **Sustainability governance and leadership** is carried chiefly by competences 1 to 3, which set direction, plan and evaluate. **Green skills** — the capacity to build environmental sustainability into teaching, enterprise and the management of resources — runs through competences 4, 7 and 9. **Digital innovation** is concentrated in competence 5, the responsible use of digital and AI tools for sustainability education. And **work-based sustainability learning** is the province of competence 6, which connects the institution to employers and the community. Reading the ten competences against these four themes shows how the model translates the broad ambitions of the twin transition into specific, developable capabilities.

2.3 Developing the competences: approaches, methods and supporting theories

The competences in this framework are built through active, experiential engagement rather than transmission: they develop when educators and leaders practise them in authentic contexts and reflect on the experience. Six complementary traditions from learning theory underpin how the X-VET competences – and the professional development around them – are best designed.

2.3.1 Experiential Learning

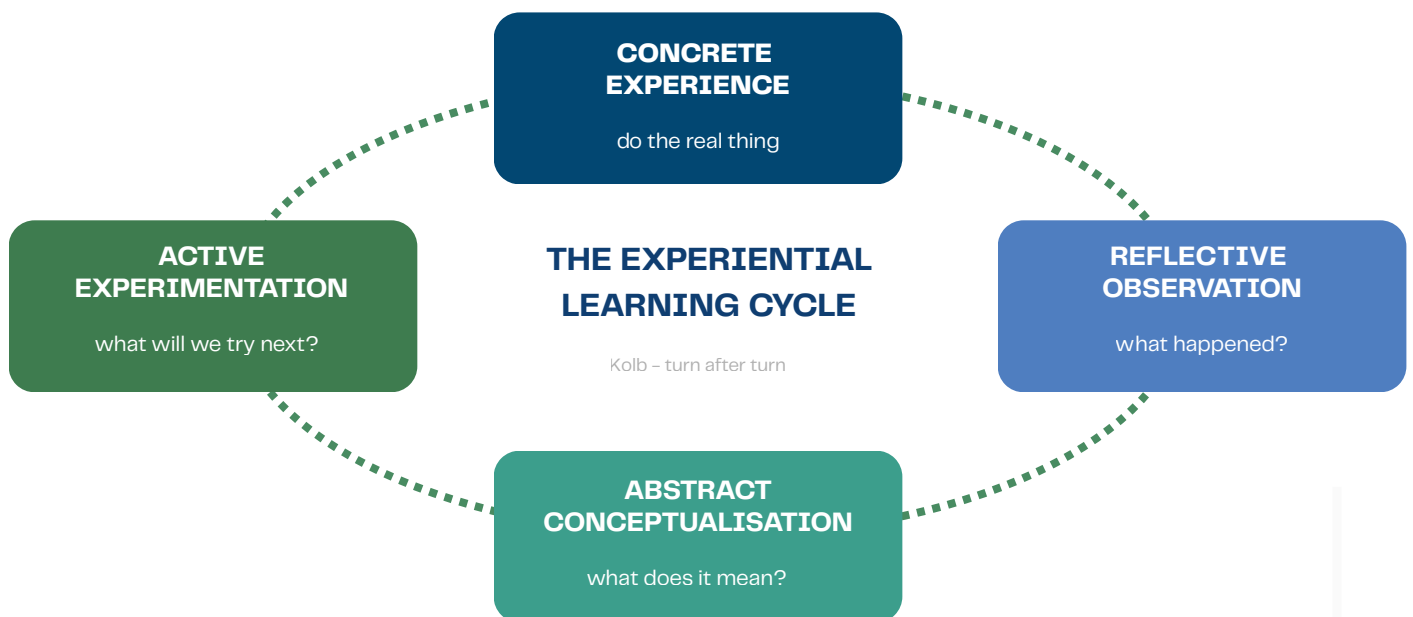


Figure 3 – Kolb's experiential learning cycle: experience becomes learning only when it is processed.

David Kolb's experiential learning theory (1984) gave formal shape to an insight every workshop has always known: people learn most durably from experience – but only when that experience is processed. Kolb describes learning as a repeating four-stage cycle. It begins with concrete experience, doing the real thing; moves to reflective observation, looking honestly at what happened; deepens into abstract conceptualisation, drawing out the principles behind it; and returns to action through active experimentation, testing the new understanding in the next attempt. Each turn of the cycle raises capability. Skipping stages is what turns potential learning into mere activity: experience without reflection produces busyness, while concepts without experimentation produce theory that never changes practice.

Vocational education is the natural home of this cycle — its workshops, kitchens and sites already run on learning by doing — and sustainability simply gives the cycle new content. An energy audit of the institution's own workshop is a concrete experience; a structured debrief turns it into reflection; the principles of efficiency and circularity emerge as concepts; and a redesigned work routine becomes the next experiment. The Whole-Organisation Approach of Part I matters here precisely because it supplies experience: a campus run as a living lab generates an endless stream of authentic situations from which staff and learners can complete the cycle together.

For X-VET, the design implication is that every professional-development activity should be a full turn of the wheel: a real task, protected time to reflect, a compact conceptual input, and a committed next experiment — never the conceptual input alone. Steps 4, 6 and 7 of the Process Model are the institution's experience engines, and the artefacts their toolkits produce are the natural evidence of the cycle at work. One warning from practice: the reflective stages are the ones institutions cut first when time is short. Protect them — they are where the learning actually happens.

2.3.2 Andragogy: How Adults Learn

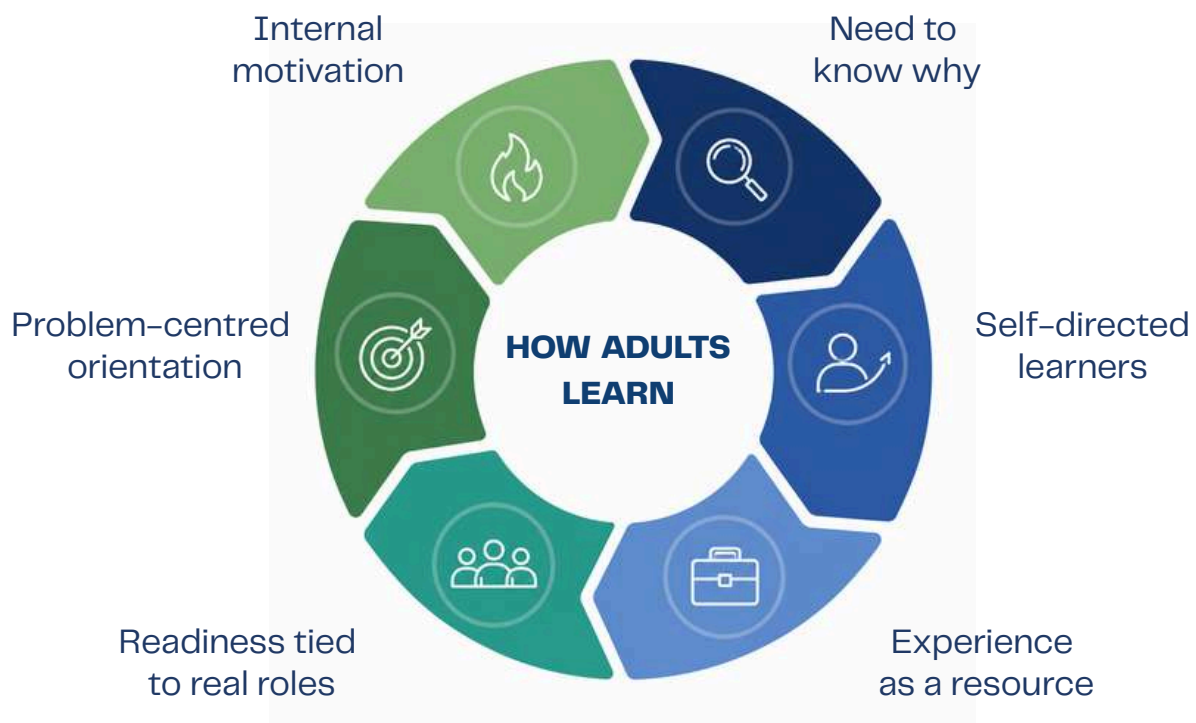


Figure 4 – Knowles' six assumptions of andragogy: the conditions under which adults learn best.

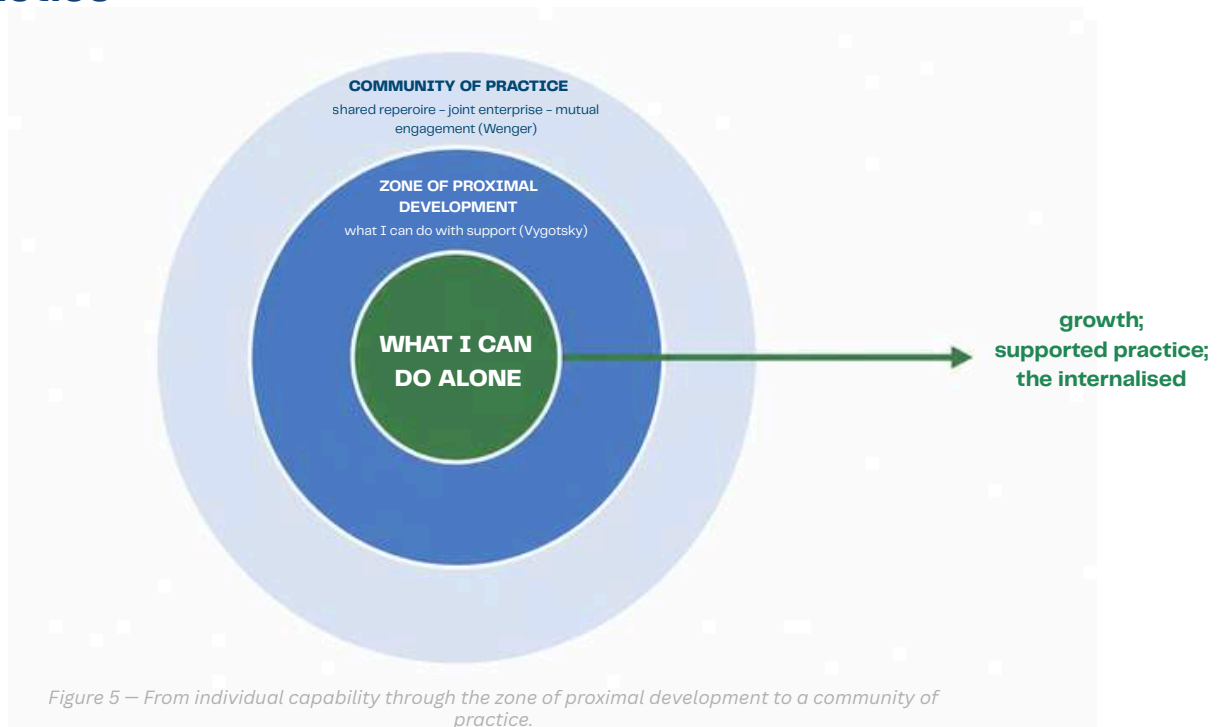
Andragogy — the art and science of helping adults learn, developed above all by Malcolm Knowles — rests on six assumptions that distinguish adult learners from children. Adults need to know why they are learning something before they invest in it; they see themselves as self-directing and resist being treated as passive recipients; they arrive with a rich reservoir of experience that is itself a learning resource; their readiness to learn is tied to the demands of their real roles; their orientation is problem-centred rather than subject-centred; and their strongest motivation is internal — purpose, growth and professional pride rather than external reward.

Every one of these assumptions bears directly on how sustainability competences are built in a VET institution. The educators and leaders this framework addresses are experienced professionals: their trade expertise is the raw material, not an obstacle, so peer exchange and cases drawn from their own occupations beat generic content every time. Development should start from their live problems — my curriculum, my workshop, my budget — and the ‘why’ should be made explicit through the policy relevance set out in Part I rather than asserted as compliance. Choice matters too: pathways, options and self-paced elements honour self-direction where a fixed syllabus undermines it.

X-VET applies andragogy structurally. Self-assessment against the competence framework is an instrument of self-direction — each professional locates their own level and names their own next step. The reading pathways at the front of this workbook, and toolkits designed to be picked up when needed rather than completed as a course, follow the same logic; facilitators work best as co-enquirers, not instructors. A warning: mandatory, one-size-fits-all training violates every assumption at once — when it meets resistance, the problem is usually the format, not the audience.



2.3.3 Social Constructivism and Communities of Practice



Social constructivism holds that knowledge is built between people before it is owned by individuals. Lev Vygotsky's central concept is the zone of proximal development: the space between what a person can do alone and what they can do with the support of a more capable other. Learning happens in that zone – through demonstration, dialogue and guided attempt – and is then internalised as independent capability. Étienne Wenger (1998) extended the social view to whole groups: a community of practice is defined by mutual engagement, a joint enterprise and a shared repertoire, and competence lives in such communities, with newcomers learning through legitimate participation at the edge of real work.

For the ten X-VET competences, the implication is blunt: they will not spread through documents or one-off training, but through structured collaboration. Curriculum design teams that rewrite modules together, peer observation between colleagues, cross-departmental green teams, and the partner consortium itself are all communities of practice in which the framework's language and standards become shared. The zone of proximal development argues for deliberate pairing – a teacher new to sustainability co-planning with an experienced one, a coordinator shadowing a peer institution – and Step 7's mentored placements apply exactly the same logic to learners in the workplace.

Institutionally, the task is to build the containers in which this social learning can occur: timetabled team slots, a shared method bank (Step 4), common templates and rubrics, and the common vocabulary this framework provides. A warning from Wenger's own work: communities need joint work, not just joint meetings. A community of practice that produces nothing together – no module, no tool, no decision – quietly decays into a committee.

2.3.4 Transformative Learning

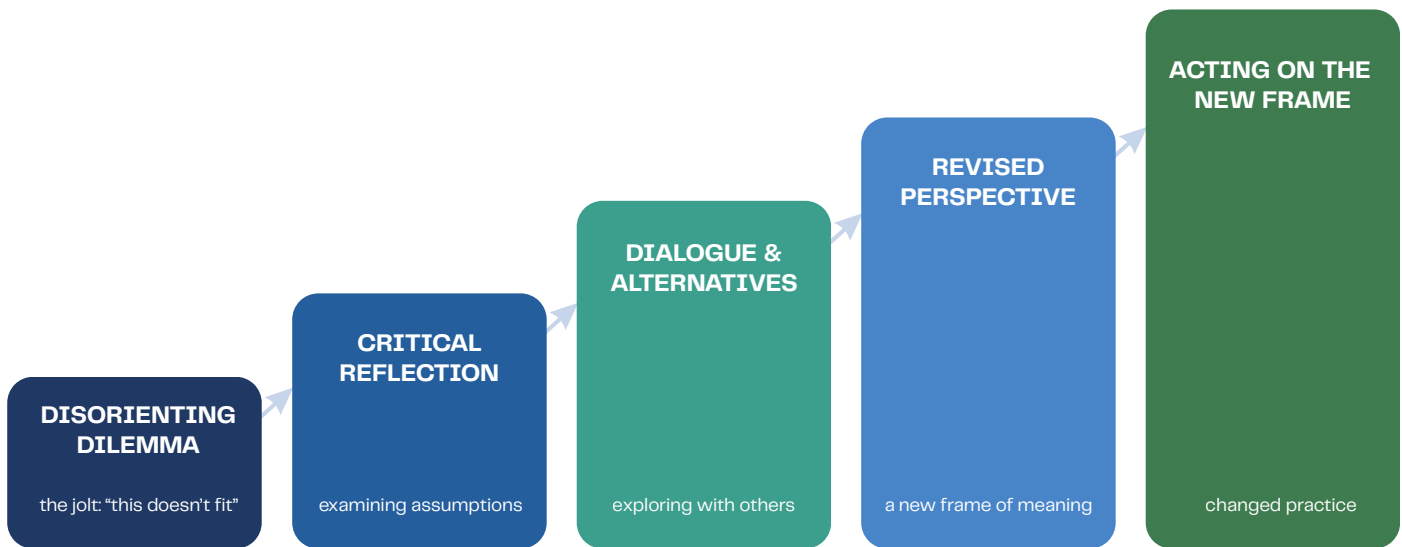


Figure 6 – Mezirow's transformative learning: from disorienting dilemma to changed practice.

Jack Mezirow's theory of transformative learning (1991) describes the deepest kind of adult learning: not the addition of new information, but the revision of the frames of meaning through which we interpret the world. The journey typically begins with a disorienting dilemma – an experience that will not fit existing assumptions – and proceeds through critical reflection on those assumptions, dialogue with others, the exploration of alternatives, and finally reintegration: acting from a revised perspective. What changes is not what the learner knows but how they see.

Sustainability is inherently transformative territory, because it questions assumptions most professionals have never had to examine: that materials are cheap, that waste is normal, that 'how our trade has always worked' is how it must work. Effective development therefore designs disorienting encounters deliberately – auditing the footprint of one's own workshop, visiting a circular business doing the same trade profitably in a different way, hearing learners challenge staff about the future of their occupation – and then holds space for genuine dialogue. Discomfort without reflection hardens into defensiveness; discomfort with reflection becomes the shift.

Within X-VET, Competence 8 – the ethical, responsible and reflective sustainability mindset – is the transformative core of the framework, and the stakeholder dialogue of Step 2 and the honest, evidence-bound communication of Step 9 both create the encounters in which perspectives move. A warning: transformation cannot be scheduled or forced. Design invitations, not conversions – and treat resistance not as failure but as the visible surface of assumptions doing their work.

2.3.5 Reflective Practice

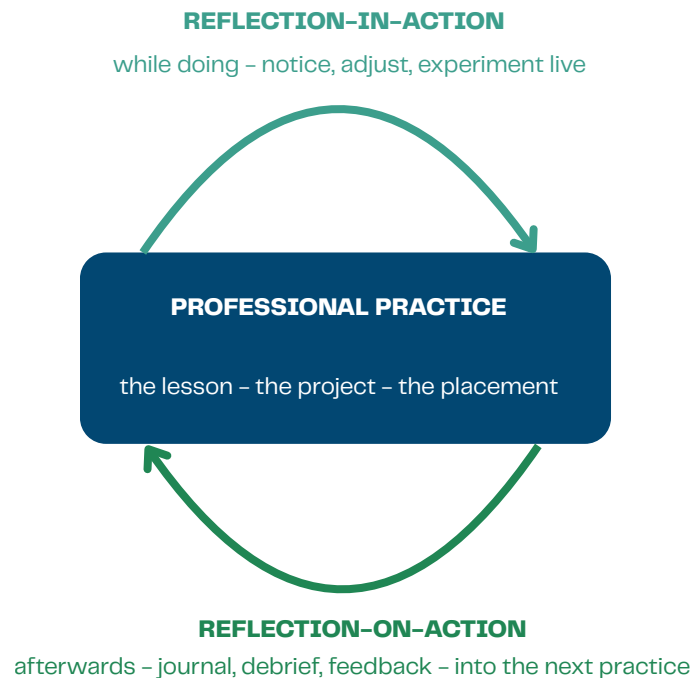


Figure 7 – Schön's two loops: reflecting in action while doing, and on action afterwards.

Donald Schön's *The Reflective Practitioner* (1983) overturned the idea that professionals simply apply theory to practice. Skilled practitioners, he showed, think in action: they hold a repertoire of tacit knowing and adjust continuously as situations talk back to them. Schön named two loops. Reflection-in-action happens while doing – noticing that the lesson is drifting, experimenting with a different explanation mid-flow. Reflection-on-action happens afterwards – the journal entry, the team debrief, the learner feedback that surfaces what was tacit and turns it into deliberate capability for next time. Professional artistry is the product of both loops running together.

For sustainability education this matters doubly, because most educators are working new terrain without an established routine to lean on. Reflective capacity is the safety net that makes experimentation safe: staff need explicit permission to adjust live, and lightweight structures for the second loop – a two-line journal prompt after a pilot lesson, a fifteen-minute team debrief each week, learner feedback treated as data rather than judgement. Institutions that build these small habits find that innovations improve between iterations instead of being abandoned after a rough first attempt.

In X-VET terms, the personal reflective loop feeds the institutional one: the evaluative discipline of Competence 3 is reflection-on-action scaled to the whole organisation, and the review moments built into the toolkits – the pilot reviews of Step 4, the three-way placement reviews of Step 7 – are its formalised instruments. A warning: reflection is a habit, not paperwork. Two honest lines beat a template filled in ritually.

2.3.6 Competence-Based and Work-Based Development



Figure 8 – The competence-evidence chain: authentic tasks, real performance, captured evidence, transparent judgement.

The final tradition follows from the definition of competence itself: if competence is the ability to perform, it can only be developed – and only be assessed – through performance. Competence-based development therefore replaces proxy tests with authentic tasks and evidence: portfolios, observed practice, real deliverables, judged against transparent standards rather than recall. Work-based learning extends the principle to its natural conclusion by making the real workplace the development site, where consequences are real and the standards are those of the occupation itself.

X-VET operationalises this chain end to end. The Basic–Intermediate–Advanced descriptors are the transparent standard; typical evidence sources are named for each competence; and the development itself happens by doing the ten steps – designing a roadmap builds Competence 2, running the monitoring cycle builds Competence 3, brokering placements builds Competence 6. The artefacts each toolkit produces – canvases, registers, agreements, review records – are simultaneously working documents and assessment evidence, which is why the Framework and the Process Model function as two sides of one design.

Three design rules follow for anyone building development around this framework. Define the evidence before the learning: ask ‘what would show it?’ first. Prefer one authentic deliverable to three simulated exercises. And make judgement dialogic – self-assessment, peer view and assessor view together, as in the three voices of Step 7’s placement review. A warning: competence-based is not checklist-based. The descriptors describe the quality of a performance; ticking their words without the performance behind them evidences nothing.

Competence 1 – Leading Sustainable Transformation

DIMENSION OF THE KEY COMPETENCE AREA:

Leading Sustainable Transformation

Vocational education and training sits at the centre of Europe's twin green and digital transition, yet the leadership capacity needed to drive that transition through institutions remains uneven and underdeveloped. The European Green Deal (European Commission, 2019) sets a binding direction of travel towards climate neutrality by 2050, and the Council Recommendation of 16 June 2022 on learning for the green transition and sustainable development asks education and training providers to adopt a whole-institution approach, embedding sustainability not only in curricula but in vision, planning, governance, resource management and community partnerships. In practice, however, sustainability in many VET institutions still depends on isolated champions and short-lived project funding rather than on leaders able to translate ambition into durable institutional strategy. GreenComp, the European sustainability competence framework (Bianchi, Pisiotis and Cabrera Giraldez, 2022), makes clear that acting for sustainability is a competence to be developed deliberately, combining knowledge, skills and attitudes, and not an attribute assumed to be already present. For institutional leaders, this competence turns commitments into strategy that accounts for readiness, risk and resources; for educators, it provides the mandate and shared responsibility to change practice; for learners, it models the purposeful decision-making the labour market increasingly demands. Where this leadership is absent, sustainability efforts stay symbolic, fragmented and vulnerable to reversal – the opposite of the systemic transformation the twin transition requires.

ATTRIBUTES OF THE KEY COMPETENCE AREA:

Leading Sustainable Transformation

Importance for Integrated Sustainability for Green, Digital and Economic Transformations in VET: Leadership decides whether sustainability becomes a whole-institution commitment or stays a scattering of projects. This competence turns the ambitions of the European Green Deal and the twin transition into a shared institutional vision, mobilises staff and resources behind it, and anchors accountability – so that green, digital and economic transformation is steered deliberately rather than left to individual enthusiasm.

Basic level

SKILLS

- Apply the essential concept of sustainability and executing basic sustainability-related tasks
- Identify resource-efficiency opportunities (e.g. waste sorting, energy efficiency steps, ...)
- Communicate and raise awareness about sustainability goals and challenges

KNOWLEDGE

- Understand the definition and benefits of sustainability, green and digital transition
- Know the basic framework of sustainability and be aware of the organisation's sustainability commitments, roles and values
- Know simple examples of sustainable practices relevant to their area

ATTITUDES & BEHAVIOURS

- General problem awareness
- Willingness to rethink practices in regard to sustainability
- Feeling the necessity of broadening one's own concepts in regard to sustainability

Intermediate level

SKILLS

- Identify and implement process improvements that enhance resource efficiency and to reduce environmental impact
- Analyse different alternative sustainability solutions
- Apply sustainable change management tools to support adaptation of practices

KNOWLEDGE

- Recognise and understand the key institutional policies, strategies of sustainability and the ecosystem
- Have practical knowledge of tools supporting monitoring, evaluation and reporting of sustainability actions
- Expertise in impact measurements, including KPIs, reporting frameworks (ESG, SDGs) of sustainability

ATTITUDES & BEHAVIOURS

- Cultivate a sustainability-aware perspective
- Evaluative attitude and openness towards practices in regard to sustainability
- Concept-critical attitude

Advanced level

SKILLS

- Develop a sustainability framework tailored on the specific organization's needs and possibilities
- Design and steer long term sustainability transformation strategies across the institution
- Lead complex, cross-functional sustainability initiatives involving multiple internal and external stakeholders

KNOWLEDGE

- Familiarise with the "Human-First AI approach"
- Knowledge of emerging technologies and advanced transformation methods
- Understanding of funding mechanisms, partnerships, and innovation ecosystems that accelerate sustainable transformation

ATTITUDES & BEHAVIOURS

- Emphasize the need of a sustainability-aware perspective-change
- Innovative attitude towards practices in regard to sustainability
- Adaptive attitude toward concepts of advanced sustainability transformation

Suggested Self-Directed Learning Activities

SKILLS

- Conduct a mini-audit of a specific unit or workflow (energy use, waste streams, digital processes) and propose improvement actions
- Facilitate a green or digital improvement workshop using simple tools like process mapping or root-cause analysis
- Lead a small pilot project (e.g., "Reduce paper use by 20%", ...)

KNOWLEDGE

- Enrol in micro-learning modules on sustainability topics (SDGs, circular economy, ESG, climate literacy, digital transformation)
- Review case studies from leading VET institutions or industry on successful sustainability transformation
- Explore institutional sustainability reports and KPIs to learn how progress is measured

ATTITUDES & BEHAVIOURS

- Keep a reflective journal documenting sustainability challenges, insights, and behaviour changes over time
- Join peer-learning circles or communities of practice on sustainable leadership or digital innovation
- Participate in cross-departmental discussions to broaden perspectives on sustainability issues

Examples of Relevant Programs, Initiatives, or Projects to learn in Groups

SKILLS

- **The Course on Strategic leadership for Sustainable Transformation (ESCP)**  [Link](#)

KNOWLEDGE

- **GreenComp**  [Link](#)
- **UN Executive Leadership Programme for Sustainable Development Leading for Systems Transformation**  [Link](#)

ATTITUDES & BEHAVIOURS

- **EC. (2024). Corporate sustainability due diligence directive**  [Link](#)
- **EC. (2022). Corporate Sustainability Reporting Directive**  [Link](#)
- **Become a Pact Ambassador**  [Link](#)

Competence 2 – Analysing Contexts and Designing Sustainability Roadmaps

DIMENSION OF THE KEY COMPETENCE AREA: Analysing Contexts and Designing Sustainability Roadmaps

Many VET institutions are committed to sustainability in principle but struggle to translate that commitment into an evidence-based, context-specific strategy. Ambition tends to outrun analysis: goals are declared without a clear reading of institutional readiness, regulatory requirements, stakeholder dynamics or resource constraints, and without measurable targets against which progress can be judged. The Council Recommendation of 16 June 2022 on learning for the green transition and sustainable development explicitly links a whole-institution approach to planning and governance, implying that institutions must be able to diagnose their own situation before they can act on it. GreenComp (Bianchi, Pisiotis and Cabrera Giraldez, 2022) frames this capacity through the competences of embracing complexity and envisioning sustainable futures, while European skills-anticipation work by CEDEFOP underlines how important it is to read sector and labour-market signals when planning for the green transition. This competence area equips practitioners to conduct structured context analysis, interpret qualitative and quantitative evidence, and design realistic sustainability roadmaps with clear priorities, milestones, targets and KPIs aligned to EU frameworks. For leaders it converts ambition into a governable plan; for educators it allows sustainability priorities to be built into curriculum and learning design; for learners it develops the ability to analyse a sustainability challenge in their sector and propose a coherent way forward.

ATTRIBUTES OF THE KEY COMPETENCE AREA: Leading Sustainable Transformation

Importance for Integrated Sustainability for Green, Digital and Economic Transformations in VET: No two institutions begin the transition from the same place. This competence enables VET providers to read their own context – needs, readiness, policies and stakeholder dynamics – and to turn that analysis into a realistic roadmap with priorities, targets and KPIs. It is the bridge between commitment and delivery, ensuring that green, digital and economic change is planned on evidence rather than on assumption.

For institutional leaders: it helps leaders turn sustainability ambitions into an institutional strategy considering readiness, risks, resources align with the EU policies, when setting targets and KPIs.

For educators / trainers: it enables them to integrate sustainability priorities into relevant curriculum and learning design, model decision-making for learners, and collaborate with stakeholders.

For students: it equips students to understand sustainability challenges in their sector, and cross-sectoral, propose roadmaps with steps, priorities, and results.

Basic level

SKILLS

- Identify basic contextual factors affecting sustainability planning.
- Identify some of the main internal and external factors (e.g., regulations, resources) relevant to a sustainability challenge.
- Identify the core problem in a general sense.

KNOWLEDGE

- Basic familiarity with common sustainability challenges (e.g., waste, energy).
- Awareness of fundamental sustainability concepts (green/digital/economic).
- Understands that roadmaps guide long-term improvement but may not fully grasp the methodology.

ATTITUDES & BEHAVIOURS

- Shows openness to learning and acknowledges gaps in understanding.
- Displays willingness to collaborate when guided.
- Accepts feedback and external guidance and the need for sustainable practices.

Intermediate level

SKILLS

- Conduct structured context analyses using common tools (SWOT, PESTLE).
- Interpret internal and external data to identify challenges and opportunities.
- Draft sustainability and coherent roadmaps with clear priorities and milestones.

KNOWLEDGE

- Understands institutional policies, stakeholder roles, and sustainability requirements.
- Understands how sustainability roadmaps align with strategic goals and EU frameworks.
- Knowledge of effective roadmapping principles (phasing, targets, KPIs).

ATTITUDES & BEHAVIOURS

- Demonstrates proactive engagement in collaborative planning.
- Values evidence-based decision-making.
- Shows responsibility for implementing agreed actions.

Advanced level

SKILLS

- Lead complex institutional assessments integrating green, digital, and economic dimensions.
- Design comprehensive roadmaps with KPIs, monitoring tools, and adaptive mechanisms.
- Facilitate stakeholder dialogue and build multi-level partnerships for transformation.

KNOWLEDGE

- Deep understanding of sustainability systems, policy landscapes, and transformation models.
- Expert knowledge of roadmap methodologies, evaluation frameworks, and governance structures.
- Understands European sustainability frameworks and cross-sectoral synergies.

ATTITUDES & BEHAVIOURS

- Advocates for ambitious, long-term sustainability visions and sustainability goals.
- Champions innovation, resilience, and continuous improvement.
- Acts as a change agent within and beyond the institution.

Suggested Self-Directed Learning Activities

SKILLS	KNOWLEDGE	ATTITUDES & BEHAVIOURS
• Practise applying analytical tools (SWOT, PESTLE, stakeholder mapping). • Conduct small-scale audits or diagnostics within the institution. • Draft or compare sustainability roadmaps using real institutional examples. • Use online learning platforms (MOOCs, webinars) to practise designing strategic actions. • Prepare short summaries or reflections after independent study activities. • Select a personal goal and design a 3-year roadmap with quarterly milestones.	• Deepen understanding of sustainability frameworks (GreenComp, DigComp, EntreComp, DEAP). • Learn how sustainability transitions have been approached in VET case studies (CEDEFOP, UNESCO-UNEVOC). • Understand different roadmap methodologies and indicators used in European projects. • Acquire conceptual knowledge on strategy design, sustainability leadership, and digital transformation. • Build awareness of how external policies and programmes shape institutional sustainability development. • Learn the structure and purpose of the UN Sustainable Development Goals (SDGs).	• Show curiosity and willingness to explore complex institutional contexts. • Demonstrate reflective thinking about current practices and areas for improvement. • Value evidence-based planning and continuous learning. • Maintain motivation for self-improvement and long-term transformation. • Engage with learning proactively and share insights with peers. • Practice formulating "SMART" goals specifically for environmental or social targets.

Examples of Relevant Programs, Initiatives, or Projects to learn in Groups

SKILLS

- 
Analyse institutional transformation models used in international VET projects, for example, the UNESCO-UNEVOC TVET Toolkits database for selecting a greening or digitalisation toolkit and applying it to your institution
 [Link](#)
- 
Compare strategic planning practices across different CEDEFOP toolkits, for example, select several cases, analyse and integrate to your roadmap
 [Link](#)
- 
Identify elements of effective sustainability roadmaps through Erasmus+ examples.

- Evaluate real sustainability and digital transformation initiatives (EU, national, regional) (e.g., the EU Cities Mission resources)  [Link](#)
- Facilitate group discussions based on case studies from Smart City or circular economy models, e.g. example, <https://smart-cities-marketplace.ec.europa.eu/>, and transform them into VET institution action plan,  [Link](#)

KNOWLEDGE

- Understand the methodology behind UNESCO-UNEVOC's Greening TVET approach. For example, study the Greening TVET for a greener future (institutional approaches, indicators, monitoring)  [Link](#)
- Learn how CEDEFOP frameworks support needs analysis, skills anticipation, and systemic change. E.g., Cedefop-UNEVOC practical guide 4 "Meeting skill needs for the green transition. Skills anticipation and VET for a greener future"  [Link](#)
- Understand policy frameworks such as the EU Green Deal, Circular Economy Action Plan, Digital Education Action Plan. Communication from the EC, The European Green Deal <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52019DC0640> and A new Circular Economy Action Plan <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52020DC0098>
- Build knowledge on cross-sectoral sustainability practices relevant for VET ecosystems. The Digital Education Action Plan for the roadmap on twin transition  [Link](#)

ATTITUDES & BEHAVIOURS

- Value collaborative learning and global perspectives. (e.g., GreenVET Pathway Community of Practice)  [Link](#)
- Show openness to cross-institutional and cross-national cooperation. (NetZeroCities / EU Cities Mission platform for shared innovative ecosystems and roadmaps):  [Link](#)
- Appreciate innovation and experimentation within group settings.  [Link](#)
- Demonstrate engagement with societal challenges and shared responsibility. (e.g. European Forum of Technical and Vocational Education and Training)  [Link](#)
- Promote dialogue, inclusivity, and multiple perspectives.

Competence 3 – Evaluating and Reviewing for Improvement

DIMENSION OF THE KEY COMPETENCE AREA:

Evaluating and Reviewing for Improvement

Sustainability initiatives in VET are frequently launched but rarely evaluated, so institutions cannot tell what is working, cannot demonstrate impact to funders or partners, and cannot improve in a systematic way. Without evidence, sustainability risks becoming a matter of good intentions and one-off projects rather than of measurable, continuous progress. The Council Recommendation of 16 June 2022 addresses this directly by encouraging institutions to make sustainability part of their internal and external review and quality-assurance mechanisms, connecting the agenda to established VET quality frameworks such as EQAVET. This competence area builds the capacity to decide what should be measured, to gather reliable qualitative and quantitative data, to interpret it in relation to green, digital and economic outcomes, and to turn findings into concrete improvements. It draws on recognised evaluation approaches – from simple feedback tools at Basic level to theory-of-change and balanced-scorecard thinking at Advanced level – and increasingly on digital analytics for real-time monitoring. For leaders it grounds decision-making in evidence; for educators it supports reflective practice and programme enhancement; for learners it develops the habit of reviewing performance honestly and acting on what the evidence shows. The result is a culture of continuous improvement in which sustainability claims can be substantiated rather than merely asserted.

ATTRIBUTES OF THE KEY COMPETENCE AREA:

Evaluating and Reviewing for Improvement

Importance for Integrated Sustainability for Green, Digital and Economic Transformations in VET: Sustainability claims must be demonstrable. This competence equips institutions to gather evidence, track indicators and judge whether actions create real educational, environmental and economic value – and to feed the findings back into programmes and strategy. It underpins quality assurance in the spirit of EQAVET, satisfies funders and inspectors, and turns the transition into a continuously improving cycle.

Basic level

SKILLS

- Collect simple feedback from learners or colleagues
- Use basic tools (e.g., checklists, simple surveys) to identify areas for improvement.
- Observe and describe performance gaps without detailed analysis.

KNOWLEDGE

- Understands the basic purpose of evaluation and review.
- Knows simple methods for gathering feedback and performance data.
- Recognises fundamental sustainability indicators in VET contexts.

ATTITUDES & BEHAVIOURS

- Shows willingness to receive feedback.
- Demonstrates curiosity about improving practices.
- Accepts that evaluation is part of learning and development.

Intermediate level

SKILLS

- Apply structured evaluation methods (rubrics, KPIs, digital analytics).
- Analyse strengths, weaknesses, opportunities, and threats (SWOT).
- Integrate sustainability criteria into evaluation processes.

KNOWLEDGE

- Understands frameworks for quality assurance and continuous improvement.
- Knows how digital tools support data collection and analysis.
- Understands green and economic sustainability indicators relevant to VET programs.

ATTITUDES & BEHAVIOURS

- Takes responsibility for ongoing improvement.
- Demonstrates reflective thinking and openness to change.
- Collaborates with others to optimise outcomes.

Advanced level

SKILLS

- Design and lead comprehensive evaluation systems aligned with sustainability goals.
- Interpret complex datasets and transform insights into strategic actions.
- Facilitate reflective practice, innovation cycles, and organisational learning.

KNOWLEDGE

- Advanced understanding of evaluation models (e.g., Theory of Change, Balanced Scorecards).
- Deep knowledge of sustainability metrics (environmental impact, digital maturity, economic effectiveness).
- Expertise in using advanced digital tools for real-time monitoring and predictive analysis.

ATTITUDES & BEHAVIOURS

- Champions a culture of continuous improvement and sustainability.
- Models evidence-informed decision making.
- Encourages experimentation, innovation, and adaptive thinking.

Suggested Self-Directed Learning Activities

SKILLS	KNOWLEDGE	ATTITUDES & BEHAVIOURS
- Review case studies of successful sustainability transformations. - Complete a short course on continuous improvement or evaluation methods - Study international sustainability standards or frameworks (e.g., SDGs, ESG criteria).	- Conduct a personal SWOT analysis on your work processes. - Practice using digital analytics tools (e.g., dashboards, LMS analytics). - Experiment with sustainability assessment tools (carbon footprint calculators, energy trackers).	- Keep a reflective journal to track improvement over time. - Set monthly personal improvement goals and review your progress honestly. - Practice a “3Qs reflection” after tasks: What worked? What didn’t? What will I change?

Examples of Relevant Programs, Initiatives, or Projects to learn in Groups

SKILLS

- Researching results of projects supported by Erasmus+, Nordplus, Interreg, ESF, European Green Deal Projects related to sustainability.
- Involvement in community green innovation challenges or hackathons.
- Engaging in VET sector benchmarking projects to compare sustainability performance.

KNOWLEDGE

- Participating in Erasmus+, Nordplus, Interreg, ESF, European Green Deal Projects projects related to sustainability. Generating ideas and developing project proposals
- Creating a cross-department improvement committee that monitors progress and suggests changes.

ATTITUDES & BEHAVIOURS

- Promoting results of Erasmus+, Nordplus, Interreg, ESF, European Green Deal Projects projects related to sustainability
- Team reflection sessions using data dashboards for program improvement.

Competence 4 – Innovating Educational Approaches in Curricula

DIMENSION OF THE KEY COMPETENCE AREA: Innovating Educational Approaches in Curricula

Sustainability is too often taught as abstract content – delivered through lectures and assessed through recall – when the competences it requires are practical, applied and behavioural, and can only be developed through active learning. A gap therefore opens between what learners know about sustainability and what they are able to do, and many educators lack confidence in the learner-centred pedagogies that would close it. The Council Recommendation of 16 June 2022 calls explicitly for learning that is hands-on, interdisciplinary and relevant to local concerns, and GreenComp's emphasis on acting for sustainability (Bianchi, Pisiotis and Cabrera Giraldez, 2022) makes competence, not information, the goal of teaching. This competence area supports educators to design and deliver learner-centred, experiential and project-based approaches in which learners tackle real sustainability challenges from their sector and community. It moves the educator's role from lecturer to facilitator and treats the curriculum as something to be redesigned rather than merely supplemented. For institutions it drives genuine pedagogical reform; for educators it provides a repertoire of methods – project-based learning, flipped and experiential formats, cross-curricular design – that make sustainability meaningful; and for learners it builds the transferable capabilities, from problem-solving to collaboration, that sustainable practice demands in the workplace.

ATTRIBUTES OF THE KEY COMPETENCE AREA: Innovating Educational Approaches in Curricula

Importance for Integrated Sustainability for Green, Digital and Economic Transformations in VET: Sustainability cannot simply be transmitted through lectures; it is learned by doing. This competence enables educators to design learner-centred, experiential and project-based approaches in which learners tackle real green, digital and economic challenges. It converts curriculum intentions into classroom reality, closes the knowing-doing gap, and builds the applied competence that twin-transition employers need.

Basic level

SKILLS

- Identify existing teaching materials that touch on sustainability.
- Assist in basic classroom activities involving sustainability topics.

KNOWLEDGE

- Understand the definition of learner-centred and project-based learning.
- Recognize basic sustainability themes within a specific subject area.

ATTITUDES & BEHAVIOURS

- Openness to trying new teaching methods.
- Willingness to move away from purely lecture-based instruction.

Intermediate level

SKILLS

- Adapt existing curricula to include practical sustainability projects.
- Facilitate experiential learning sessions where students solve local environmental issues.

KNOWLEDGE

- Knowledge of how to design project-based learning (PBL) modules.
- Understanding of various pedagogical tools that foster sustainability thinking.

ATTITUDES & BEHAVIOURS

- Proactive in designing engaging student experiences.
- Valuing the role of the teacher as a facilitator rather than a lecturer.

Advanced level

SKILLS

- Lead the design of entire cross-curricular sustainability programs.
- Mentor other educators in implementing innovative, high-impact educational models.

KNOWLEDGE

- Deep expertise in transformative education and complex pedagogical frameworks.
- Knowledge of global trends in sustainability education and curriculum innovation.

ATTITUDES & BEHAVIOURS

- Championing educational reform within the institution.
- Commitment to continuous pedagogical experimentation and improvement.

Suggested Self-Directed Learning Activities

SKILLS

- Explore repositories of Project-Based Learning (PBL) case studies related to the environment.

KNOWLEDGE

- Research "flipped classroom" models specifically applied to digital and green transitions.

ATTITUDES & BEHAVIOURS

- Create a pilot lesson plan that replaces a standard test with a real-world sustainability challenge.

Examples of Relevant Programs, Initiatives, or Projects to learn in Groups

SKILLS



GreenComp (European Sustainability Competence Framework).

KNOWLEDGE



Erasmus+ projects focused on "Innovative Pedagogy for Green VET"

ATTITUDES & BEHAVIOURS



UNESCO-UNEVOC Greening TVET practical guides for teachers.

Competence 5 – Digital and AI Tools for Sustainability Education

DIMENSION OF THE KEY COMPETENCE AREA:

Digital and AI Tools for Sustainability Education

The green and digital transitions are inseparable, yet digital and AI tools remain underused for sustainability learning, monitoring and decision-making in much of VET, and their rapid arrival brings risks as well as opportunities. Simulations, data platforms and increasingly artificial intelligence can make sustainability tangible – modelling energy use, visualising trade-offs, tracking indicators – but only if educators can select, adapt and apply them purposefully and critically. The Digital Education Action Plan 2021–2027 and the Digital Competence Framework for Citizens (DigComp) provide the European reference points for this capability, while the framing of the twin transition makes clear that digital fluency and sustainability competence now develop together rather than separately. This competence area equips practitioners to choose appropriate digital and AI tools for a given learning or monitoring purpose, to integrate them into sustainability education, and to weigh their benefits against their environmental, ethical and data-related costs. For institutions it connects the digital and green strands of strategy; for educators it turns technology from a novelty into an instrument for deeper sustainability learning and better evidence; and for learners it builds the combined green-and-digital capabilities that employers across sectors increasingly expect.

ATTRIBUTES OF THE KEY COMPETENCE AREA:

Evaluating and Reviewing for Improvement

Importance for Integrated Sustainability for Green, Digital and Economic Transformations in VET: The green transition increasingly runs on data, and education increasingly runs on digital tools. This competence enables educators to select, adapt and use technologies – including AI, simulations and data platforms – responsibly and purposefully for sustainability learning and monitoring. It joins the two halves of the twin transition in practice, putting digital capability at the service of green transformation.

Basic level

SKILLS

- Use basic digital tools to access sustainability-related learning materials and resources.
- Search and organise basic digital information relevant to vocational sustainability challenges.

KNOWLEDGE

- Basic awareness of digital learning environments and common online tools used in VET.
- Introductory understanding of digital competence, online safety, and responsible use of data.

ATTITUDES & BEHAVIOURS

- Show openness to using digital tools for sustainability learning.
- Demonstrate curiosity about new technologies and their practical relevance.

Intermediate level

SKILLS

- Select and use digital tools to support sustainability learning tasks.
- Integrate AI-supported tools into learning activities with clear pedagogical purpose.
- Evaluate digital content and AI outputs for accuracy, relevance, bias, and usefulness in VET contexts.

KNOWLEDGE

- Understand the main areas of educator digital competence, including teaching, assessment, learner empowerment, and facilitation of learners' digital competence.
- Understands key principles for the ethical use of AI and data in teaching and learning, including privacy, transparency, fairness, and human oversight.
- Know how digital technologies can support systems thinking, problem solving, and sustainability-related vocational tasks.

ATTITUDES & BEHAVIOURS

- Demonstrate a reflective and critical approach to the use of digital and AI tools.
- Value inclusion, accessibility, and learner-centred digital pedagogy.
- Show responsibility in using technology to support sustainability objectives

Advanced level

SKILLS

- Design and lead digitally enriched sustainability learning pathways across programmes
- Combine AI, digital assessment, simulations, and data tools to support authentic, work-based, and personalised learning for sustainability.
- Guide colleagues or teams in selecting, implementing, and reviewing digital and AI solutions for sustainability education.

KNOWLEDGE

- Advanced knowledge of digital education frameworks and their application in VET organisations.
- Deep understanding of ethical, pedagogical, and organisational implications of AI and data use in education.
- Knowledge of how digital transformation, green transition, and labour-market change interact in vocational learning and institutional development.

ATTITUDES & BEHAVIOURS

- Act proactively as an innovation-oriented and ethically responsible change agent.
- Promote critical thinking, evidence-based experimentation, and continuous improvement.
- Encourage a human-centred approach in which digital and AI tools serve sustainability, inclusion, and quality learning.

Suggested Self-Directed Learning Activities

SKILLS

- Test one digital tool or AI application for a sustainability-related learning task and document strengths, limits, and risks.
- Analyse a sustainability case using digital data sources, collaborative platforms, or visualisation tools.

KNOWLEDGE

- Review the European ethical guidelines on AI and data in teaching and learning.
- Explore DigComp and DigCompEdu descriptors relevant to one's role.
- Compare examples of digital tools used for sustainability education in different VET settings.

ATTITUDES & BEHAVIOURS

- Join peer exchange sessions to discuss benefits, risks, and responsible use of AI in sustainability education.
- Keep a reflective journal on how digital tools affect engagement, inclusion, and quality of sustainability learning.

Examples of Relevant Programs, Initiatives, or Projects to learn in Groups

SKILLS

- [DigComp – The European Digital Competence Framework for Citizens \(JRC / European Commission\)](#)
- [DigCompEdu – The European Framework for the Digital Competence of Educators \(JRC / European Commission\)](#)
- [Ethical guidelines on the use of artificial intelligence and data in teaching and learning for educators](#)

KNOWLEDGE

- [SELFIE / SELFIE for TEACHERS for digital capacity reflection and development in education organisations](#)
- [European Education Area resources on learning for the green transition and sustainable development.](#)

ATTITUDES & BEHAVIOURS

- Erasmus+ projects and communities focused on digital education, green education, and VET innovation.
- [European School Education Platform and EPALE resources relevant to digital and sustainability competences in VET.](#)

Competence 6 – Collaboration for Work-Based Sustainability Learning and Stakeholder Engagement

DIMENSION OF THE KEY COMPETENCE AREA: Collaboration for Work-Based Sustainability Learning and Stakeholder Engagement

Sustainable practice is learned most powerfully where education meets the world of work and the wider community, but the links between VET providers, employers and local actors are often too weak to support genuine work-based sustainability learning – and even where partnerships exist, the sustainability message is frequently communicated poorly. The Council Recommendation of 16 June 2022 places partnerships with local and wider communities at the heart of a whole-institution approach, and the priority given to work-based learning in European VET policy, including the Osnabrück Declaration (2020), underlines that authentic, applied experience is central to how vocational competence is built. This competence area develops the capacity to collaborate with companies, local authorities and community organisations to co-create meaningful sustainability projects and placements, and to communicate clearly about sustainability with diverse internal and external stakeholders. It treats stakeholder engagement and communication as a single competence, because partnerships that are not well communicated rarely endure. For institutions it embeds sustainability in real ecosystems rather than in the classroom alone; for educators it opens access to authentic challenges and expertise; and for learners it provides work-based experiences in which sustainability competences are applied, tested and refined in genuine professional settings.

ATTRIBUTES OF THE KEY COMPETENCE AREA: Evaluating and Reviewing for Improvement

Importance for Integrated Sustainability for Green, Digital and Economic Transformations in VET: Sustainability in VET is built with the world of work, not beside it. This competence enables institutions to co-create meaningful projects and placements with companies, local actors and community organisations, and to communicate clearly with diverse audiences. It grounds green and digital learning in authentic workplaces, strengthens regional partnerships, and turns employers into co-educators of the transition.

Basic level

SKILLS

- Identify internal and external stakeholders relevant to a specific work-based sustainability project.
- Communicate basic sustainability ideas clearly within a team using standard digital or verbal tools.

KNOWLEDGE

- Define the fundamental principles of stakeholder engagement and why collaboration is necessary for sustainability.
- Recognize common digital platforms and communication channels used for professional collaboration in VET settings.

ATTITUDES & BEHAVIOURS

- Willingness to listen to and respect diverse perspectives from different professional backgrounds.
- Openness to sharing information and resources with peers to support collective learning goals.

Intermediate level

SKILLS

- Facilitate routine meetings or discussions between learners and workplace mentors to monitor sustainability progress.
- Use digital collaboration tools effectively to co-create documents, track shared tasks, and manage stakeholder feedback.

KNOWLEDGE

- Understand the specific needs and motivations of different stakeholder groups (e.g., employers, local NGOs, or digital technicians) within the sustainability ecosystem.
- Identify the legal and ethical frameworks surrounding data sharing and collaborative work in a professional VET environment.

ATTITUDES & BEHAVIOURS

- Proactive approach to seeking feedback from stakeholders to improve work-based learning outcomes.
- Commitment to maintaining transparency and building trust among team members during complex green or digital transitions.

Advanced level

SKILLS

- Design and lead multi-stakeholder engagement strategies that align work-based learning with long-term corporate sustainability goals.
- Mediate conflicting interests between stakeholders to reach a consensus that balances economic viability with green and digital requirements.

KNOWLEDGE

- Analyze complex systemic interdependencies between stakeholder networks and their impact on the global sustainability value chain.
- Evaluate advanced digital ecosystems and collaborative methodologies (e.g., Agile or Design Thinking) to optimize large-scale sustainability projects.

ATTITUDES & BEHAVIOURS

- Demonstrate a leadership mindset by championing a culture of continuous collaborative learning and innovation within the organization.
- Resilience and adaptability when navigating systemic barriers or resistance to digital and green transformations.

Suggested Self-Directed Learning Activities

SKILLS

- Conduct a stakeholder mapping exercise for a local business, identifying key players and using a digital tool (like Miro or Trello) to draft a collaborative communication plan for a specific green initiative.

KNOWLEDGE

- Complete an online micro-credential or case study analysis focused on the "Twin Transition," specifically examining how successful organizations integrate digital data tracking with circular economy principles.

ATTITUDES & BEHAVIOURS

- Practice active listening and perspective-taking by interviewing two professionals from different sectors (e.g., a technical engineer and a sustainability officer) to document and reflect on how their conflicting priorities can be reconciled.

Examples of Relevant Programs, Initiatives, or Projects to learn in Groups

SKILLS



Participate in an Erasmus+ "Cooperation Partnership" (e.g., GreenVET or eGreen) where groups of learners and teachers from different countries co-create digital gamified platforms or training kits to help local SMEs reduce their carbon footprint through industrial maintenance and repair.



Participate in a Green Hackathon or Innovation Challenge where groups must use digital prototyping tools to co-design a circular economy solution for a local industry partner.

KNOWLEDGE



Engage with a Sector Skills Council (SSC) Initiative, where groups analyze regional labor market data to recommend curriculum updates that align vocational training with specific green and digital requirements of local industries (e.g., Waste Recovery or Automotive sectors).



Join a Sustainability Community of Practice (CoP) or a structured peer-learning circle focused on analyzing the EU Digital Product Passport (DPP) to understand its impact on cross-sectoral supply chain transparency.

ATTITUDES & BEHAVIOURS



Join a "Greeners VET" Workshop or Campus Green Team, where cross-disciplinary groups (students, facility managers, and local businesses) use tools like the #GreenerVetChecklist to negotiate and implement sustainable waste management and energy-saving protocols for their training centers.



Engage in Role-Play Stakeholder Simulations (such as the Climate Action Simulation) to navigate conflicting priorities and build empathy for diverse economic and environmental perspectives.

Competence 7 – Fostering Sustainable Entrepreneurship and Innovation

DIMENSION OF THE KEY COMPETENCE AREA: Fostering Sustainable Entrepreneurship and Innovation

The transition to a green and circular economy depends on people who can turn sustainability problems into viable solutions, yet learners are rarely equipped to move from a good idea to a tested, credible venture. Entrepreneurial capability – spotting opportunities, designing sustainable business models, validating them with users and measuring their impact – is a decisive competence for the green economy, and one that VET is well placed to build but often does not address explicitly. The EntreComp framework (Bacigalupo, Kampylis, Punie and Van den Brande, 2016) provides the European reference for entrepreneurship as a competence, and the Circular Economy Action Plan (COM(2020) 98) sets the economic context in which green and circular innovation is increasingly expected. This competence area supports learners to recognise opportunities, ideate and prototype, design and validate sustainable and circular business models, and communicate their impact honestly rather than through greenwashing. For institutions it links education to regional innovation and job creation; for educators it provides a structured pathway from ideation to implementation; and for learners it builds the confidence and capability to design, test and launch green and circular solutions – whether as founders, as intrapreneurs within existing organisations, or as engaged professionals who can drive sustainable innovation from within.

ATTRIBUTES OF THE KEY COMPETENCE AREA: Fostering Sustainable Entrepreneurship and Innovation

Importance for Integrated Sustainability for Green, Digital and Economic Transformations in VET: The transition is also an economic opportunity, and VET learners hold the practical skills to seize it. This competence enables educators to support learners in designing, testing and implementing green and circular solutions – from workplace improvements to viable ventures. It links environmental purpose with economic value creation and builds the entrepreneurial confidence that a changing labour market rewards.

For institutional leaders: it helps leaders position the VET institution as an active player in regional sustainable innovation ecosystem, build partnerships with the ecosystem stakeholders, support strategic differentiation turning sustainability challenges into initiatives.

For educators/ trainers: equips to facilitate entrepreneurship-oriented learning guiding learners through opportunity recognition, prototyping, whole embedding sustainability principles.

For students: empowers to transform sustainability problems into innovative solutions, builds confidence, initiative, employability.

Basic level

SKILLS

- Recognise simple sustainability-related needs/problems that could become business or project ideas.
- Contribute to idea generation (brainstorming) for greener products, services, or organisation improvements
- Formulate and describe the idea of improvements for sustainable entrepreneurship

KNOWLEDGE

- Basic understanding of "sustainable entrepreneurship" and what makes it different
- Awareness of simple sustainability concepts relevant to innovation (circularity, energy efficiency, waste prevention).
- Understands the basic steps of turning an idea into a small project (goal, activities, resources, simple timeline).

ATTITUDES & BEHAVIOURS

- Shows curiosity about sustainable solutions and willingness to test new ideas
- Demonstrates openness to teamwork and accepts guidance and feedback during group ideation.
- Acts responsibly in small tasks and follows agreed basic sustainability rules within the organisation (e.g., reduce waste in activities).

Intermediate level

SKILLS

- Identify and validate opportunities by combining sustainability needs with user/customer insights
- Develop a sustainable value proposition and outline how value is created from social, environmental and economic aspects
- Prototype and test a solution concept on improvements for sustainable entrepreneurship

KNOWLEDGE

- Understands sustainable business model basics (value proposition, customers/users, resources, costs, revenues, partners)
- Knowledge of common innovation approaches and IP, ethical considerations
- Understands basic impact measurement concepts

ATTITUDES & BEHAVIOURS

- Takes initiative in teamwork and helps organise tasks to move an idea for testing and implementation
- Considers inclusion, safety, and environmental impacts when making choices
- Demonstrates perseverance and learning-from-failure; uses feedback to improve the concept

Advanced level

SKILLS

- Lead a sustainable innovation project from opportunity framing to pilot implementation, including partners, resources, and risks
- Design a scalable sustainable business model and align it with the relevant policies, standards and market specifics
- Set impact targets and KPIs, evaluate results, and adapt strategy to maximise positive outcomes

KNOWLEDGE

- Deep knowledge of sustainable business models (e.g. circular economy models, sharing models, servitisation).
- Understands innovation ecosystems and how to build partnerships
- Knowledge of advanced impact and risk approaches

ATTITUDES & BEHAVIOURS

- Leads sustainable entrepreneurship and motivates others to pursue responsible innovation
- Demonstrates ethical leadership and long-term planning
- Acts as a change agent by building coalitions and influencing decisions

Suggested Self-Directed Learning Activities

SKILLS	KNOWLEDGE	ATTITUDES & BEHAVIOURS
- Reformulate sustainability problems you see in daily activity of the organisation in opportunity statements - Collect responses of the stakeholders to summarise needs, constraints, and willingness to adopt a solution - Proceed prototyping and analyse it - Build a one-page business model for a circular or low-carbon idea and revise it - Define simple impact indicators (e.g., kg waste avoided, kWh saved, users reached) and track them for certain time of the idea piloting	- Study the basics of sustainable business and entrepreneurship (triple bottom line, circular economy, social enterprise models). - Learn innovation methods and develop research questions, hypothesis for sustainable business improvement for R&D and testing - Explore funding and support mechanisms - Proceed risk and impact measurement - Analyse real sustainable start-ups and identify what made them viable	- Be the one of those who test the proposed ideas - Practise reflective learning considering the changes before, during and after the testing of the idea - Set personal ethics guidelines for the project - Practise resilience: list failures/risks you expect and how you will respond - Proceed network building and ask the stakeholders on the idea and project implementation - Share learning openly: present your idea and evidence to peers and invite critique to improve quality and credibility

Examples of Relevant Programs, Initiatives, or Projects to learn in Groups

SKILLS

- 
Turning climate challenge idea into entrepreneurial opportunity
"Climate Launchpad" competition
 [Link](#)
- 
Proceed group webinars, hackathons using the resources from Climate KIC
 [Link](#)
- 
Explore case studies from the UNDP Accelerator Labs from
 [Link](#)

- Within the group train by developing a proposal using the EU funding opportunities  [Link](#)

KNOWLEDGE

- Explore the EntrComp framework for understanding the competences to achieve set goals  [Link](#)
- Study the EU GreenComp competences to connect sustainability to entrepreneurial ideas and projects  [Link](#)
- Review the macroeconomic environment and policies for entrepreneurship in OECD reports  [Link](#)

ATTITUDES & BEHAVIOURS

- Check sustainability claims using responsible communication guidance  [Link](#)
- Explore and join the Innovation Entrepreneurship Education challenges and opportunities  [Link](#)

A bibliometric analysis of SMEs found that investment in innovation, digitalization, and sustainability together affects company growth – but interestingly, a firm's youth (i.e., how new it is) affects its sustainability outcomes specifically, without similarly affecting its innovation and digitalization dynamics. – **ScienceDirect**



Competence 8 – Ethical, Responsible, and Reflective Sustainability Mindset

DIMENSION OF THE KEY COMPETENCE AREA: Ethical, Responsible, and Reflective Sustainability Mindset

Sustainability is fundamentally a matter of values, and without an ethical and reflective foundation even well-resourced initiatives risk becoming box-ticking exercises or, worse, greenwashing. Learners and institutions can acquire the technical vocabulary of sustainability while leaving their assumptions, choices and everyday behaviours unexamined – a gap that undermines credibility and long-term commitment. GreenComp (Bianchi, Pisiotis and Cabrera Giraldez, 2022) places embodying sustainability values – valuing sustainability, supporting fairness, and promoting nature – at the very foundation of its competence framework, signalling that mindset and integrity are not soft extras but the ground on which every other competence rests. This competence area develops the capacity to act with integrity, to model sustainable behaviours, and to reflect critically on attitudes, decisions and professional practice, including consideration of intergenerational and social justice. For institutions it protects the authenticity and reputation of their sustainability work; for educators it provides a basis for modelling the behaviours they teach and for supporting learners' ethical reasoning; and for learners it cultivates the responsibility, honesty and reflective self-awareness that turn sustainability from a subject studied into a way of working and living.

ATTRIBUTES OF THE KEY COMPETENCE AREA: Leading Sustainable Transformation

Importance for Integrated Sustainability for Green, Digital and Economic Transformations in VET: Transformation without integrity does not last. This competence anchors sustainability in values: acting honestly, modelling sustainable behaviour, and reflecting critically on choices and professional practice. It protects institutions from greenwashing, lends credibility to every claim they make, and ensures the green, digital and economic transition is carried by genuine conviction rather than by compliance alone.

Basic level

SKILLS

- Identify ethical dilemmas related to sustainability in their daily work.
- Follow established codes of conduct regarding responsible resource use.

KNOWLEDGE

- Understand basic ethical principles and the concept of professional responsibility.
- Awareness of how individual choices impact the environment.

ATTITUDES & BEHAVIOURS

- Willingness to reflect on personal habits.
- Respect for institutional sustainability values.

Intermediate level

SKILLS

- Critically evaluate professional practices against sustainability ethics.
- Consistently model sustainable behaviours for students and colleagues.

KNOWLEDGE

- Knowledge of ethical frameworks and corporate social responsibility (CSR).
- Understanding the interconnectedness of social, economic, and environmental justice.

ATTITUDES & BEHAVIOURS

- Commitment to acting with integrity even when it is difficult.
- Cultivating a reflective practice habit.

Advanced level

SKILLS

- Lead institutional discussions on ethical challenges in green and digital transitions.
- Foster a culture of critical reflection and accountability across the organization.

KNOWLEDGE

- Deep knowledge of environmental ethics, digital ethics (AI), and global sustainability philosophy.
- Understanding of systems thinking and long-term ethical consequences.

ATTITUDES & BEHAVIOURS

- Embodying a "sustainability-first" mindset in all professional decisions.
- Inspiring others through authentic and responsible leadership.

Suggested Self-Directed Learning Activities

SKILLS	KNOWLEDGE	ATTITUDES & BEHAVIOURS
Maintain a weekly reflective journal focused on ethical dilemmas encountered at work.	Study "Human-First AI" ethical guidelines to understand the impact of digital transformation.	Participate in "Ethical Leadership" webinars or MOOCs.

Examples of Relevant Programs, Initiatives, or Projects to learn in Groups

SKILLS

- The UN Global Compact (principles on human rights, labor, and environment).

KNOWLEDGE

- EU Corporate Sustainability Due Diligence Directive (CSDDD).

ATTITUDES & BEHAVIOURS

- Local community ethics boards or Climate Pact ambassador networks.

Competence 9 – Resources Management Optimisation

DIMENSION OF THE KEY COMPETENCE AREA:

Resources Management Optimisation

A whole-institution approach to sustainability requires institutions to manage their own operations sustainably, yet the efficient use of energy, materials, time, infrastructure and digital resources is frequently overlooked in favour of curriculum-focused initiatives alone. VET providers consume significant resources, and how they manage them is both a direct contribution to the green transition and a visible, credible lesson for learners. The Council Recommendation of 16 June 2022 explicitly includes the management of buildings and resources within a whole-institution approach and calls for investment in green and sustainable equipment and infrastructure, while the Circular Economy Action Plan (COM(2020) 98) frames resource efficiency as an economic as well as an environmental priority. This competence area builds the capacity to manage institutional, financial, physical and environmental resources efficiently and responsibly – reducing waste, improving energy and material use, and applying circular principles across an institution's operations. For leaders it aligns operational decisions with sustainability strategy and often with cost savings; for educators it makes the institution itself a teaching resource that demonstrates sustainability in practice; and for learners it develops the resource-conscious habits and analytical skills that responsible professional practice in any sector now requires.

ATTRIBUTES OF THE KEY COMPETENCE AREA:

Resources Management Optimisation

Importance for Integrated Sustainability for Green, Digital and Economic Transformations in VET: An institution teaches through the way it operates. This competence enables the efficient, sustainable management of institutional, financial, physical and environmental resources – energy, materials, budgets and facilities – so that the campus itself demonstrates the practices learners are taught. It cuts costs and footprint together, and turns everyday operations into a living laboratory for the twin transition.

Basic level

SKILLS

- Identify obvious sources of waste, overuse or inefficiency in classrooms, workshops or routine processes.
- Follow simple rules for saving materials, energy and time.

KNOWLEDGE

- Know basic concepts of resource efficiency, waste reduction, circular economy and responsible consumption.
- Understand that materials, energy, water, equipment and time are institutional resources that should be managed carefully.

ATTITUDES & BEHAVIOURS

- Show care for shared resources and learning environments.
- Is available to reduce unnecessary consumption and follow agreed procedures.
- Demonstrate openness to habits that support efficiency, order and sustainability.

Intermediate level

SKILLS

- Analyse workflows and identify avoidable losses in materials, energy, time or equipment use.
- Apply basic optimisation methods to improve resource use in labs, workshops, offices or learning activities.

KNOWLEDGE

- Know common methods for monitoring usage, setting simple indicators and comparing alternative solutions.
- Understand principles of preventive maintenance, reuse, repair and circular practices relevant to the vocational field.

ATTITUDES & BEHAVIOURS

- Take responsibility for improving the efficient use of resources.
- Demonstrate a proactive and problem-solving attitude toward waste and inefficiency.

Advanced level

SKILLS

- Design and lead resource optimisation strategies
- Balance environmental, economic and operational criteria when making decisions.
- Coordinate stakeholders to embed circularity, efficiency and responsible procurement into practice.

KNOWLEDGE

- Have advanced knowledge of resource-efficiency strategies, circular economy approaches and process-improvement methods.
- Understand how institutional planning, infrastructure use and learning design affect sustainability outcomes.

ATTITUDES & BEHAVIOURS

- Act as a change agent for efficient and responsible resource use.
- Demonstrate long-term, systemic and improvement-oriented thinking.
- Promote accountability, and continuous review in relation to shared resources.

Suggested Self-Directed Learning Activities

SKILLS

- Carry out a mini-audit of energy, materials, water or time use in a classroom, workshop or office process.
- Study European examples on green VET, circular economy and resource efficiency.
- Keep a reflective journal on how everyday decisions affect resource use and sustainability.

Examples of Relevant Programs, Initiatives, or Projects to learn in Groups

SKILLS

- [GreenComp – European sustainability competence framework \(European Commission / JRC\)](#)
- [CEDEFOP resources on integrating the green transition and sustainability in VET curricula](#)

Competence 10 – Forecasting Sustainability Changes and Challenges

DIMENSION OF THE KEY COMPETENCE AREA: Forecasting Sustainability Changes and Challenges

Sustainability operates in a fast-moving landscape of shifting regulation, emerging technologies and changing labour-market demands, and institutions that only react are perpetually behind. The capacity to anticipate – to read weak signals, foresee risks and opportunities, and prepare accordingly – is therefore essential, yet foresight and futures thinking remain among the least developed capabilities in VET. GreenComp (Bianchi, Pisiotis and Cabrera Giraldez, 2022) identifies envisioning sustainable futures, including futures literacy and anticipation, as a core sustainability competence, and CEDEFOP's long-standing work on skills forecasting and anticipation demonstrates both the value and the methods of looking systematically ahead. This competence area develops the ability to monitor sustainability trends across the green, digital and economic domains, to interpret their implications for an institution and its sectors, and to use that insight to guide strategic decision-making. For leaders it turns planning from reactive to proactive and strengthens institutional resilience; for educators it keeps curricula aligned with skills that are emerging rather than only those that already exist; and for learners it builds the adaptive, forward-looking mindset needed to remain employable and effective as the sustainability landscape continues to change.

ATTRIBUTES OF THE KEY COMPETENCE AREA: Forecasting Sustainability Changes and Challenges

Importance for Integrated Sustainability for Green, Digital and Economic Transformations in VET: The transition is a moving target: technologies, regulations and labour-market demands keep shifting. This competence enables institutions to anticipate emerging sustainability trends, risks and opportunities, and to feed that foresight into strategy, curricula and partnerships. It works as an early-warning system, keeping programmes relevant and ensuring today's decisions prepare learners for tomorrow's economy.

Basic level

SKILLS

- Identify obvious sustainability trends and environmental regulations currently affecting their specific trade or local industry.
- Use basic online tools and news sources to find information about upcoming changes in green or digital standards.

KNOWLEDGE

- Recognize the difference between short-term market fluctuations and long-term sustainability shifts (e.g., the move away from single-use plastics).
- Identify the primary sources of reliable information regarding future environmental and digital requirements in their sector.

ATTITUDES & BEHAVIOURS

- Openness to the idea that professional roles and industry requirements will change due to environmental factors.
- Willingness to stay curious about how new technologies might impact their daily work tasks in the future.

Intermediate level

SKILLS

- Monitor and interpret industry-specific data to identify emerging sustainability challenges that could affect work processes.
- Contribute to "what-if" scenario planning exercises to help a team prepare for potential shifts in green regulations or digital requirements.

KNOWLEDGE

- Explain the lifecycle of a trend and how technological advancements (Digital) often accelerate sustainability requirements (Green).
- Understand common forecasting methods, such as SWOT or PESTLE analysis, as they apply to environmental and economic sustainability

ATTITUDES & BEHAVIOURS

- Proactive mindset in seeking out information about future industry disruptions rather than waiting for instructions.
- Commitment to adaptability, showing a readiness to adjust personal work habits in response to predicted sustainability challenges.

Advanced level

SKILLS

- Develop comprehensive sustainability roadmaps that integrate long-term environmental projections with digital infrastructure and economic viability.
- Synthesize complex data from diverse sources to predict systemic risks and identify "weak signals" of future industry disruptions before they become mainstream.

KNOWLEDGE

- Evaluate sophisticated forecasting methodologies, such as backcasting or horizon scanning, to guide organizational strategy in a VUCA environment.
- Understand the global interdependencies of the "Twin Transition," including how geopolitical shifts and resource scarcity impact local economic sustainability.

ATTITUDES & BEHAVIOURS

- Champion a "future-ready" culture by encouraging others to embrace uncertainty as an opportunity for innovation rather than a threat.
- Demonstrate ethical leadership by prioritizing long-term regenerative goals over short-term financial gains when forecasting future paths.

Suggested Self-Directed Learning Activities

SKILLS

- Conduct a Horizon Scanning exercise where you select one specific tool or material used in your trade and research how it is predicted to change over the next 5–10 years due to environmental regulations.

KNOWLEDGE

- Analyze a Sustainability Megatrend Report (such as those from the EEA or OECD) and map out how a specific global trend, like "Demographic Shifts" or "Decarbonization," will directly impact the economic stability of your local industry.

ATTITUDES & BEHAVIOURS

- Maintain a "Future-Journal" for one month, where you document news articles or industry shifts that surprised you, reflecting on how you can shift your mindset from resisting these changes to seeing them as opportunities for growth.

Examples of Relevant Programs, Initiatives, or Projects to learn in Groups

SKILLS

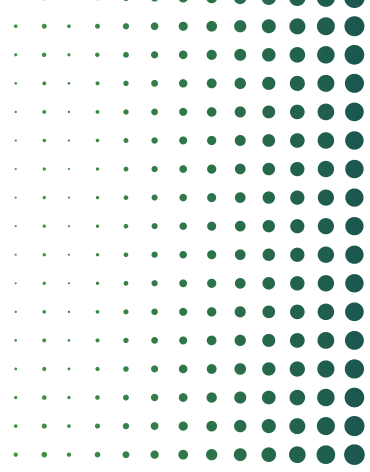
- **Industry workshops:** Learners in groups identify a desired sustainable future state for their specific industry (e.g., a carbon-neutral construction site) and work backward to map out the specific technical and digital milestones required to get there.
- **Collaborative dashboards:** Small teams use shared digital tools (like Padlet or Miro) to curate a real-time "Signals of Change" board, where they must collectively categorize and present how emerging global news will impact their local vocational sector.

KNOWLEDGE

- **Industry workshops:** Learners in groups identify a desired sustainable future state for their specific industry (e.g., a carbon-neutral construction site) and work backward to map out the specific technical and digital milestones required to get there.
- **Risk assessment projects:** Teams conduct a PESTLE analysis (Political, Economic, Social, Technological, Legal, Environmental) on a local business case study to identify which future sustainability challenges pose the greatest threat to its current economic model.

ATTITUDES & BEHAVIOURS

- **Future scenario role-playing:** Groups are assigned different "Future Scenarios" (from "Optimistic Green Growth" to "Resource Scarcity") and must role-play how they would adapt their professional identities and business strategies to thrive in those environments.
- **Discussion circles:** In this exercise, groups present their future industry forecasts while a rotating "Challenger" group is tasked with identifying overlooked blind spots or "Greenwashing" traps. This initiative fosters an attitude of critical humility and intellectual rigor, training learners to value skepticism and diverse viewpoints as essential tools for accurate forecasting rather than personal criticism.



Part III –

The 10-Step Process Model for Implementing and Integrating Sustainability in VET





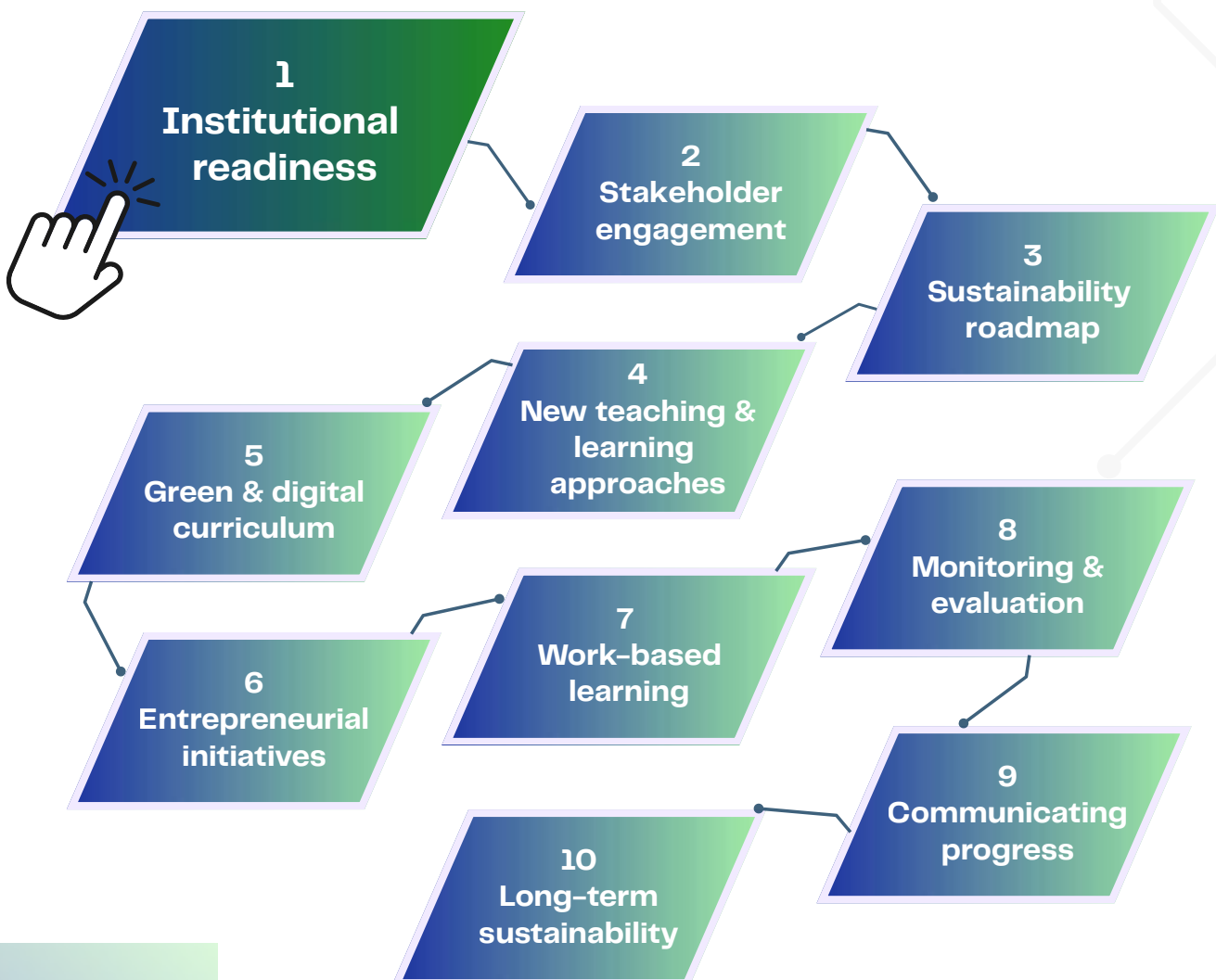
STEP 1 - Institutional readiness

1. Purpose of this guide

Assessing institutional readiness is the first step of the X-VET 10-Step Process Model, and everything that follows depends on it. Before an institution can engage stakeholders, define a roadmap or redesign its curriculum, it needs an honest answer to a simple question: where do we actually stand today? This guide turns that question into a structured, manageable exercise.

It is written for the people who will run the assessment – institutional leaders, sustainability coordinators and quality managers in VET – and for the colleagues and learners who take part in it. It explains why the readiness assessment matters, what it covers, and how to conduct it in five phases over four to six weeks, and it provides three ready-to-use tools: a self-assessment matrix (Tool A), a SWOT-PESTLE context canvas (Tool B), and a baseline report and action planner (Tool C). The maturity levels used throughout correspond broadly to the Basic – Intermediate – Advanced progression of the competence tables in Part Three of the Workbook, so the two documents can be used side by side.

2. Step 1 within the 10-Step Process Model





Step 1 converts a leadership decision — “we want to take sustainability seriously” — into a shared, evidence-based picture of the institution’s starting point. Its output, the Readiness Baseline Report, travels forward through the model: the stakeholders identified during the assessment become the long-list for Step 2 (engagement); the baseline scores and priority gaps become the reference point and first KPIs for the Step 3 roadmap; and the evidence gaps discovered along the way inform the design of the Step 8 monitoring framework. Skipping or rushing this step is the most common reason sustainability strategies later prove symbolic: targets get set without baselines, and actions without evidence.

How Step 1 draws on the competence framework?

The assessment is an exercise in Competence 2 (structured context analysis and evidence-based diagnosis). It needs the mandate and sponsorship of Competence 1, borrows its evidence discipline from Competence 3, and — in the validation phase — previews the stakeholder engagement of Competence 6.

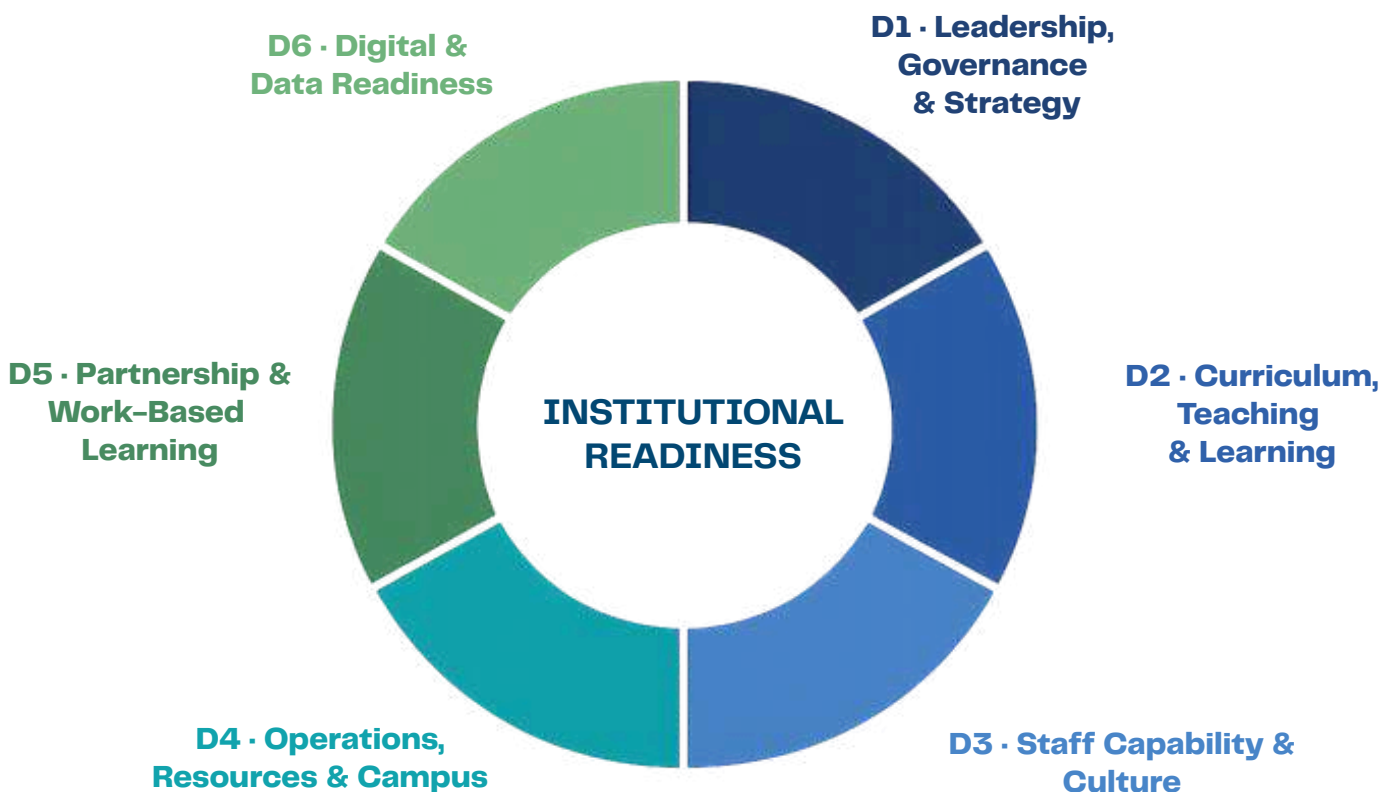
3. Why readiness comes first

European policy is explicit that sustainability in education is a whole-institution matter. The Council Recommendation of 16 June 2022 on learning for the green transition and sustainable development asks providers to embed sustainability not only in teaching and learning but in vision, planning and governance, the management of buildings and resources, and partnerships with the community. An institution cannot act on all of that at once — and should not try to — without first knowing which of those areas are strong, which are weak, and which offer quick wins. GreenComp (Bianchi, Pisiotis and Cabrera Giraldez, 2022) makes the same point at the level of people: sustainability capability is built deliberately, and deliberate building starts from a diagnosis.

There are also thoroughly practical reasons. A readiness assessment creates a shared language and a common set of facts before opinions harden; it surfaces the champions, data sources and partnerships the institution already has; it protects against greenwashing by demanding evidence for every claim; and it produces exactly the baseline material that funding programmes such as Erasmus+ expect to see behind a credible sustainability work plan.

4. The six dimensions of institutional readiness

The assessment looks at the institution through six dimensions, together covering the whole-institution approach. They structure the self-assessment matrix (Tool A), the baseline report (Tool C) and, later, the roadmap.



D1 · Leadership, Governance & Strategy.

Whether sustainability is anchored in mission and strategy, who is accountable for it, whether it has resources, and how far it genuinely shapes management decisions.

D2 · Curriculum, Teaching & Learning.

Whether sustainability learning outcomes run across programmes rather than sitting in a single module, whether pedagogy is experiential and project-based, and whether competences — not just knowledge — are assessed.

D3 · Staff Capability & Culture.

Whether staff have access to relevant professional development, feel confident addressing sustainability in their own subjects, and whether engagement extends beyond a few champions and is recognised by the institution.

D4 · Operations, Resources & Campus.

Whether the institution monitors and manages its energy, water, waste and procurement – and whether the campus and workshops are used as a living lab that makes sustainability visible to learners.

D5 · Partnerships & Work-Based Learning.

Whether employers, local authorities and community organisations are active partners, and whether placements and work-based learning include explicit sustainability content and real challenges.

D6 · Digital & Data Readiness.

Whether digital tools support sustainability learning and monitoring, whether the data needed to track progress is actually available, and whether the footprint of the digital infrastructure itself is considered – the twin-transition dimension.

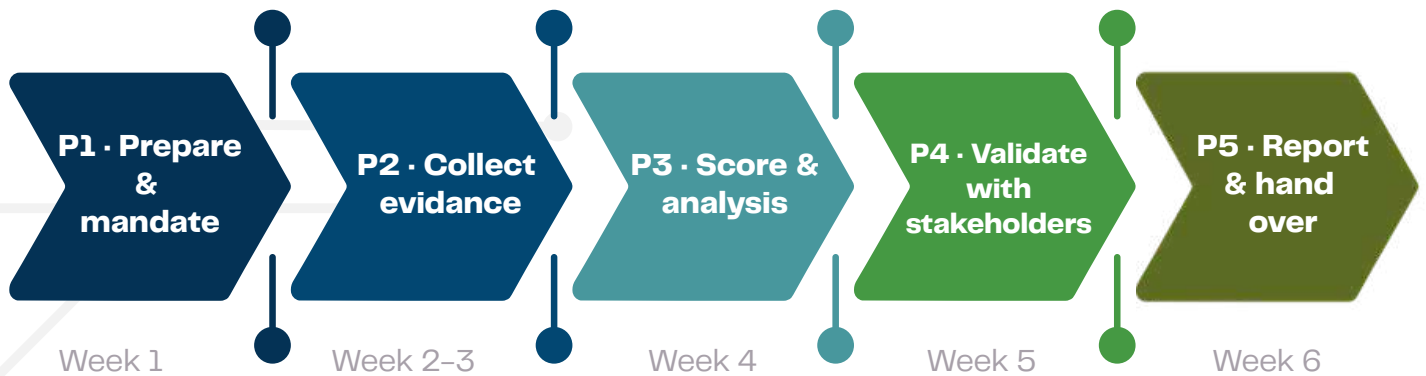
5. Readiness maturity levels

Each indicator in Tool A is scored on a four-level scale. The levels describe how deeply a practice is embedded – from isolated activity to whole-institution, data-driven practice – and they correspond broadly to the Basic, Intermediate and Advanced progression used in the competence tables of the Workbook (with Level 4 describing institutions that go beyond Advanced to influence others).



Scoring rule of thumb: a level is only reached when it can be evidenced. If the working group cannot point to a document, dataset or observable practice, the honest score is the lower one – the assessment measures reality, not aspiration.

6. Conducting the assessment: a five-phase pathway



Phase 1 - Prepare & mandate (week 1).

Secure a visible senior sponsor, appoint a coordinator, and form a small cross-functional working group – teaching staff, operations, quality assurance, and learners. Agree the scope and calendar, and communicate the purpose to the whole institution: this is a self-assessment to enable improvement, not an audit to apportion blame.

Phase 2 - Collect evidence (weeks 2–3).

Gather what already exists before creating anything new: strategy and policy documents, curricula and module specifications, CPD records, energy and procurement data, partnership agreements. Add a short staff–learner pulse survey, a handful of interviews, and a structured campus walk-through. Tool B (SWOT–PESTLE) is completed in this phase to capture the external context.

Phase 3 - Score & analyse (week 4).

Members of the working group first score Tool A individually, then meet to moderate: comparing scores, examining the evidence, and agreeing a consensus value for each indicator. Treat disagreement as information – a wide spread between raters usually marks exactly the areas where practice is uneven or invisible.

Phase 4 - Validate with stakeholders (week 5).

Present the provisional profile to a wider circle – staff, learner representatives, and one or two external partners – and invite challenge. This corrects blind spots, builds ownership of the results, and doubles as the soft launch of Step 2 stakeholder engagement.

Phase 5 - Report & hand over (week 6).

Consolidate everything into Tool C: the dimension profile, key strengths, priority gaps and first recommended actions. Have leadership approve it, publish a summary internally, and hand the report – with named owners – to the team preparing Steps 2 and 3.

Practical tips.

Keep it proportionate – a 60-learner provider needs a lighter exercise than a 6,000-learner college. Triangulate: no score should rest on a single voice or document. Involve learners as assessors, not just respondents. Prefer honesty over image – a low, true baseline is far more useful than a flattering one. And book the validation workshop on day one; diaries are the most common cause of delay.

Tool A

Institutional Sustainability Readiness Self Assessment Matrix

Purpose

Tool A is the core scoring instrument of Step 1. It gives an institution a structured, evidence-based snapshot of how mature its sustainability practice is, across the full breadth of institutional life — not just curriculum.

Structure:

It covers 6 dimensions, each broken into 4 indicators, for 24 indicators total:

- **D1 - Leadership, Governance & Strategy** — mission/strategy anchoring, mandate, budget, management decision-making
- **D2 - Curriculum, Teaching & Learning** — embedded learning outcomes, experiential pedagogy, competence assessment, curriculum review against skill needs
- **D3 - Staff Capability & Culture** — CPD access, breadth of staff engagement, staff confidence, recognition
- **D4 - Operations, Resources & Campus** — monitoring of energy/water/waste, sustainable procurement, campus as a "living lab"
- **D5 - Partnerships & Work-Based Learning** — employer/community partnerships, sustainability content in placements
- **D6 - Digital & Data Readiness** — digital tools for learning/monitoring, data availability, digital footprint (twin-transition angle)

Scoring key:

1	Emerging – isolated, ad-hoc, champion-driven	2	Developing – pockets of practice, not systematic
3	Established – embedded, consistent, monitored	4	Leading – whole-institution, data-driven, influencing others

Scores of 3 or 4 must be backed by documented evidence — the rule of thumb is "no evidence, no high score," since the tool is meant to measure reality rather than aspiration.

Process

Working group members first score individually, then **moderate to a consensus score** per indicator, recording supporting evidence. The four indicator scores in each dimension are then averaged to produce a **dimension average**, which feeds directly into Tool C (the consolidated baseline report).

Ref	Indicator	Score (1–4)	Evidence / notes
D1 · Leadership, Governance & Strategy			
1.1	Sustainability is explicitly anchored in the institution's mission, strategy or development plan.		
1.2	A named person or team holds a clear mandate – with allocated time – for sustainability.		
1.3	Sustainability has a dedicated budget line or systematic access to internal and external funding.		
1.4	Management decisions routinely weigh green, digital and economic sustainability impacts.		
<i>Dimension average (D1) – carry to Tool C</i>			
D2 · Curriculum, Teaching & Learning			
2.1	Sustainability learning outcomes are embedded across programmes, not confined to single modules.		
2.2	Learner-centred, experiential and project-based methods are used to teach sustainability.		
2.3	Sustainability competences are assessed – not only knowledge recall.		
2.4	Curricula are reviewed against the emerging green and digital skill needs of the sectors served.		
<i>Dimension average (D2) – carry to Tool C</i>			
D3 · Staff Capability & Culture			
3.1	Staff have access to professional development on sustainability and the related pedagogy.		
3.2	A broad base of staff – beyond a few champions – actively contributes to sustainability work.		
3.3	Staff feel confident addressing sustainability within their own subject or trade area.		
3.4	Engagement with sustainability is recognised and valued (appraisal, workload, awards).		
<i>Dimension average (D3) – carry to Tool C</i>			

Ref	Indicator	Score (1–4)	Evidence / notes
D4 · Operations, Resources & Campus			
4.1	The institution monitors its energy, water, waste and material flows.		
4.2	Procurement applies environmental and social criteria.		
4.3	The campus and workshops are used as a living lab for sustainability learning.		
4.4	A plan with targets exists to reduce the institution's environmental footprint.		
<i>Dimension average (D4) – carry to Tool C</i>			
D5 · Partnerships & Work-Based Learning			
5.1	Active partnerships with employers and community organisations address sustainability.		
5.2	Work-based learning placements include explicit sustainability content or tasks.		
5.3	Learners engage with real sustainability challenges brought by employers or the community.		
5.4	The institution communicates its sustainability work to external stakeholders.		
<i>Dimension average (D5) – carry to Tool C</i>			
D6 · Digital & Data Readiness			
6.1	Digital tools (simulations, data platforms, VLE content) support sustainability learning.		
6.2	The data needed to monitor sustainability performance is available and accessible.		
6.3	Staff and learners have the digital competences to use these tools effectively.		
6.4	The environmental footprint of the institution's own digital infrastructure is considered.		
<i>Dimension average (D6) – carry to Tool C</i>			

Tool B

Sustainability Context Canvas (PESTLE + SWOT)



How to use.

Complete during Phase 2, before scoring. The PESTLE scan captures the external forces acting on the institution; the SWOT then condenses everything – external scan plus internal evidence – into the strategic picture that frames the baseline report. Write in bullet form; two or three sharp entries per box beat ten vague ones.

B.1 PESTLE scan – the external environment

Factor	Guiding questions	Findings for our
Political	<i>EU, national and regional policy direction; funding programmes; institutional autonomy.</i>	
Economic	<i>Labour-market demand for green skills; sector transitions; cost pressures; funding cycles.</i>	
Social	<i>Learner and community expectations; demographics; employer culture; public</i>	
Technological	<i>Digital and AI tools available; sector technologies changing job profiles;</i>	
Legal	<i>Environmental regulation affecting the institution and its sectors; reporting duties;</i>	
Environmental	<i>Local climate risks; resource constraints; regional environmental priorities and</i>	

B.2 SWOT – the strategic picture

Strengths (internal · helpful)

What do we already do well? Which assets, people and partnerships can we build on?

Weaknesses (internal · hindering)

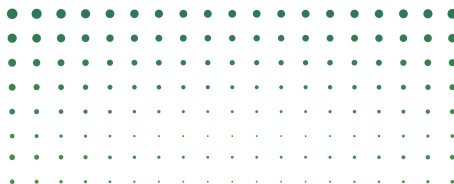
Where is practice missing, uneven or invisible? What did low indicator scores reveal?

Opportunities (external · helpful)

Which policies, funds, technologies or partners could accelerate us in the next 1–3 years?

Threats (external · hindering)

Which external changes could set us back – and which risks grow if we do nothing?



Tool C

Readiness Baseline Report & Action Planner



How to use.

Complete in Phase 5. Part C.1 consolidates the moderated results of Tool A into the institution's readiness profile; Part C.2 turns the top priority gaps into first actions with owners and timelines. Together the two pages are the Readiness Baseline Report – the formal output of Step 1 and the direct input to Steps 2 and 3.

C.1 Readiness profile summary

Dimension	Avg score	Maturity level	Key strengths	Priority gaps
D1 · Leadership, Governance & Strategy				
D2 · Curriculum, Teaching & Learning				
D3 · Staff Capability & Culture				
D4 · Operations, Resources & Campus				
D5 · Partnerships & Work-Based Learning				
D6 · Digital & Data Readiness				
OVERALL (mean of D1–D6)			Overall readiness statement (2–3 sentences):	

C.2 Priority action planner

Priority gap	First action	Owner	Timeline	Resources needed	Feeds into
					Step 2 / Step 3
					Step 2 / Step 3
					Step 2 / Step 3
					Step 2 / Step 3
					Step 2 / Step 3

7. Interpreting your results

Read the profile, not just the overall average. A flat 2.4 across all six dimensions and a profile that mixes a 3.5 in operations with a 1.3 in curriculum both average out similarly — but they call for entirely different roadmaps. The bands below give the headline reading; the shape of the profile gives the strategy.

Band	Overall avg	What it typically means	Recommended focus
Emerging	1.0 – 1.7	Sustainability depends on individual goodwill; little structure or evidence.	Secure mandate and quick wins; make existing activity visible; build the case.
Developing	1.8 – 2.5	Real pockets of practice exist but are fragmented and vulnerable to staff turnover.	Connect and systematise: strategy anchor, coordination role, first common targets.
Established	2.6 – 3.3	Sustainability is embedded in strategy and consistent across most dimensions.	Deepen weakest dimensions; strengthen data and monitoring; scale partnerships.
Leading	3.4 – 4.0	Whole-institution, data-driven practice that stands up to external scrutiny.	Innovate and share: mentor peers, lead projects, influence regional policy.

Common pitfalls

- Treating the exercise as an audit — it triggers defensive scoring and hides the truth the roadmap needs.
- Letting only champions score — the result describes the champions, not the institution.
- Scoring aspiration instead of evidence — if it cannot be shown, it is not yet a 3.
- Averaging away disagreement — a split vote is a finding; record it and investigate.
- Shelving the report — a baseline that does not reach the Step 3 roadmap team was wasted effort.

8. From baseline to roadmap: feeding Steps 2 and 3

Close Step 1 with a deliberate handover, not a filing action. Three transfers matter: the stakeholder long-list assembled during evidence collection and validation goes to the Step 2 engagement team; the dimension profile, priority gaps and first actions (Tool C) become the baseline, first KPIs and candidate priorities of the Step 3 roadmap; and the list of data that proved hard to obtain goes to whoever designs the Step 8 monitoring framework – those gaps are the first thing that framework must fix. Agree a review date (typically 12 months) at handover: repeating Tool A annually turns a one-off snapshot into a trend line, and gives the institution its first genuine sustainability performance indicator.

9. Quality checklist

Before declaring Step 1 complete, confirm:



Senior management mandate secured and communicated to the whole institution



Working group includes teaching, operations and QA – and learners



Tool B context canvas completed with external input



Every score of 3 or 4 in Tool A is backed by documented evidence



Individual scoring completed before group moderation



Provisional results validated in a stakeholder session



Baseline report (Tool C) approved by leadership and shared internally



Findings handed to the Step 2-3 team with named owners and a review date



STEP 2 - Stakeholders engagement

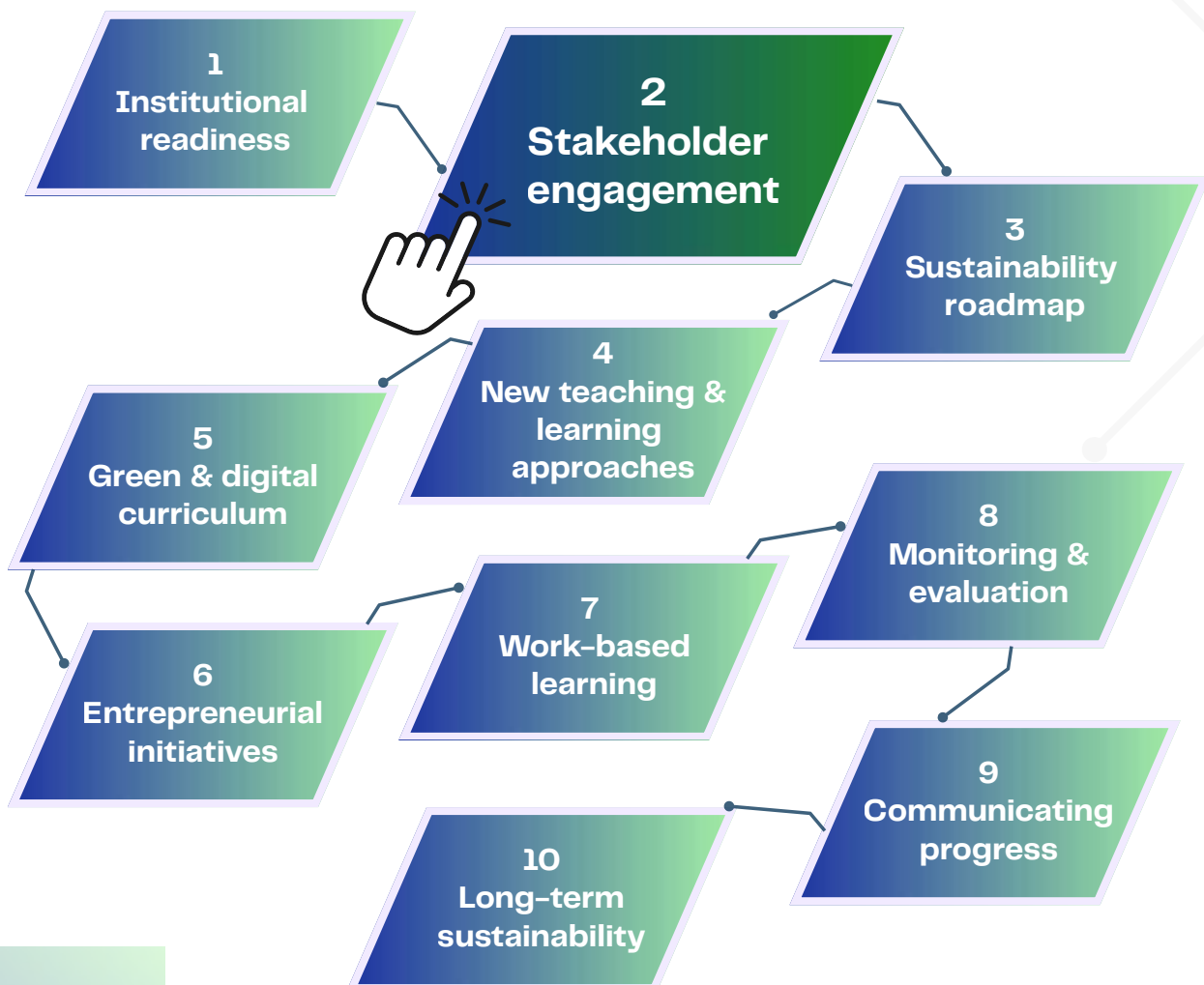
1. Purpose of this guide

Engaging stakeholders is the second step of the X-VET 10-Step Process Model. After assessing institutional readiness, VET institutions must involve the people who influence and support the sustainability transition. Effective engagement builds shared ownership, strengthens collaboration, and ensures sustainability goals reflect educational, industry, and policy needs.

This guide is intended for VET leaders, educators, students, industry partners, policymakers, and community stakeholders. It provides a practical approach for identifying, prioritizing, and engaging stakeholders over a period of 8–12 weeks, supporting participation in decision-making, curriculum development, and sustainability initiatives.

The guide includes three practical tools: Tool A: Stakeholder Mapping and Influence–Interest Matrix, Tool B: Stakeholder Engagement Strategy Canvas, and Tool C: Stakeholder Action Plan and Monitoring Tracker. Together, these tools help create **a collaborative ecosystem** that supports the institution's green and digital transition goals.

2. Step 1 within the 10-Step Process Model



Step 2 converts the institution's sustainability ambition into a shared social process. Its output — the Stakeholder Engagement Map & Commitment Profile — travels forward through the model: the actors identified in Step 1 become the engagement universe; the insights gathered during engagement shape the Step 3 roadmap; the expectations and resistance points inform Step 4 and Step 5 pedagogical and curriculum changes; the partnerships created feed Step 6 and Step 7; and the priorities voiced by stakeholders become the indicators for Step 8. Skipping or rushing this step is one of the main reasons sustainability strategies fail in implementation: actions are designed without ownership, and roadmaps without commitment.

How Step 2 draws on the competence framework?

Stakeholder engagement is an exercise in Competence 6 — mapping actors, aligning interests, and building commitment. It requires the strategic mandate of Competence 1, because participation only happens when leadership signals its importance. It relies on the evidence discipline of Competence 3, ensuring discussions are grounded in the Step 1 baseline rather than assumptions. It uses the communication skills of Competence 4 to translate sustainability into clear, motivating messages for diverse groups. And — through co-design workshops — it previews the curriculum and innovation work of Competence 7 and Competence 10, as stakeholders begin shaping ideas that later feed teaching approaches and entrepreneurial initiatives. Skipping or minimising this step weakens the model: without Competence-6-driven engagement, the roadmap lacks ownership, curriculum changes lack legitimacy, work-based learning lacks partners, and monitoring frameworks lack relevance.

3. Why stakeholder engagement matters

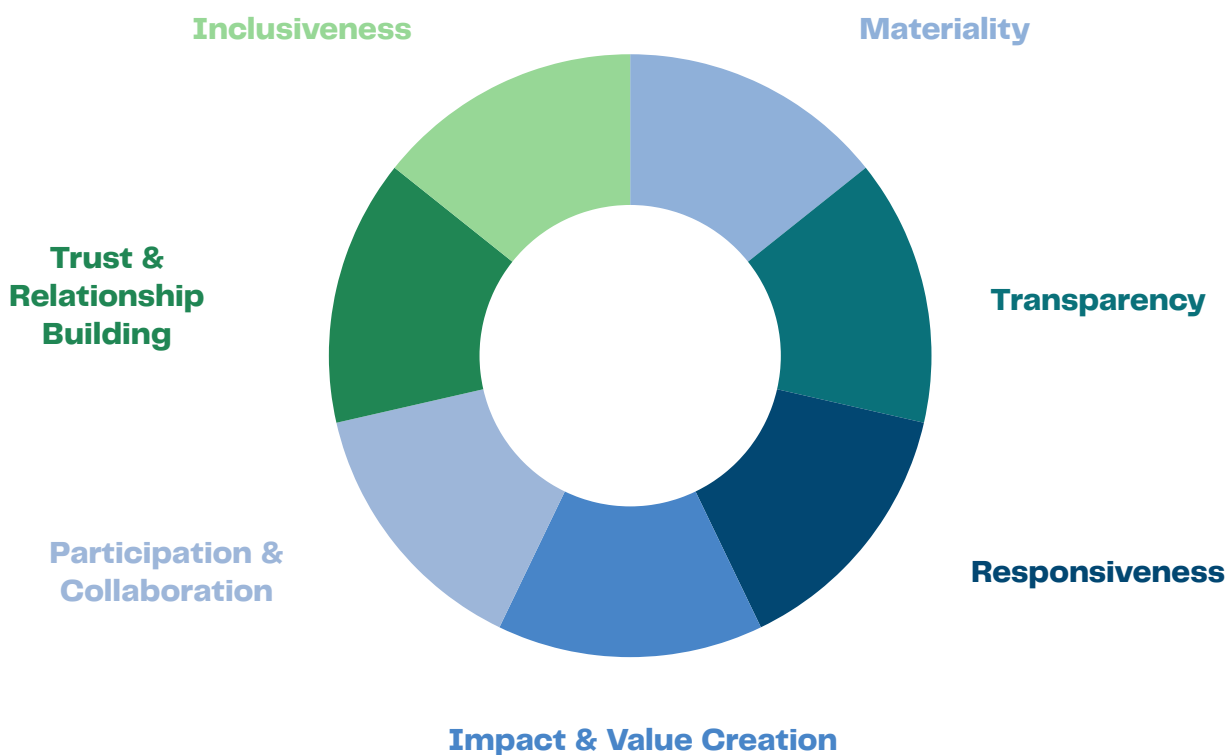
European policy is clear that sustainability in education is a collective endeavour. The Council Recommendation of 16 June 2022 emphasises that learning for the green transition must involve not only teaching and learning, but also governance, planning, resource management, campus operations and community partnerships. None of these domains can shift without the people who shape them. Stakeholder engagement is therefore essential: it activates the teachers, learners, employers, managers and community actors who together determine whether sustainability becomes embedded or remains symbolic. GreenComp (Bianchi, Pisiotis & Cabrera Giraldez, 2022) reinforces this at the individual level, noting that sustainability competences are built deliberately — and deliberate development begins with participation and shared understanding.

Without structured engagement, institutions design actions without ownership, roadmaps without legitimacy and partnerships without commitment — weakening the entire transition.

4. The seven dimensions of stakeholder engagement

When developing a stakeholder engagement framework, these dimensions are often grouped into three broad categories:

- **Structural dimensions** (power, influence, stakeholder salience)
- **Process dimensions** (communication, participation, responsiveness)
- **Relational dimensions** (trust, commitment, satisfaction, collaboration)



D1. Inclusiveness: Ensures all relevant stakeholder groups are identified and given opportunities to participate. May include employees, customers, suppliers, investors, local communities, governments, NGOs, and future generations.

D2. Materiality: Focuses engagement on sustainability issues that are most important to both stakeholders and the organization. Helps determine priorities such as climate change, human rights, resource use, or community impacts.

D3. Transparency: Involves open and honest communication about sustainability goals, performance, risks, and challenges. Builds credibility and trust.

D4. Responsiveness: Refers to how effectively an organization listens to stakeholder concerns and incorporates feedback into decisions and actions. Demonstrates accountability.

D5. Participation and Collaboration: Measures the extent to which stakeholders contribute to planning, decision-making, implementation, and evaluation. Engagement can range from consultation to co-creation of sustainability solutions.

D6. Trust and Relationship Building: Focuses on creating long-term, mutually beneficial relationships rather than one-time interactions. Trust is essential for addressing complex sustainability issues.

D7. Impact and Value Creation: Assesses whether engagement leads to improved sustainability outcomes, reduced risks, enhanced reputation, and shared value for stakeholders.

5. Stakeholder engagement levels

Stakeholder engagement in sustainability is the process of identifying, communicating with, and involving individuals or groups who affect or are affected by an organization's environmental, social, and economic activities. It is a core principle of sustainable development because organizations cannot effectively address sustainability challenges without understanding and responding to stakeholder expectations.

A widely cited model by the International Association for Public Participation (IAP2) describes engagement levels as a spectrum:

1. **Inform** – provide information.
2. **Consult** – obtain feedback.
3. **Involve** – work directly with stakeholders.
4. **Collaborate** – partner in decision-making.
5. **Empower** – place final decision-making in stakeholders' hands

In this context, **stakeholder engagement** becomes **a strategic tool** for achieving sustainability goals while balancing economic, social, and environmental interests, often referred to as the triple bottom line (People, Planet, and Profit).

6. Key benefits of stakeholder engagement in sustainability

Effective stakeholder engagement helps organizations achieve sustainability goals while creating value for both the organization and its stakeholders. Key benefits include:

Improved Decision-Making – Stakeholders provide diverse perspectives, local knowledge, and expertise that can lead to better sustainability strategies and decisions.

Enhanced Trust and Reputation – Open dialogue and transparency strengthen relationships and build credibility with customers, communities, investors, and regulators.

Identification and Management of Risks – Early engagement helps organizations identify environmental, social, and governance (ESG) risks and address potential conflicts before they escalate.

Greater Innovation and Problem-Solving – Collaboration with stakeholders can generate new ideas, technologies, and solutions to sustainability challenges.

Increased Social License to Operate – Organizations that actively engage affected communities are more likely to gain acceptance and support for their activities.

Stronger Stakeholder Commitment – Involved stakeholders are more likely to support sustainability initiatives and contribute to their success.

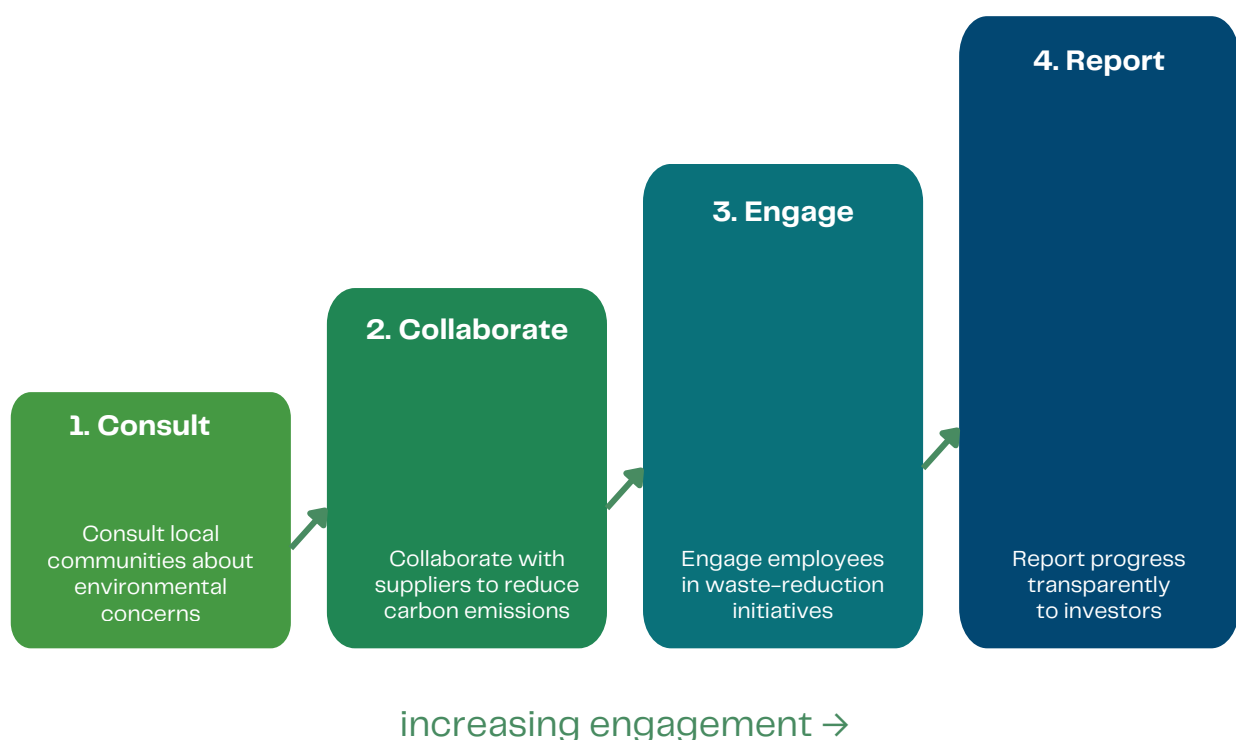
Better Understanding of Material Issues – Engagement helps organizations identify the sustainability topics that matter most to stakeholders and prioritize resources accordingly.

Improved Sustainability Performance – Stakeholder feedback can enhance environmental, social, and economic outcomes and support continuous improvement.

Regulatory and Investor Confidence – Demonstrating meaningful stakeholder engagement can improve compliance, attract responsible investment, and meet ESG reporting expectations.

7. Stakeholder engagement example

A manufacturing company seeking to reduce its environmental footprint might:



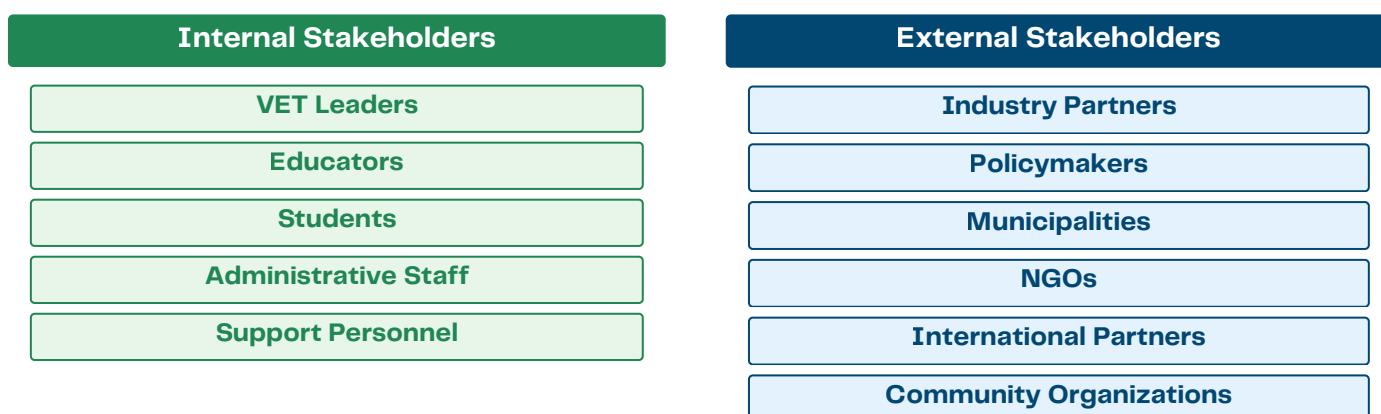
8. A structured and collaborative stakeholder engagement system

A **structured and collaborative stakeholder engagement system** that enables VET institutions to successfully plan, implement, and sustain their green and digital transition.

More specifically, by the end of this step, a VET institution should achieve:

- **Identified and mapped stakeholders** (leaders, educators, students, industry, policymakers, NGOs, and partners).
- **Prioritized stakeholder groups** using the Influence–Interest Matrix.
- **A stakeholder engagement strategy** based on transparency, inclusiveness, co-creation, and evidence-based decision-making.
- **Defined engagement processes and roles** for each stakeholder group.
- **Use of appropriate EU and international tools and frameworks** (GreenComp, DigComp, Pact for Skills, Climate Pact, CEDEFOP, UNEVOC, etc.).
- **Collaborative activities and partnerships** that support sustainability and digital transformation initiatives.
- **Monitoring and evaluation mechanisms** to measure participation, collaboration, curriculum improvements, and partnership outcomes.
- **Stronger governance, shared ownership, and institutional commitment to sustainability.**

Stakeholder Categories



Duration: Engaging Stakeholders in the Sustainability Transition

A practical duration that can change depending on the individual needs, this timeline is indicative only. Estimated completion time: 8–12 weeks to establish a comprehensive stakeholder engagement framework and launch collaborative sustainability transition activities.



Total suggested duration: 2–3 months (8–12 (+) weeks)

Tool A

Stakeholder Mapping Framework

(Influence-Interest Matrix)

Purpose

Tool A is the core stakeholder analysis instrument of Step 2. It helps VET institutions identify, prioritize, and engage stakeholders that influence or are affected by sustainability and digital transition activities, supporting stronger partnerships, shared ownership, and more effective implementation of sustainability goals.

Structure:

It covers 7 dimensions, each broken into 4 indicators, for 28 indicators total:

- **D1 · Stakeholder Identification & Coverage:** Identification of internal and external stakeholders, completeness of stakeholder mapping, and regular review of stakeholder groups.
- **D2 · Influence & Decision-Making Power:** Assessment of stakeholder influence on strategy, curriculum, resource allocation, and sustainability and digital transformation initiatives.
- **D3 · Interest & Commitment to Sustainability:** Assessment of stakeholder interest in sustainability objectives, participation, alignment with institutional priorities, and willingness to contribute.
- **D4 · Communication & Information Exchange:** Assessment of communication channels, frequency and quality of communication, transparency, and opportunities for dialogue and feedback.
- **D5 · Collaboration & Co-Creation:** Assessment of stakeholder involvement in consultations, planning, decision-making, curriculum development, projects, and innovation activities.
- **D6 · Partnership Value & Strategic Contribution:** Assessment of how stakeholder partnerships contribute to labour market relevance, work-based learning, organizational learning, resource access, and sustainability goals.
- **D7 · Monitoring, Engagement Quality & Continuity:** Assessment of participation monitoring, stakeholder satisfaction, partnership outcomes, engagement effectiveness, and long-term relationship development.

Scoring key:

1	Emerging (initial) – ad hoc, limited, and dependent on individual initiative	2	Developing – occurs in pockets, but is not yet systematic
3	Integrated – embedded, consistent, and informs decisions	4	Transformative (Strategic) – strategic, collaborative, evidence- based, creates measurable value.

Scores of 3 or 4 must be backed by documented evidence – the rule of thumb is "no evidence, no high score," since the tool is meant to measure reality rather than aspiration.

Process

Working group members map and prioritize stakeholders using the Influence-Interest Matrix, score each indicator individually, and agree on a consensus score supported by evidence. Indicator scores are averaged to produce dimension scores, creating a stakeholder engagement baseline that informs engagement planning and improvement actions.

Ref	Indicator	Score (1–4)	Evidence / notes
D1 · Stakeholder Identification & Coverage			
1.1	The institution has identified and documented relevant internal stakeholders involved in sustainability and digital transition activities.		
1.2	The institution has identified and documented relevant external stakeholders involved in sustainability and digital transition activities.		
1.3	A stakeholder map exists that covers the main groups affected by or able to influence institutional sustainability objectives.		
1.4	Stakeholder mapping is reviewed and updated on a regular basis.		
<i>Dimension average (D1) – carry to Tool C</i>			
D2 · Influence & Decision-Making Power			
2.1	The institution understands which stakeholders have significant influence on strategic decisions.		
2.2	Stakeholders with influence on curriculum design and learning provision have been identified.		
2.3	Stakeholders with influence on resource allocation and investment decisions have been identified.		
2.4	Stakeholders with influence on sustainability and digital transformation initiatives are actively recognized and monitored.		
<i>Dimension average (D2) – carry to Tool C</i>			
D3 · Interest & Commitment to Sustainability			
3.1	Stakeholder interest in sustainability and digital transition objectives is regularly assessed.		
3.2	Key stakeholders actively participate in sustainability-related activities and initiatives.		
3.3	Stakeholder priorities are aligned with institutional sustainability objectives.		
3.4	Stakeholders demonstrate willingness to contribute time, expertise, or resources to sustainability initiatives.		
<i>Dimension average (D3) – carry to Tool C</i>			

Ref	Indicator	Score (1–4)	Evidence / notes
D4 · Communication & Information Exchange			
4.1	Appropriate communication channels exist for engaging stakeholders on sustainability issues.		
4.2	Sustainability-related information is communicated to stakeholders on a regular basis.		
4.3	Information shared with stakeholders is clear, transparent, and accessible.		
4.4	Mechanisms exist for two-way communication and stakeholder feedback.		
<i>Dimension average (D4) – carry to Tool C</i>			
D5 · Collaboration & Co-Creation			
5.1	Stakeholders are involved in consultations, workshops, or engagement events.		
5.2	Stakeholders contribute to planning and decision-making processes related to sustainability.		
5.3	Stakeholders participate in the co-design of curricula, projects, or initiatives.		
5.4	Stakeholders are actively engaged in partnership, innovation, or sustainability activities.		
<i>Dimension average (D5) – carry to Tool C</i>			
D6 · Partnership Value & Strategic Contribution			
6.1	Stakeholder partnerships contribute to understanding labour market and skills needs.		
6.2	Stakeholder partnerships support work-based learning, apprenticeships, or practical learning opportunities.		
6.3	Stakeholder engagement provides access to knowledge, expertise, networks, or resources.		
6.4	Stakeholder partnerships contribute to institutional sustainability and digital transition objectives.		
<i>Dimension average (D6) – carry to Tool C</i>			

Ref	Indicator	Score (1–4)	Evidence / notes
D7 · Monitoring, Engagement Quality & Continuity			
7.1	Stakeholder participation in engagement activities is systematically monitored.		
7.2	Stakeholder satisfaction with engagement processes is regularly assessed.		
7.3	Outcomes and impacts of stakeholder partnerships are tracked and evaluated.		
7.4	Long-term stakeholder relationships and engagement commitments are actively maintained.		
Dimension average (D7) – carry to Tool C			

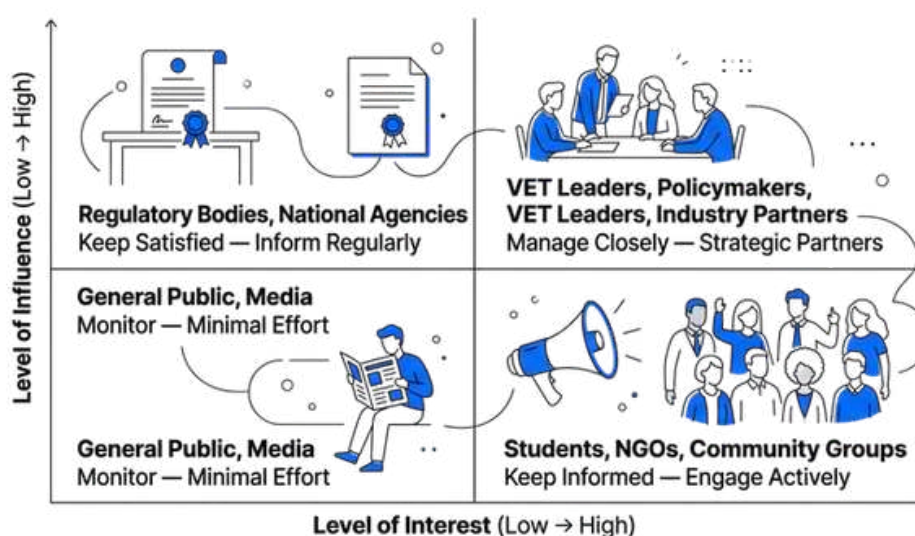
Influence–Interest Matrix

The assessment is supported by an Influence–Interest Matrix that helps institutions identify which stakeholders require the highest level of engagement. Stakeholders are mapped according to:

- **Influence:** the ability to affect decisions, resources, policies, or implementation outcomes.
- **Interest:** the degree to which stakeholders are affected by or actively interested in sustainability and digital transition activities.

This enables institutions to prioritize engagement efforts and allocate resources to the stakeholders most critical to the success of the transition.

Influence–Interest Matrix



A practical prioritization tool for designing targeted engagement strategies.

Tool B

Stakeholder Engagement Strategy Canvas

Purpose

Tool B helps VET institutions design a structured stakeholder engagement strategy that defines how priority stakeholders will be informed, consulted, involved, collaborated with, or empowered throughout the sustainability and digital transition process.

Stakeholder Engagement Strategy Canvas

Selective example, be specific

B1 Priority Stakeholder Group	Which stakeholder group are we engaging?	Local and regional industry partners
B2 Sustainability Objective	What sustainability challenge, goal, or opportunity are we addressing?	Strengthen green and digital skills within VET programmes
B3 Engagement Purpose	What do we want from this stakeholder group?	Identify current and future workforce needs and support curriculum development
B4 Engagement Level	Inform • Consult • Involve • Collaborate • Empower	Collaborate
B5 Key Messages	What do stakeholders need to understand?	Partnership helps ensure graduates have skills relevant to industry and sustainability challenges
B6 Activities & Methods	Workshop, survey, focus group, meeting, co-design session, advisory board, project collaboration, etc.	Employer workshops, focus groups, curriculum review meetings, workplace visits
B7 Roles & Responsibilities	Who leads? Who supports?	Curriculum team leads; employers provide expertise and labour market insights
B8 Resources & Timeline	Timeline: When will engagement take place? Resources: Budget, staff time, tools, facilities, expertise	Staff time, meeting facilities, online collaboration tools; 3-month engagement cycle
B9 Success Indicators	Participation, satisfaction, partnerships, outputs, actions completed	Number of employers engaged, curriculum improvements implemented, new apprenticeship opportunities established
B10 Expected Outcomes	What change or result is expected from engagement?	Stronger alignment between VET programmes, labour market needs, and sustainability transition priorities
B11 Potential Risks & Mitigation	What risks may arise and how will they be addressed?	Low employer availability; mitigated through flexible scheduling and digital collaboration options

How to Complete the Stakeholder Engagement Strategy Canvas

The assessment is supported by an Influence–Interest Matrix that helps institutions identify which stakeholders require the highest level of engagement. Stakeholders are mapped according to:

How to Complete the Stakeholder Engagement Strategy Canvas



→ Canvas feeds directly into Tool C: Stakeholder Action Plan & Monitoring Tracker

Integrating Tool B with Tools A and C

The three tools form a connected stakeholder engagement cycle:

Tool A (Influence–Interest Matrix) identifies and prioritizes stakeholders. **Tool B** (Strategy Canvas) translates findings into a practical engagement strategy. **Tool C** (Action Plan & Monitoring Tracker) converts the strategy into implementation actions with tracking.



Tool C

Stakeholder Action Plan and Monitoring Tracker

Purpose

Tool C helps VET institutions implement, monitor, and continuously improve stakeholder engagement activities. It translates engagement strategies into concrete actions, responsibilities, timelines, and performance measures, ensuring that stakeholder contributions support the institution's sustainability and digital transition goals.

Action Sequence



Process

Following completion of Tool B, engagement activities are recorded in the tracker, with clear responsibilities, timelines, and success indicators. Progress is reviewed regularly, outcomes are documented, and lessons learned are used to improve future engagement activities.



Suggested Duration

Ongoing throughout the stakeholder engagement cycle, with quarterly or semester-based reviews.



Main Output

A monitored stakeholder action plan that tracks implementation, measures engagement outcomes, and supports continuous improvement of stakeholder relationships and sustainability initiatives.

C2 Stakeholder engagement action planner

Stakeholder Group	Action / Activity	Objective	Responsible Person(s)	Timeline	Resources Required	Success Indicator(s)	Status	Results / Evidence	Follow-Up Actions
							☐ Not Started ☐ In Progress ☐ Completed		
							☐ Not Started ☐ In Progress ☐ Completed		
							☐ Not Started ☐ In Progress ☐ Completed		
							☐ Not Started ☐ In Progress ☐ Completed		

Example:

Stakeholder Group	Action / Activity	Objective	Responsible Person(s)	Timeline	Resources Required	Success Indicator(s)	Status	Results / Evidence	Follow-Up Actions
Industry Partners	Curriculum co-design workshop for green skills	Identify emerging skills needs and improve curriculum	Sustainability Coordinator and Curriculum Team	March 2027	Meeting room, workshop materials, facilitator	10 employers engaged; 5 recommendations ; satisfaction >=80%	Completed	12 employers; 7 recommendations ; satisfaction 88%	Integrate into programme review; follow-up meeting

Example of Expected Outcome: Improved alignment between VET programmes, labour market needs, and sustainability transition priorities, leading to stronger partnerships and more relevant learning opportunities.

C3 Stakeholder engagement action planner

Category	Indicators
Participation & Reach	• Number of stakeholders engaged • Participation rate by stakeholder group • Attendance at workshops or meetings • Diversity of stakeholder representation • Number of stakeholder groups actively involved
Communication & Engagement	• Number of communication activities delivered • Stakeholder awareness of sustainability initiatives • Response rate to surveys or consultations • Frequency of stakeholder interactions • Quality of stakeholder feedback received
Collaboration & Co-Creation	• Number of consultations completed • Number of co-creation workshops conducted • Number of stakeholder recommendations received • Number of co-developed projects or initiatives • Stakeholders in decision-making processes
Partnership Development	• Number of active partnerships • New partnerships established • Partnership retention rate • Number of joint activities implemented • Partner satisfaction level
Curriculum & Learning Impact	• Curriculum improvements influenced by stakeholders • New learning modules developed collaboratively • Industry contributions to curriculum design • New work-based learning opportunities created • Apprenticeship or internship opportunities
Sustainability & Digital Transition	• Sustainability initiatives supported by stakeholders • Green and digital transition projects launched • Resources secured through partnerships • Contributions to institutional sustainability goals • Progress against sustainability action plan
Quality & Satisfaction	• Stakeholder satisfaction score • Perceived value of engagement activities • Stakeholder trust and confidence levels • Achievement of engagement objectives • Lessons learned identified and documented
Continuous Improvement	• Percentage of planned actions completed • Follow-up actions implemented • Improvements based on stakeholder feedback • Review meetings conducted • Updates to engagement strategy completed

9. Interpreting your results

The matrix measures stakeholder ecosystem maturity across seven dimensions,

D1. Stakeholder Identification & Coverage

D2. Influence & Decision-Making Power

D3. Interest & Commitment

D4. Communication & Information Exchange

D5. Collaboration & Co-Creation

D6. Partnership Value & Strategic Contribution

D7. Monitoring, Engagement Quality & Continuity

Sustainable stakeholder engagement develops progressively: identify stakeholders (D1), understand their influence (D2), build commitment (D3), establish communication (D4), enable collaboration (D5), create strategic value (D6), and continuously improve through monitoring and evaluation (D7).

How mature the institution is in each stage of the stakeholder engagement cycle?

Since every indicator is scored 1–4, dimension averages will also range from 1.0–4.0.

From 0 to 1 – No evidence / Not applicable / Not started.

Band	Overall avg	Maturity level - what it means	Recommended strategic focus
Emerging (initial)	1.0 – 1.7	Stakeholder engagement is largely informal, reactive and dependent on individual relationships.	Build the foundations for systematic stakeholder management.
Developing	1.8 – 2.5	Stakeholders are identified and engaged in some areas, but approaches remain inconsistent and fragmented.	Build the foundations for systematic stakeholder management.
Integrated	2.6 – 3.3	Stakeholder engagement is embedded in institutional activities and supports sustainability objectives.	Strengthen collaboration quality, strategic value and evidence of impact.
Transformative (Strategic)	3.4 – 4.0	Stakeholder engagement functions as a strategic capability that drives institutional sustainability and innovation.	Scale impact, strengthen partnerships and influence wider ecosystems.



Do not focus only on raising scores.

The objective is to move from stakeholder awareness (D1–D2), to stakeholder engagement (D3–D4), to stakeholder collaboration (D5), to stakeholder value creation (D6), and finally to continuous learning and improvement (D7). Institutions achieve the greatest progress when improvement actions target the weakest link in this engagement cycle.

Cross-Dimension Strategic Priorities

Weakest Dimension	Strategic Priority
D1	Improve stakeholder visibility and coverage
D2	Improve stakeholder prioritisation and influence
D3	Increase stakeholder motivation and commitment
D4	Strengthen communication and feedback mechanisms
D5	Move from consultation to co-creation
D6	Improve partnership outcomes and strategic value
D7	Strengthen monitoring, evidence and continuous improvement

Additional Cross-Profile Actions

Result Pattern	What It Means	Priority Action
High D1-D2, Low D5-D7	Good stakeholder understanding but weak co-creation and monitoring	Move from mapping to active collaboration and tracking
High D1-D4, Low D5-D6	Stakeholders are informed but not co-creating value	Increase co-creation and partnership development
High D5, Low D7	Strong engagement but no evidence of impact	Develop monitoring and evaluation frameworks
High D6, Low D3	Partnerships exist but commitment is shallow	Build stakeholder ownership and intrinsic motivation
Low D4 across all profiles	Communication is the bottleneck	Improve communication channels and frequency
Low D7 across all profiles	Impact cannot be demonstrated	Prioritise measurement and evidence collection

10. From Assessment to Action

Close the stakeholder engagement assessment with a clear transition to action, not as a reporting exercise. Three transfers matter: the stakeholder map and engagement evidence should inform sustainability, curriculum and institutional planning; the dimension profile, priority gaps and recommended actions should become the baseline for future engagement objectives; and identified monitoring weaknesses should feed directly into quality assurance and performance improvement processes.

11. Quality checklist

Before declaring Step 2 complete, confirm:

✓	Quality Check Item
☐	Senior management mandate secured and communicated to the whole institution
☐	Working group includes teaching, operations and QA – and learners
☐	Tool B context canvas completed with external input
☐	Every score of 3 or 4 in Tool A is backed by documented evidence
☐	Individual scoring completed before group moderation
☐	Provisional results validated in a stakeholder session
☐	Baseline report (Tool C) approved by leadership and shared internally
☐	Findings handed to the Step 2–3 team with named owners and a review date

Go to Step 3 when...

- ✓ The stakeholder engagement profile (D1–D7) is complete.
- ✓ Priority strengths and improvement areas have been identified.
- ✓ Initial actions and ownership for improvement have been agreed.
- ✓ Results are ready to inform the institutional sustainability and digital transition roadmap.

The Stakeholder Engagement Assessment Framework draws on internationally recognised stakeholder engagement standards and governance approaches, including AA1000SES, ISO stakeholder engagement guidance, ISO 26000 and OECD participation principles. Its application within vocational education and training is further informed by European sustainability and skills policy frameworks, including the European Green Deal, the European Skills Agenda, GreenComp, the Council Recommendation on learning for the green transition and sustainable development, and the X-VET Integrated Sustainability Competences Framework.

The dimensions reflect common principles found across stakeholder engagement standards, including stakeholder identification, influence analysis, participation, communication, partnership development, and continuous improvement.



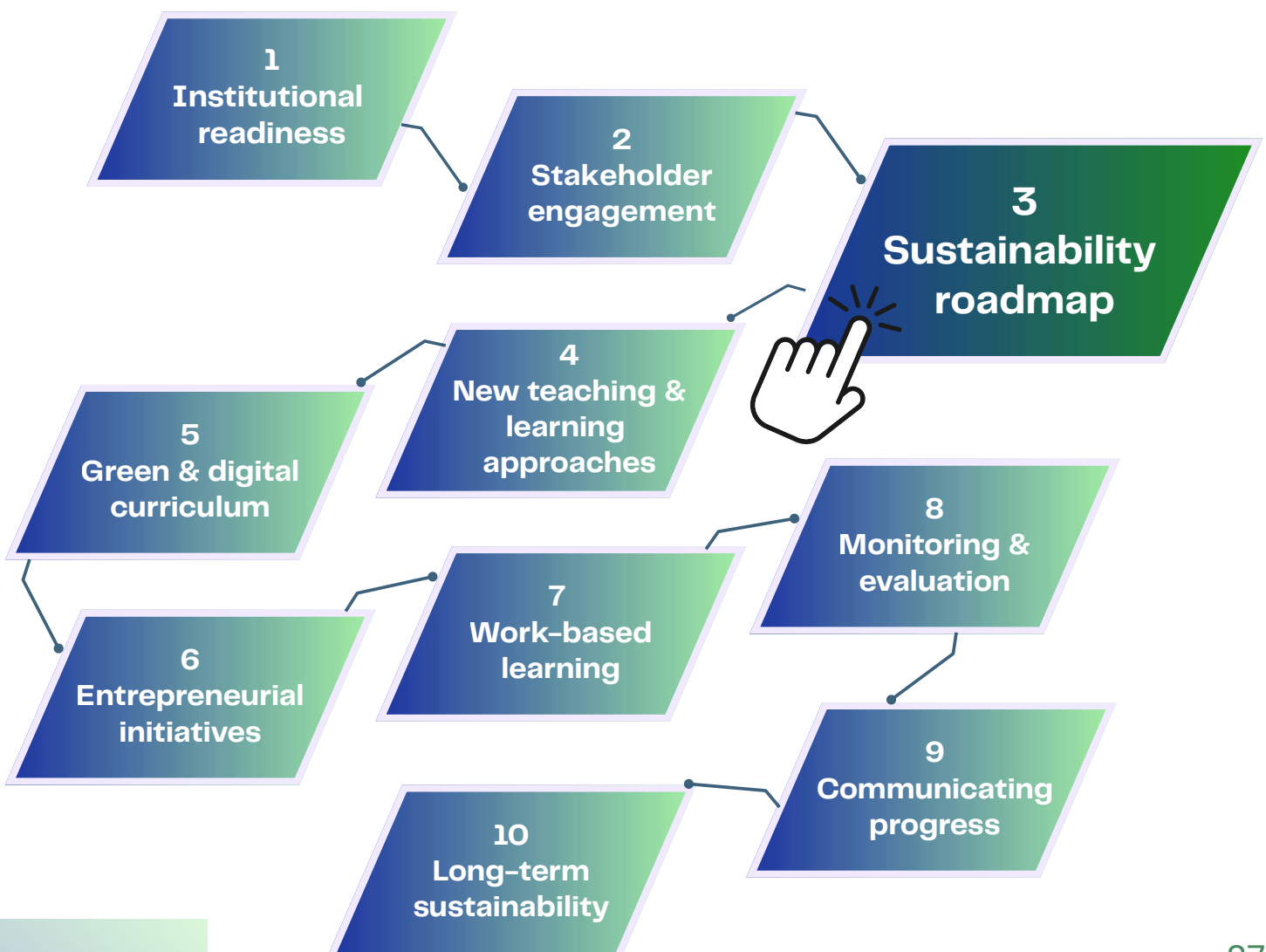
STEP 3 - Sustainability roadmap

1. Purpose of this guide

This guide supports VET institutions in turning evidence from previous steps, or equivalent institutional sources, into a practical Sustainability Roadmap aligned with their educational and organisational objectives. It helps institutions translate readiness findings, stakeholder input, identified needs and available resources into a coherent pathway for institutional change.

It guides institutions in selecting priorities and defining outcomes, actions, responsibilities, resources, indicators and review arrangements. The process should remain realistic and proportionate to the institution's capacity. Important evidence gaps, assumptions, constraints and dependencies should be clearly recorded so that they can be reviewed during implementation.

2. Step 1 within the 10-Step Process Model



Step 3 occupies a central position in the X-VET 10-Step Process Model. It connects evidence-gathering and consultation with the practical implementation stages that follow. The preceding steps help the institution understand its current position and stakeholder perspectives. Step 3 converts that information into strategic choices: which issues receive priority, what changes the institution intends to achieve, and how those changes will be organised over time.

Scope of Step 3

Step 3 establishes strategic direction, objectives, ownership, initial resource requirements, expected results, indicators and review arrangements. Steps 4–10 further develop and implement the relevant teaching, curriculum, entrepreneurship, partnership, monitoring, communication and long-term sustainability measures.

How Step 3 draws on the competence framework?

Roadmapping is led by Competence 2 (Analysing Contexts and Designing Sustainability Roadmaps). It requires the mandate of Competence 1, evidence discipline from Competence 3, stakeholder collaboration through Competence 6, resource realism from Competence 9 and future-oriented thinking from Competence 10.

3. Why a sustainability roadmap matters in VET

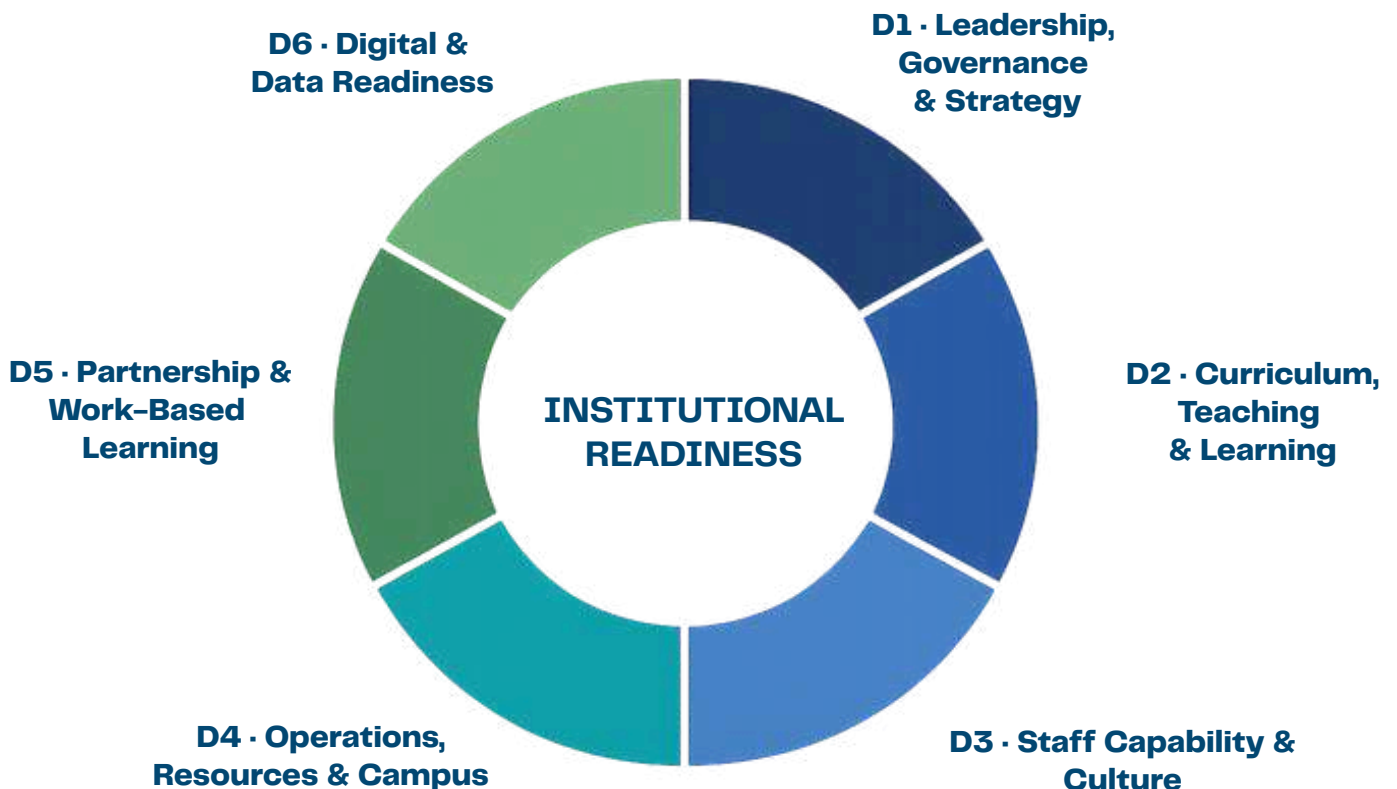
Green, digital and economic transitions affect occupational skills, technologies, workplaces and labour-market needs. VET institutions therefore need to connect sustainability with their educational mission, governance, curriculum, staff development, operations and partnerships. This requires a coordinated approach rather than isolated activities in individual departments or programmes. GreenComp supports this whole-institution perspective and recommends adapting sustainability actions to the educational setting, institutional capacity and local context (European Commission, 2022).

A Sustainability Roadmap turns evidence and stakeholder input into agreed priorities, targets, responsibilities, resources and indicators. It helps the institution move from separate projects to a coordinated and measurable direction for change, while making responsibilities and expected results more visible. This reflects the X-VET objective of embedding sustainability across organisational policies, teaching practices, institutional operations and industry cooperation through a practical ten-step process.

4. The six roadmap dimensions

The Roadmap uses the six institutional dimensions introduced in Step 1. They provide a common structure for connecting readiness findings with priorities, actions and indicators across the institution. This supports the X-VET whole-organisation approach, which integrates sustainability into governance, curricula, operations and institutional cooperation.

Institutions do not need to select priorities in every dimension. They should focus on the areas where change is most important, relevant and feasible.



D1 · Leadership, Governance & Strategy.

Whether sustainability is anchored in mission and strategy, who is accountable for it, whether it has resources, and how far it genuinely shapes management decisions.

D2 · Curriculum, Teaching & Learning.

Whether sustainability learning outcomes run across programmes rather than sitting in a single module, whether pedagogy is experiential and project-based, and whether competences — not just knowledge — are assessed.

D3 · Staff Capability & Culture.

Whether staff have access to relevant professional development, feel confident addressing sustainability in their own subjects, and whether engagement extends beyond a few champions and is recognised by the institution.

D4 · Operations, Resources & Campus.

Whether the institution monitors and manages its energy, water, waste and procurement – and whether the campus and workshops are used as a living lab that makes sustainability visible to learners.

D5 · Partnerships & Work-Based Learning.

Whether employers, local authorities and community organisations are active partners, and whether placements and work-based learning include explicit sustainability content and real challenges.

D6 · Digital & Data Readiness.

Whether digital tools support sustainability learning and monitoring, whether the data needed to track progress is actually available, and whether the footprint of the digital infrastructure itself is considered – the twin-transition dimension.

5. Roadmap building blocks

Each selected priority should be described through the same core elements. This ensures that the Roadmap remains consistent, practical and easy to monitor.

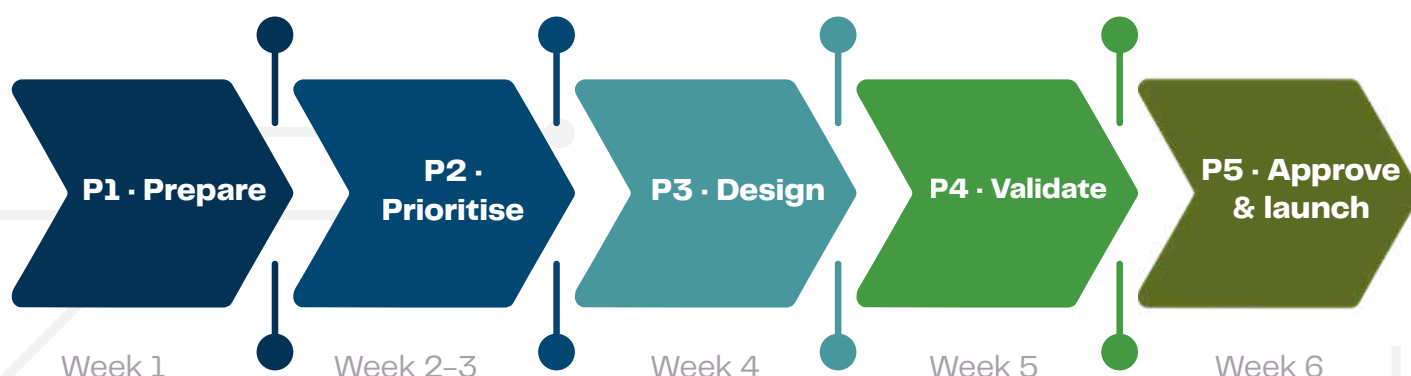
BUILDING BLOCK	GUIDING QUESTION
Evidence and priority	What evidence justifies this priority?
Dimension and transition strands	Which institutional dimension and green, digital or economic transition does it address?
Roadmap objective and VET alignment	What specific change should be achieved, and how does it support the institution's educational or organisational objectives?
Baseline and target	What is the current position and what result should be achieved?
Actions and milestones	What will be done, and by when?
Owner and stakeholders	Who is accountable and who needs to contribute?
Resources	What staff time, funding, equipment, data or external support is required?
Indicators and evidence	How will progress and results be demonstrated?
Risks, mitigation and review	What could affect implementation, how will it be addressed and when will progress be reviewed?

The level of detail may vary according to the size of the institution and the complexity of the priority. However, every action should be connected to a clear objective, responsible owner, timeframe and indicator.

A Roadmap priority is ready for implementation only when the institution knows what should change, who will act, which resources are required and how progress will be measured.

6. A five-phase roadmapping pathway

The Roadmap can be developed through five practical phases. Institutions may adapt the timing, but should retain the sequence from evidence to approval and implementation.



Phase 1 - Prepare (week 1)

Consolidate evidence from previous steps or equivalent institutional sources. The result should be a clear list of the institution's main sustainability gaps, needs and opportunities.

Phase 2 - Prioritise (week 2) >>> Tool A

Compare the identified candidate priorities according to their relevance, impact, urgency and feasibility. Select a focused set of three to six priorities for inclusion in the Roadmap.

Phase 3 - Design (weeks 3-4) >>> Tool B

For each selected priority, define the target, actions, milestones, ownership, required resources, indicators and risks. The result should be a completed priority canvas that is ready for validation.

Phase 4 - Validate (week 5) >>> Tool B-C

Review the proposed priorities and actions with affected staff, learners and relevant partners. Use their feedback to produce a validated and feasible draft Roadmap.

Phase 5 - Approve & launch (week 6) >>> Tool C

Confirm responsibilities, resource commitments, formal approval and the first review date. The result should be an approved Institutional Sustainability Roadmap that is ready for implementation.

Important evidence gaps, assumptions and dependencies should remain visible throughout the process. New evidence may require priorities, targets or actions to be revised.

Tool A

Sustainability Priority-Setting Matrix

Where no reliable baseline exists, the first action must be to establish the baseline. A precise numerical target should not be presented as evidence-based until the starting value is known.

Minimum Input Package

- Institutional Sustainability Readiness Baseline Report from Step 1;
- dimension scores, identified gaps and available evidence;
- stakeholder mapping and consultation results from Step 2;
- institutional strategy and development plans;
- quality assurance findings;
- curriculum and staff-development data;
- labour-market and sectoral evidence;
- information on available staff, funding, equipment and partnerships;
- relevant legal, policy, safety and accreditation requirements;
- identified evidence gaps and assumptions.



Purpose

Use this tool to compare candidate priorities and select a focused set for the Roadmap. Candidate priorities may come from readiness findings, stakeholder input, institutional strategies, quality assurance, labour-market evidence or other relevant sources.

How to use the tool:

1. List the main candidate priorities.
2. Score each criterion from **1** (low) to **4** (very high).
3. Discuss differences and select three to six priorities.



CANDIDATE PRIORITIES	EVIDENCE
1	
2	
3	
4	
5	
6	

CANDIDATE PRIORITY

CRITERIA	SCORE
VET Relevance	☐ ☐ ☐ ☐
Impact	☐ ☐ ☐ ☐
Urgency	☐ ☐ ☐ ☐
Feasibility	☐ ☐ ☐ ☐
Stakeholder support	☐ ☐ ☐ ☐
Evidence strength	☐ ☐ ☐ ☐
Equity, inclusion and just-transition relevance	☐ ☐ ☐ ☐
TOTAL	

*The total score is a discussion aid only. It should not determine the decision automatically.

SCORING CRITERIA

- **VET relevance** — contribution to educational and organisational objectives
- **Impact** — expected educational, environmental, digital, economic or social benefit
- **Urgency** — need for timely action
- **Feasibility** — realistic capacity to achieve progress
- **Stakeholder support** — likely support from people required for implementation
- **Evidence strength** — quality and consistency of available evidence
- **Equity, inclusion and just-transition relevance** — the extent to which the priority reduces inequalities, protects vulnerable groups and distributes benefits, costs and responsibilities fairly

SAFEGUARD QUESTIONS:

- Who benefits from the proposed change?
- Who may face additional costs, workload, barriers or risks?
- Could the action increase existing educational, social or digital inequalities?
- Have learners with disabilities, disadvantaged learners and groups with limited digital access been considered?
- Are the interests of current and future generations considered?
- Are benefits and responsibilities distributed fairly?

DECISION OPTIONS



include in the Roadmap



merge with a related priority



retain for a later review cycle



collect additional evidence before deciding

A lower-scoring priority may still be selected where it reflects a legal requirement, significant institutional risk or important equity concern.

Tool A Output:

A final list of three to six evidence-based priorities for development in Tool B.

Tool B

Sustainability Roadmap Canvas



PURPOSE:

Use this tool to develop each selected priority into a practical Roadmap component. Complete one Canvas for each priority selected through Tool A.

Roadmap element	Response
Priority (title)	
Evidence and rationale	What findings, needs or opportunities justify this priority?
Institutional dimension and transition strand	D1–D6; Green / Digital / Economic / Cross-cutting
Roadmap objective and VET alignment	What specific change should be achieved, and how does it support the institution's educational or organisational objectives?
Baseline	What is the current position or starting value?
Target and deadline	What change should be achieved, and by when?
Key actions and milestones	What will be done, and what are the main deadlines?
Owner and contributors	Who is accountable and who needs to contribute?
Required resources	What staff time, funding, equipment, data or external support is required?
Indicators, evidence sources and review date	How will progress and results be demonstrated?
Main risks and mitigation	What could affect implementation and how will it be addressed?

Before proceeding, confirm that the priority has a clearly defined objective, baseline, measurable target, accountable owner, confirmed or realistically available resources, indicators, evidence sources and review date.

Tool C

Institutional Sustainability Roadmap Summary, Action Plan and Approval

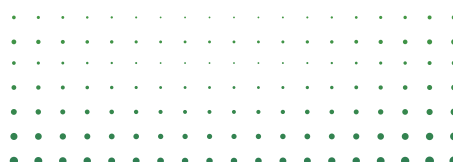


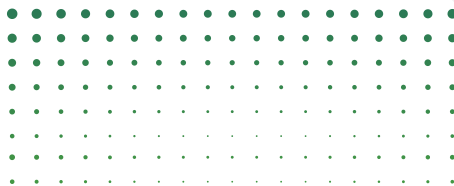
PURPOSE

Use this tool to combine the completed Tool B canvases into one institutional overview and formally approve the Roadmap. Detailed information for each priority remains in the corresponding Tool B canvas.

Roadmap Summary

Roadmap information	Details
Institution	Which institution does this Roadmap apply to?
Planning period	What period does the Roadmap cover?
Sustainability ambition	What overall institutional change should the Roadmap support?
Roadmap coordinator	Who is responsible for coordinating implementation, reporting and review?
Approval date	When was the Roadmap formally approved?
First review date	When will the first formal review take place?





Institutional Priority Overview

The table below provides a concise overview of the selected priorities, their targets, responsible owners, key milestones, indicators and review dates.

Priority	Target	Accountable owner	Main milestone	Key indicator	Review date

Governance Responsibilities

The table below clarifies the main governance roles and responsibilities required to approve, coordinate and implement the Sustainability Roadmap.

ROLE	RESPONSIBILITY
Institutional leadership	Approves the Roadmap and confirms resource commitments
Roadmap coordinator	Coordinates implementation, reporting and review
Priority owner	Leads implementation and reports progress for the assigned priority

Formal Approval

The table below records the formal approval of the Sustainability Roadmap, including the responsible authority, approval date, implementation start and first review date.

APPROVAL INFORMATION	DETAILS
Approved by	
Position or decision-making body	
Approval date	
Implementation start date	
First review date	

Tool C Output

An approved Institutional Sustainability Roadmap supported by detailed priority canvases and ready for implementation, monitoring and transfer to the subsequent X-VET steps.

7. Reviewing and Strengthening the Roadmap

Before approval, review the draft Roadmap for common weaknesses that may reduce its usefulness. The Roadmap should be approved only when its priorities are clear, realistic, resourced and measurable.

COMMON WEAKNESS	SUGGESTED IMPROVEMENT
Too many priorities	Reduce, combine or postpone lower-priority areas
Activities without clear outcomes	Define what should change as a result of the activity
No baseline or target	Add a starting position and a clear success criterion
Unclear ownership	Assign one accountable owner for each priority
Indicators measure only activity	Include indicators of change in practice, performance or outcomes
Unrealistic timelines	Divide implementation into manageable phases
Resources are not confirmed	Record dependencies and identify alternative options
Stakeholder needs are not addressed	Review affected groups, concerns and expected contributions
Green, digital and economic links are unclear	Identify relevant transition strands and possible trade-offs
No review date	Schedule the first review before implementation begins

8. From Roadmap to implementation: Feeding Steps 4-10

Once approved, the Roadmap is transferred to the teams responsible for elaborating and implementing Steps 4–10. Relevant priorities, targets and responsibilities should be transferred to the teams responsible for implementation.

- **Steps 4–5:** Teaching, learning, curriculum and competence priorities
- **Steps 6–7:** Practical challenges, partnerships and work-based learning opportunities
- **Step 8:** Baselines, targets, indicators, evidence sources and review dates
- **Steps 9–10:** Communication commitments and actions requiring long-term institutional support

The Roadmap coordinator should confirm that each team has received the information required for its work.

New evidence generated during implementation should be used to update priorities, targets or actions where necessary.

9. Quality checklist

Before declaring Step 3 complete, confirm that:

- ☐ evidence from previous steps or equivalent institutional sources has been reviewed
- ☐ important evidence gaps, assumptions and dependencies are recorded
- ☐ three to six priorities have been selected and justified
- ☐ each priority is linked to a relevant Roadmap objective and VET alignment
- ☐ green, digital and economic transition strands have been considered
- ☐ each priority has a clearly defined objective, baseline, measurable target and deadline
- ☐ actions, milestones, ownership and required resources are defined
- ☐ stakeholder needs, concerns and contributions are addressed
- ☐ indicators, evidence sources, risks and mitigation measures are recorded
- ☐ institutional leadership has approved the Roadmap and set the first review date
- ☐ relevant information has been transferred to the teams responsible for Steps 4-10

Step 3 is complete when the Roadmap is approved, responsibilities are accepted and implementation can begin.



STEP 4 - New teaching & learning approaches

1. Purpose of this guide

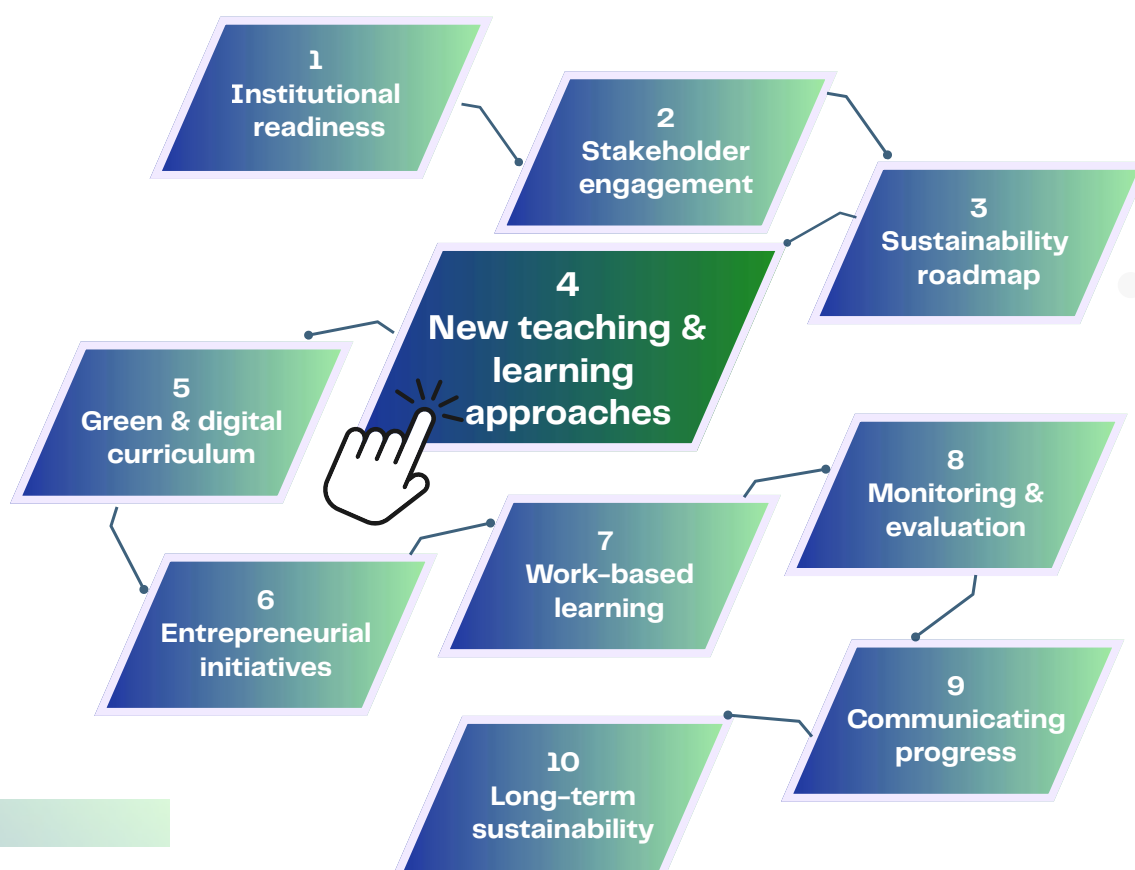
Vocational Education and Training (VET) is facing profound transformation. Climate change, digitalisation, demographic developments and rapidly changing labour markets require new forms of learning that prepare learners not only for current occupations but also for uncertain futures. Traditional approaches centred primarily on knowledge transmission are no longer sufficient to develop the competences needed for sustainable professional practice.

European policy increasingly recognises that sustainability education requires a shift from teaching about sustainability towards learning through sustainability. Learning should therefore become participatory, collaborative, interdisciplinary and closely connected with authentic challenges from vocational practice (UNESCO, 2020; European Commission & JRC, 2022).

The X-VET Transformative Learning Framework responds to this challenge by integrating contemporary educational research with practical implementation strategies for VET institutions. It combines systems thinking, challenge-based learning, collaborative knowledge creation, critical reflection and responsible digital innovation into one coherent pedagogical model. The framework supports institutions in embedding sustainability across learning environments while remaining closely connected to workplace realities and regional partnerships.

This chapter introduces the X-VET Learning Cycle, explains its pedagogical foundations and provides practical guidance for implementing transformative learning across vocational education programmes.

2. Step 1 within the 10-Step Process Model



3. Why Transformative Learning?

Sustainability challenges are characterised by complexity, uncertainty and interconnectedness. Climate change, technological innovation, social inequality and economic transformation cannot be understood through isolated disciplinary perspectives. Consequently, education itself must evolve.

Transformative learning differs fundamentally from traditional instructional models. Rather than focusing primarily on transmitting knowledge, it encourages learners to question assumptions, analyse complex systems, collaborate across disciplinary boundaries and actively participate in developing sustainable solutions.

Stephen Sterling argues that education should not simply include sustainability within existing structures but should itself become sustainable by transforming how institutions think, organise and learn. Sustainability therefore becomes an organising principle for educational practice rather than an additional curriculum topic (Sterling, 2024).

Similarly, Arjen Wals emphasises that meaningful sustainability education develops learners' capacity to navigate uncertainty, work collaboratively and create positive societal change. Learning becomes an active process of inquiry, experimentation and reflection rather than passive knowledge acquisition (Wals, 2024).

This perspective is consistent with UNESCO's Education for Sustainable Development framework, which highlights learner agency, critical thinking, futures literacy and collaborative problem-solving as essential competences for sustainable societies (UNESCO, 2020).

For vocational education, transformative learning means connecting authentic workplace challenges with sustainability competences. Learners develop professional expertise while simultaneously strengthening their capacity to think systemically, innovate responsibly and contribute to sustainable economic and social development.



4. The X-VET Transformative Learning Framework

The X-VET Transformative Learning Framework integrates internationally recognised sustainability education approaches into a coherent pedagogical model designed specifically for vocational education and training.

The framework is based on four complementary pedagogical principles that together create learning environments capable of supporting transformative competence development.

Connected Thinking

Learners analyse professional challenges as interconnected systems, recognising relationships between environmental, economic, social and technological dimensions.

Real-World Learning

Learning is organised around authentic vocational challenges that connect classroom learning with workplaces, communities and regional sustainability priorities.

Collaborative Transformation

Knowledge is created through dialogue, teamwork and partnerships. Learners become active participants in developing sustainable solutions rather than passive recipients of information.

Critical Digital & AI Literacy

Digital technologies and artificial intelligence are used responsibly and critically. Learners evaluate information, recognise bias, understand ethical implications and consider the environmental impacts of digital technologies.

These four pedagogical principles are supported by a Whole Institution Approach that aligns leadership, curriculum, partnerships, assessment and organisational culture with shared sustainability objectives. Together they create the foundation for the X-VET Transformative Learning Cycle presented in the following section.

From Knowledge Transfer to Transformative Learning

The X-VET Transformative Learning Framework recognises that sustainability education is not achieved by adding isolated topics to existing curricula. Instead, sustainability becomes a guiding principle for designing learning environments that enable learners to understand complexity, collaborate across disciplines and contribute actively to sustainable development.

The framework combines four complementary pedagogical principles supported by a Whole Institution Approach. Together they create learning environments that encourage inquiry, experimentation, reflection and responsible action.

Unlike traditional instructional models, the framework emphasises competence development rather than knowledge accumulation. Learners are encouraged to analyse authentic challenges, develop innovative solutions, test ideas in real contexts and continuously reflect on their professional practice.

The framework draws on Education for Sustainable Development (ESD), GreenComp, systems thinking, challenge-based learning and transformative learning research while adapting these concepts to the realities of Vocational Education and Training.

5. The X-VET Transformative Learning Cycle

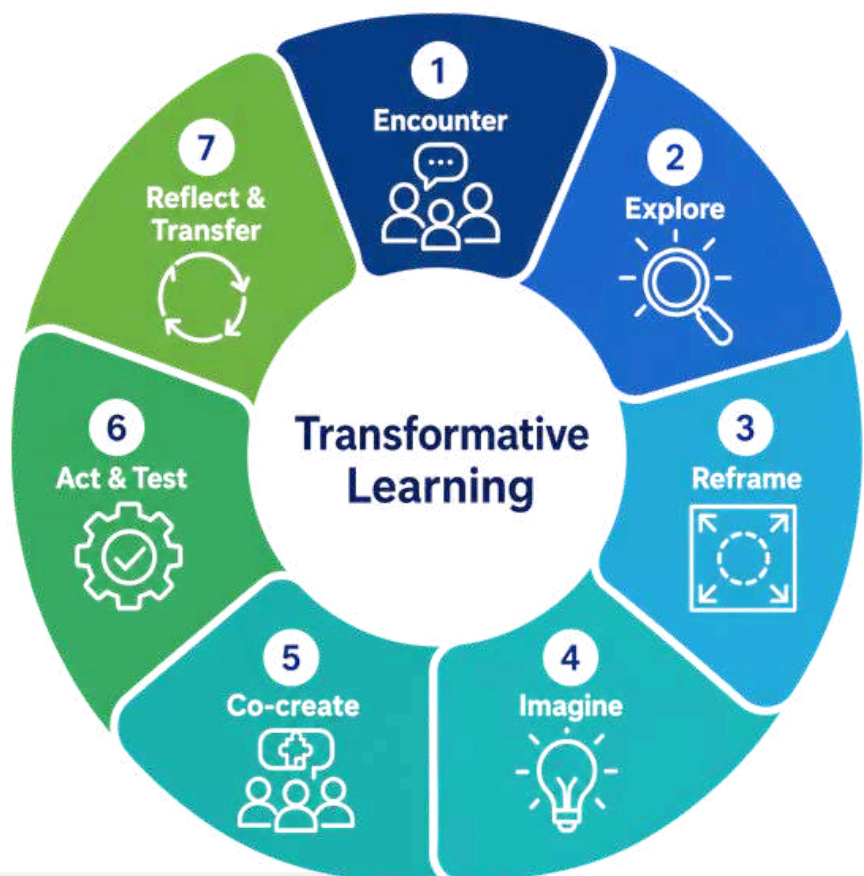
The X-VET Learning Cycle describes learning as a continuous process rather than a linear sequence of instructional activities. Learners repeatedly move through seven interconnected phases while addressing authentic sustainability challenges.

Each phase contributes to the development of professional competence, sustainability literacy and learner agency. Reflection continuously connects practical experience with theoretical understanding, allowing learners to transfer insights to new vocational contexts.

Unlike traditional lesson planning models, the Learning Cycle encourages exploration, experimentation and adaptation. Learning therefore becomes an iterative process that mirrors professional practice and supports lifelong learning.

The seven phases are:

- **Encounter**
- **Explore**
- **Reframe**
- **Imagine**
- **Co-create**
- **Act & Test**
- **Reflect & Transfer**



Encounter

Learning begins with an authentic challenge arising from vocational practice, community needs or broader sustainability issues. Rather than presenting predefined content, teachers introduce meaningful situations that stimulate curiosity and encourage learners to investigate real problems.

Authentic challenges increase learner motivation because they demonstrate the relevance of sustainability within professional practice. Learners immediately recognise that complex problems rarely have simple solutions and often require interdisciplinary cooperation. Examples include reducing food waste in hospitality education, improving energy efficiency in technical workshops, designing inclusive digital services or developing sustainable business concepts for local enterprises.

The Encounter phase establishes the learning context and creates ownership for the subsequent learning process.

Explore

Once learners understand the challenge, they begin investigating its underlying causes, stakeholders and interdependencies.

Systems thinking plays a central role during this phase. Learners collect evidence, analyse relationships between environmental, economic, social and technological dimensions and identify factors influencing the situation. Digital tools, workplace observations, interviews, scientific literature and AI-supported information retrieval may all support exploration. However, learners are encouraged to critically evaluate the reliability, quality and potential bias of information sources before drawing conclusions.

Exploration develops analytical competence while encouraging evidence-based decision making.

Reframe

Complex sustainability challenges often require questioning existing assumptions. During the Reframe phase learners critically examine established routines, dominant perspectives and conventional professional practices.

Reflection encourages learners to consider alternative viewpoints, identify hidden assumptions and recognise that different stakeholders may interpret the same problem differently.



Perspective change represents one of the defining characteristics of transformative learning. Instead of asking "How can we improve the existing solution?", learners increasingly ask "Are we solving the right problem?" or "Could this challenge be approached differently?"

Teachers support this process through guided reflection, dialogue, scenario analysis and critical questioning.

Reframing helps learners move beyond habitual thinking and opens opportunities for creative and innovative solutions that are explored during the next phase of the Learning Cycle.

Imagine

After critically examining the challenge, learners begin developing new ideas and envisioning possible futures. The Imagine phase encourages creativity, innovation and futures thinking by asking learners to explore alternative scenarios rather than searching immediately for one correct solution.

Futures-oriented learning enables learners to anticipate emerging trends, technological developments and societal transformations that may influence vocational practice. Scenario building, design thinking, brainstorming and creative workshops help learners generate multiple possible responses to sustainability challenges.

Rather than predicting the future, this phase strengthens learners' capacity to deal with uncertainty, recognise opportunities and develop innovative solutions that are environmentally responsible, socially inclusive and economically viable.

Teachers act as facilitators by encouraging curiosity, experimentation and open dialogue while creating an atmosphere where unconventional ideas can be explored without fear of failure.



Co-create

Transformative learning is fundamentally collaborative. During the Co-create phase learners work together with peers, teachers and external stakeholders to develop solutions for authentic sustainability challenges.

Collaboration extends beyond classroom activities and may include employers, local authorities, NGOs, community organisations or higher education institutions. By integrating multiple perspectives, learners develop communication skills, negotiation strategies and collective problem-solving abilities.

Co-creation encourages learners to recognise that sustainable development requires shared responsibility and interdisciplinary cooperation. Solutions are therefore developed through dialogue, feedback and iterative improvement rather than individual work alone. The process also strengthens learner agency by demonstrating that meaningful change is achieved collectively rather than individually.



Act & Test

Ideas become meaningful only when they are applied in practice. During the Act & Test phase learners implement, prototype or evaluate their proposed solutions within authentic vocational contexts whenever possible.

Examples may include developing sustainable business concepts, redesigning work processes, creating digital applications, improving resource efficiency or implementing small-scale sustainability projects within partner organisations.

Practical experimentation enables learners to evaluate feasibility, identify unforeseen challenges and collect evidence regarding the effectiveness of their proposed solutions.



Failure is recognised as a valuable learning opportunity. Continuous testing, adaptation and improvement encourage resilience, innovation and evidence-based decision making while strengthening professional competence.

Reflect & Transfer

Reflection represents the final and perhaps most important phase of the Transformative Learning Cycle. Learners evaluate both the outcomes of their work and the learning process itself.

Reflection encourages learners to analyse their decisions, recognise successful strategies, identify areas for improvement and consider how newly acquired competences may be transferred to future professional situations.

Teachers facilitate structured reflection through learning journals, peer feedback, group discussions, portfolios or self-assessment activities.

The objective is not merely to review completed tasks but to develop reflective practitioners capable of continuously improving their professional performance throughout their careers.

The completion of one learning cycle naturally creates the starting point for the next authentic sustainability challenge, making transformative learning a continuous rather than a linear process.



6. Why the Learning Cycle Works

The X-VET Transformative Learning Cycle combines internationally recognised educational approaches into one coherent framework specifically designed for Vocational Education and Training.

Each phase contributes to competence development while supporting the acquisition of sustainability knowledge, professional expertise and responsible citizenship. Rather than separating theory and practice, the model integrates both through authentic learning experiences and continuous reflection.

The Learning Cycle also supports the development of key competences identified by European sustainability frameworks, including systems thinking, critical thinking, collaboration, futures literacy, creativity, learner agency and responsible action.

By repeatedly engaging with authentic challenges, learners gradually develop the confidence and competences needed to navigate complex professional environments characterised by uncertainty and continuous change.

Ultimately, the Learning Cycle supports the transition from knowledge acquisition to competence development, from passive instruction to active participation and from isolated learning activities to a culture of continuous institutional transformation.

Reflect & Transfer

The Learning Cycle provides the structure for transformative learning. However, its successful implementation depends on a set of pedagogical principles that guide teaching practice across all vocational learning environments. The following chapter introduces these principles and explains how they support sustainable competence development within the X-VET Framework.

7. Supporting Pedagogical Principles

The X-VET Transformative Learning Framework is built upon four complementary pedagogical principles. Together they create learning environments that enable learners to develop sustainability competences through authentic experience, collaboration and reflection. Rather than prescribing individual teaching methods, these principles provide a common educational philosophy that can be adapted across vocational sectors and learning contexts.

Connected Thinking

Sustainability challenges are characterised by interdependence. Environmental, economic, social and technological systems constantly influence one another, requiring learners to analyse relationships rather than isolated facts.

Connected Thinking encourages systems thinking by helping learners understand causes, consequences, feedback loops and long-term impacts. Instead of focusing exclusively on individual disciplines, learners examine vocational challenges from multiple perspectives and recognise the interactions between local actions and global developments.

Teaching strategies include systems mapping, stakeholder analysis, interdisciplinary projects and scenario analysis.

Real-World Learning

Learning becomes meaningful when it is connected to authentic professional practice. Real-World Learning therefore places genuine sustainability challenges from workplaces, communities and regional development at the centre of the learning process.

Rather than solving artificial classroom exercises, learners investigate real problems, work with external partners and develop solutions that have practical relevance. This approach strengthens learner motivation while supporting the transfer of knowledge into professional contexts.

Project-based learning, challenge-based learning, service learning and work-based learning all contribute to this principle.

Collaborative Transformation

Transformative learning is inherently collaborative. Sustainable development cannot be achieved through individual expertise alone but requires communication, cooperation and shared responsibility.

Collaborative Transformation promotes teamwork, dialogue and co-creation among learners, teachers and external stakeholders. Through collaboration learners develop social competences, democratic participation and the ability to negotiate diverse perspectives.

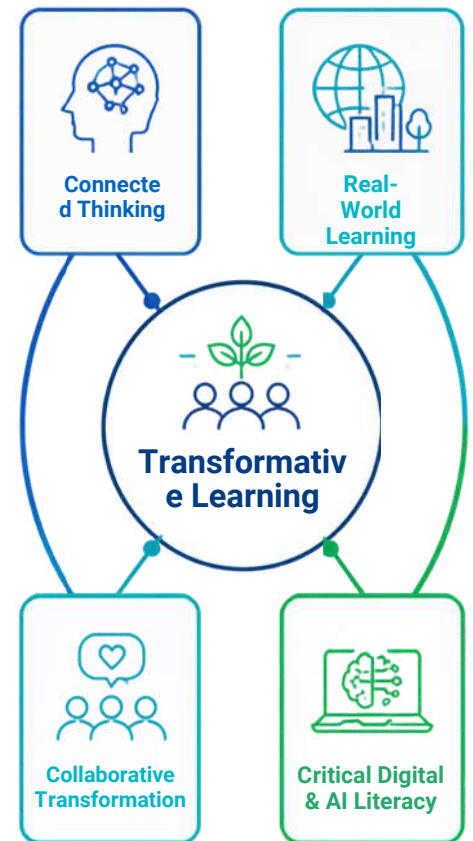
Learning communities also strengthen institutional innovation by encouraging knowledge sharing across departments and professional disciplines.

Critical Digital & AI Literacy

Digital technologies and Artificial Intelligence offer significant opportunities for sustainability education but also raise important ethical, social and environmental questions.

Critical Digital & AI Literacy encourages learners to use digital technologies responsibly while evaluating the reliability of information, recognising algorithmic bias, protecting personal data and considering the environmental footprint of digital infrastructures.

Rather than replacing human judgement, Artificial Intelligence should support critical thinking, creativity and informed decision making.



Whole Institution Approach

8.Reflection Questions

The following questions support institutional discussion and continuous improvement when implementing transformative teaching and learning approaches.

Institutional Reflection

- To what extent do our current teaching methods encourage learner agency rather than knowledge transmission?
- Which authentic sustainability challenges from our vocational sectors could become learning opportunities?
- How effectively do we integrate environmental, social, economic and digital perspectives within learning activities?
- Are learners encouraged to collaborate with external stakeholders?
- How systematically do we develop systems thinking and futures thinking?
- How responsibly are Artificial Intelligence and digital technologies currently integrated into learning?
- Which institutional barriers limit transformative learning?
- Which strengths can be further developed?

Team Reflection

- Which pedagogical approaches already support transformative learning?
- Where could collaboration between teachers be strengthened?
- Which external partners could enrich learning experiences?
- Which professional development opportunities would benefit staff?

Reflection should be regarded as an ongoing institutional process rather than a one-time evaluation activity.

9. Practical Tools

The following questions support institutional discussion and continuous improvement when implementing transformative teaching and learning approaches.

Turning Principles into Practice

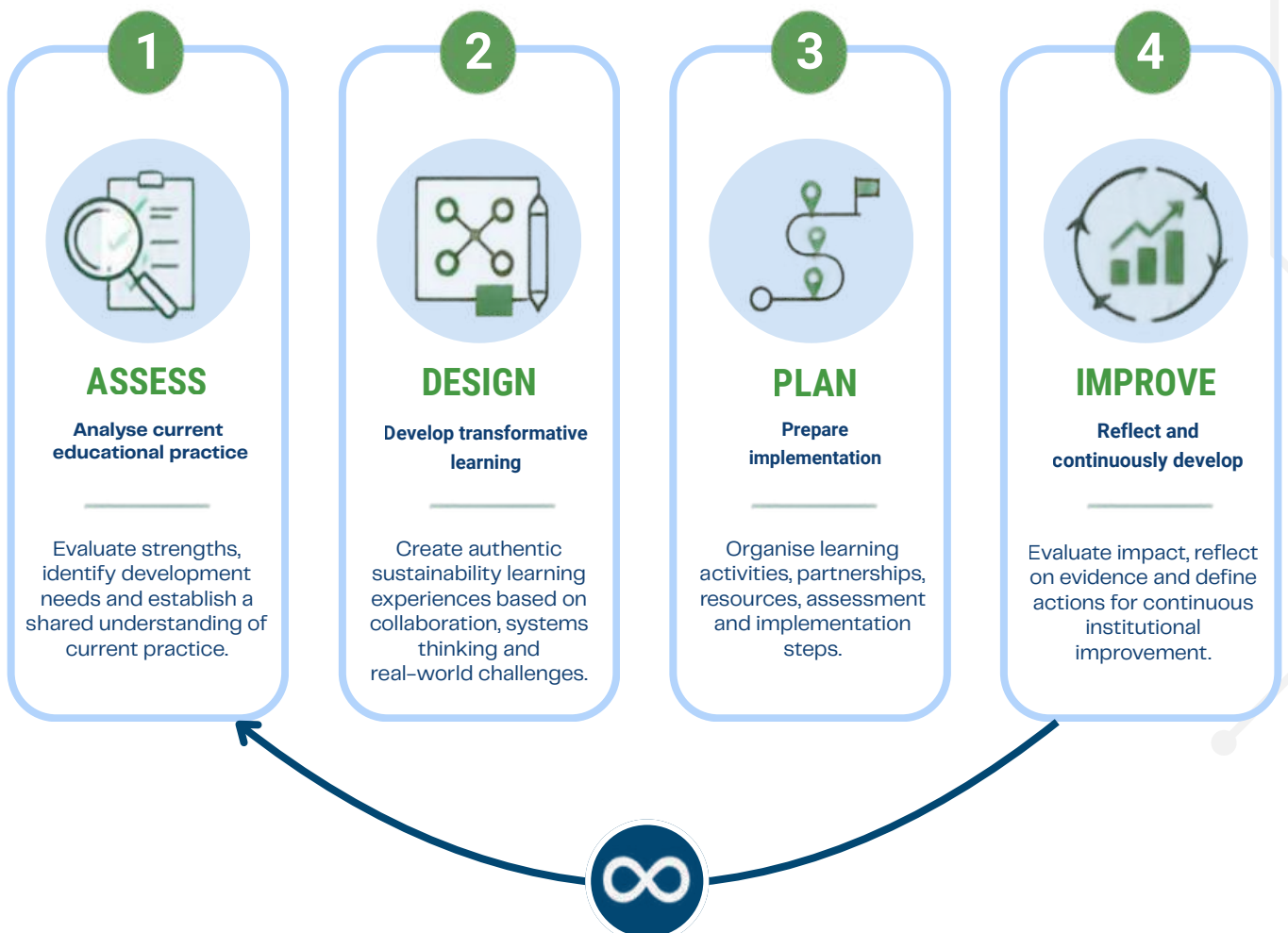
The X-VET Transformative Learning Framework is intended to support vocational education institutions in translating sustainability from a strategic ambition into everyday educational practice. While the previous chapters introduced the conceptual foundations of transformative learning, the following tools help educators, curriculum developers and institutional leaders to apply these principles systematically.

The tools have been designed for individual reflection, collaborative curriculum development and institutional quality improvement. They encourage users to analyse existing practice, design authentic learning experiences and develop concrete implementation strategies that strengthen sustainability competences across vocational education.

Together, the four tools represent a practical implementation pathway:

Assess → Design → Plan → Improve

They can be used independently or as a complete development cycle.



Tool A

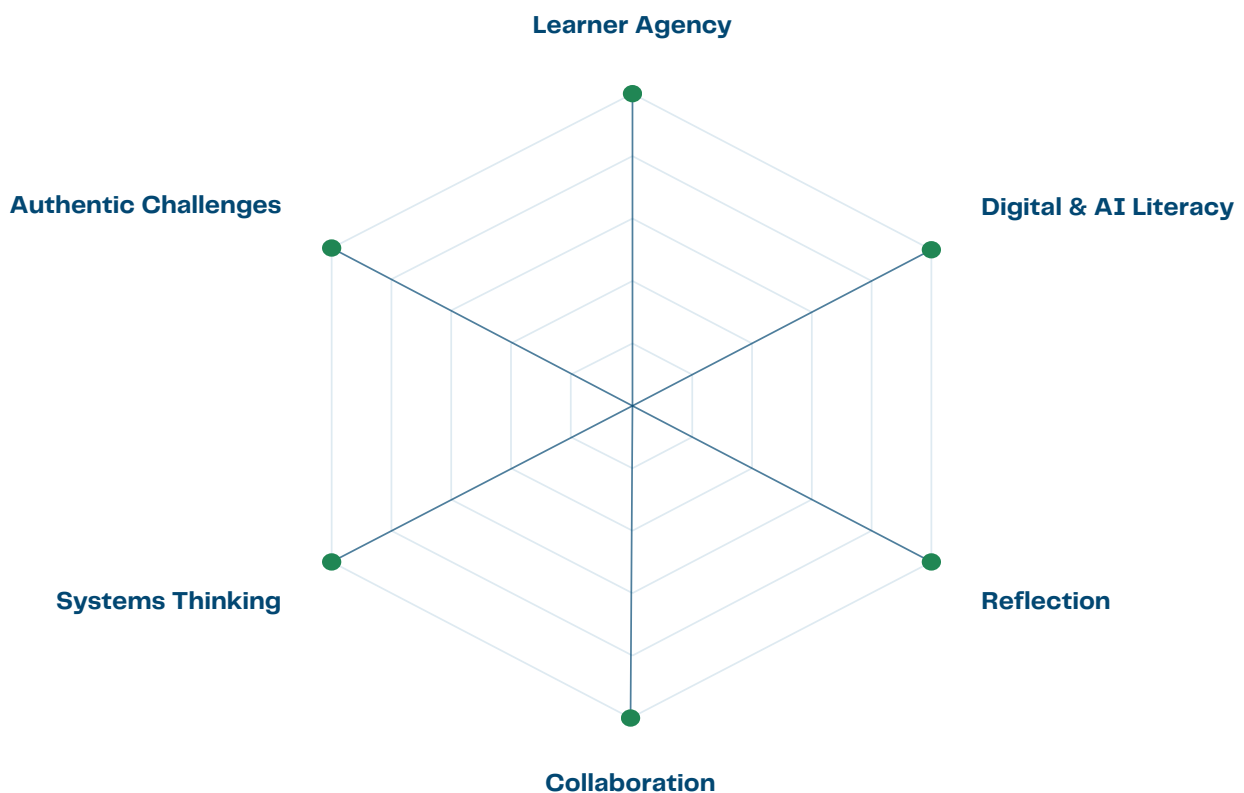
Transformative Learning Self-Assessment

Purpose

Before redesigning learning, it is important to understand current practice. This self-assessment enables teachers and teams to evaluate the extent to which transformative learning principles are already embedded within their teaching. Rather than measuring performance, the tool stimulates structured professional reflection and identifies strengths and areas for development.

How to use

Rate each dimension from 1 (Not yet evident) to 5 (Fully embedded).
Discuss the results individually or within teaching teams.
Identify two priority areas for improvement.



Assessment Scale

- 1 Not yet evident
- 2 Emerging
- 3 Developing
- 4 Established
- 5 Fully embedded

Greatest strength

Priority for development

Tool B

Transformative Learning Design Canvas

Purpose

This canvas supports the design of learning experiences that combine sustainability challenges, competence development and authentic vocational contexts.

Instead of beginning with teaching activities, educators start with a real-world sustainability challenge and build the learning process around meaningful action.

How to use

Work through each canvas section sequentially.

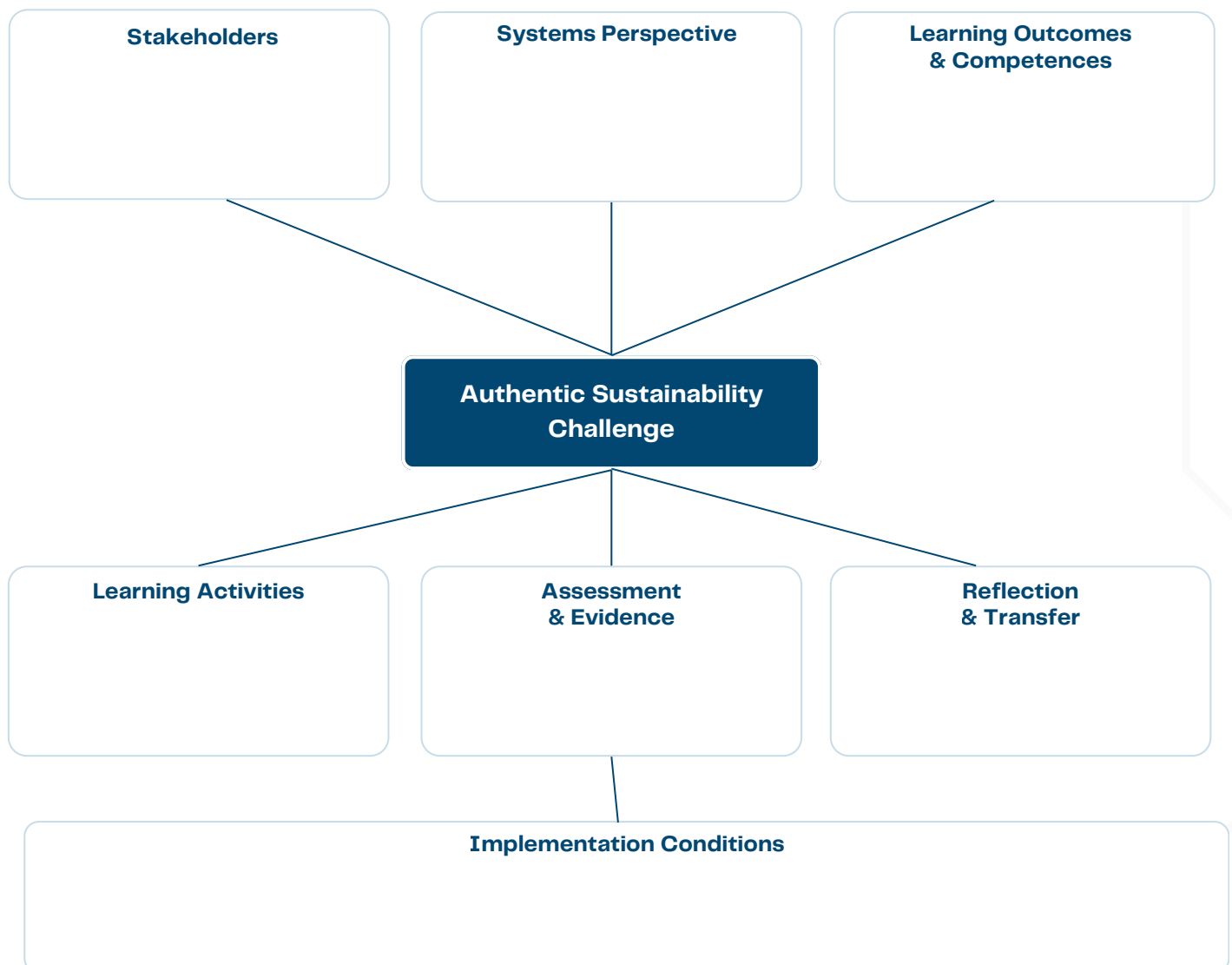
Begin with the authentic challenge.

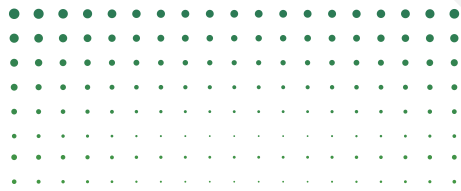
Identify stakeholders.

Define intended competences.

Design learning activities.

Plan assessment.





Tool C

X-VET Learning Cycle Planner

Purpose

The planner translates the X-VET Learning Cycle into an operational planning instrument.

It supports teachers in designing coherent learning sequences where learners gradually move from exploration towards real-world action and critical reflection.

How to use

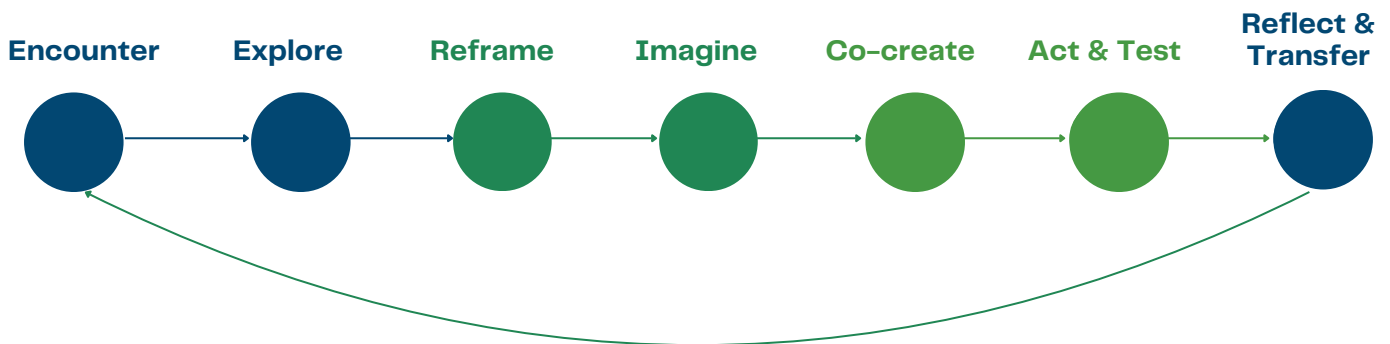
Complete one phase after another.

Identify activities.

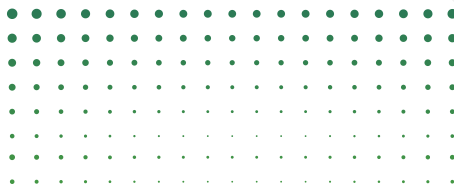
Allocate responsibilities.

Define evidence of learning.

Review coherence.



Activities	Activities	Activities	Activities	Activities	Activities	Activities
Resources & Partners	Resources & Partners	Resources & Partners	Resources & Partners	Resources & Partners	Resources & Partners	Resources & Partners
Evidence of Learning	Evidence of Learning	Evidence of Learning	Evidence of Learning	Evidence of Learning	Evidence of Learning	Evidence of Learning



Tool D

Transformative Learning Improvement Plan

Purpose

Improvement requires continuous reflection and structured follow-up.
This planning tool helps institutions convert insights from the previous tools into concrete improvement measures.
It supports continuous quality development rather than one-time innovation.

How to use

Review the previous tools.
Identify priorities.
Assign responsibilities.
Set milestones.
Review progress periodically.

Action Planning Board

Current Strength	Development Priority	Planned Action	Responsible Person/Team
Required Resources	Timeframe	Evidence of Progress	Review Date

Impact-Effort Matrix

Impact	High Impact / Low Effort	High Impact / High Effort
	Low Impact / Low Effort	Low Impact / High Effort
	Effort	

10. Practical Resources & Implementation Tips

Successful implementation of transformative learning depends less on introducing completely new teaching methods than on redesigning existing learning environments through a sustainability perspective.

The following recommendations may support implementation:

- Begin with authentic local sustainability challenges.
- Encourage interdisciplinary collaboration across vocational subjects.
- Use project-based and challenge-based learning whenever possible.
- Integrate reflection throughout the learning process.
- Develop partnerships with employers and community organisations.
- Use Artificial Intelligence critically and transparently.
- Promote learner participation in planning and evaluating projects.
- Connect classroom learning with institutional sustainability initiatives.
- Share successful practice across departments.
- Review teaching approaches regularly and adapt them based on evidence and learner feedback.

Small, continuous improvements often create more sustainable institutional change than isolated large-scale innovations.



STEP 5 - Green and digital curriculum

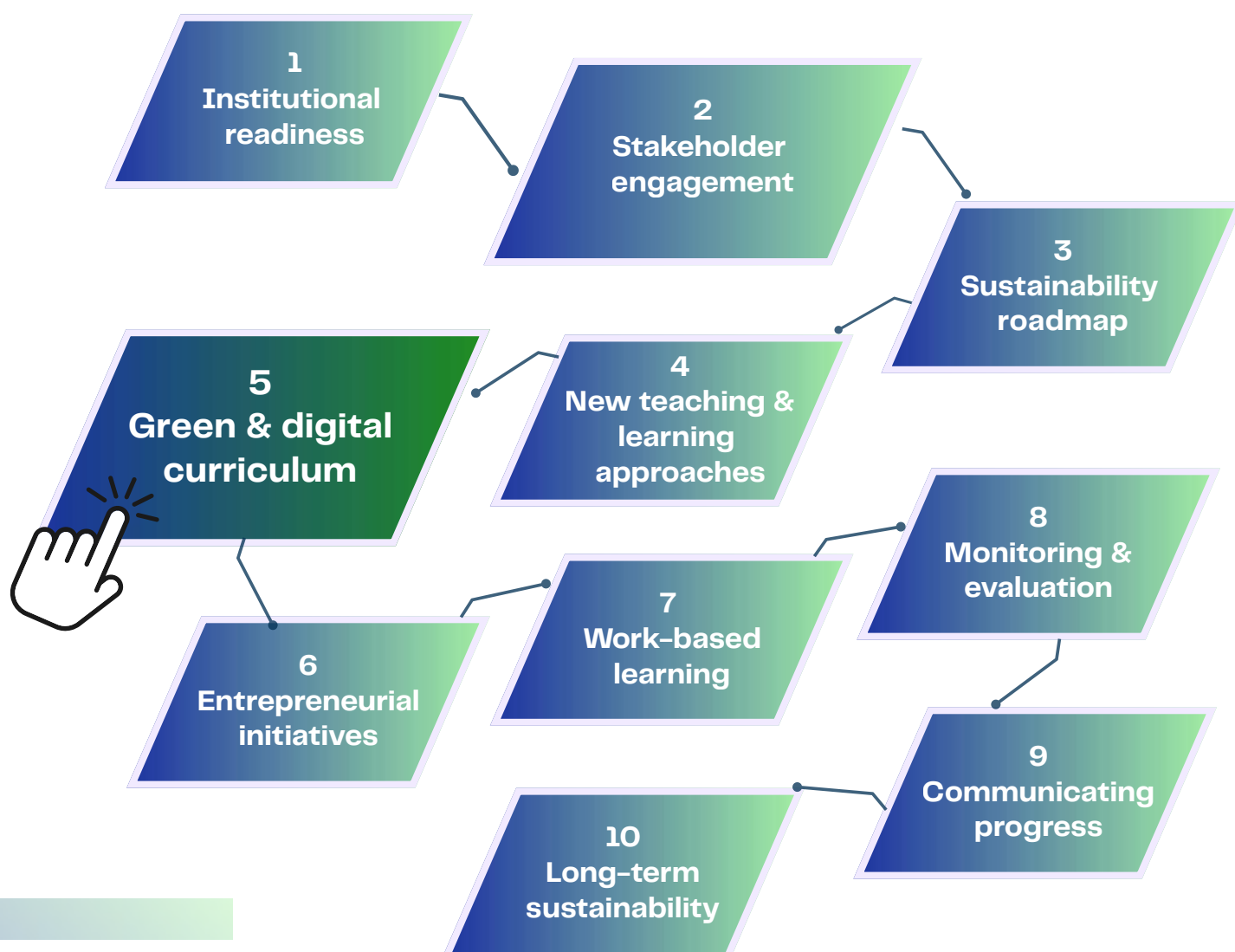
1. Purpose of this guide

Integrating sustainability and digital competences into the curriculum is the fifth step of the X-VET 10-Step Process Model. VET institutions must ensure that sustainability and digital competences are embedded across learning outcomes, teaching, assessment, and learner experiences to prepare learners for the green and digital transition.

This guide is intended for VET leaders, curriculum coordinators, teachers and trainers, quality assurance staff, learners, employers, and industry partners. It provides a practical approach for assessing curriculum integration, identifying improvement priorities, and strengthening curriculum design in alignment with GreenComp, DigComp, labour market needs, and institutional sustainability goals.

The guide includes three practical tools: Tool A: Needs & Curriculum Integration Assessment Matrix, Tool B: Curriculum Design & Enhancement Canvas, and Tool C: Curriculum Action Plan & Monitoring Tracker. Together, these tools help institutions move from curriculum assessment to curriculum enhancement and continuous improvement.

2. Step 5 within the 10-Step Process Model



Step 5 converts sustainability ambitions into learner competences, curriculum outcomes, and learning experiences. Its output, the Curriculum Integration Profile and Enhancement Plan, builds on the priorities identified in Steps 1–4 and translates them into learning outcomes, teaching content, assessment approaches, and programme design. The curriculum enhancements developed in this step inform entrepreneurial initiatives in Step 6, work-based learning in Step 7, and curriculum indicators for monitoring and evaluation in Step 8.

Skipping or rushing this step is one of the main reasons sustainability strategies fail to create lasting impact: sustainability remains an add-on rather than an embedded part of learning, and learners do not develop the green and digital competences needed for future work and society.

How Step 5 draws on the competence framework?

Step 5 is primarily an exercise in Competence 4 – Innovating Educational Approaches in Curricula, translating sustainability ambitions into learning outcomes, teaching content, assessment, and learner experiences. It is informed by Competence 2 – Analysing Contexts and Designing Sustainability Roadmaps, enabled by Competence 5 – Digital and AI Tools for Sustainability Education, and strengthened through Competence 6 – Collaboration for Work-Based Sustainability Learning and Stakeholder Engagement to ensure curriculum relevance and alignment with labour market needs. Competence 10 – Forecasting Sustainability Changes and Challenges helps institutions anticipate future skills requirements, while Competence 3 – Evaluating and Reviewing for Improvement supports evidence-based curriculum enhancement and continuous improvement.

Skipping or minimising this step weakens the model: sustainability remains an add-on rather than an embedded part of learning, curriculum changes lack coherence, and learners may not develop the green and digital competences needed for future work and society.

3. Why Integrating green and digital skills into the curriculum matters

European and international policy emphasises that sustainability and digital competences should be embedded across education and training rather than taught as isolated topics. GreenComp and DigComp provide reference frameworks for integrating these competences into learning outcomes, teaching, assessment, and learner experiences.

Curriculum integration transforms sustainability ambitions into learner competences. By embedding green and digital skills throughout programmes, VET institutions can better prepare learners for evolving occupations, emerging technologies, and sustainability challenges while responding to labour market needs and future skills requirements.

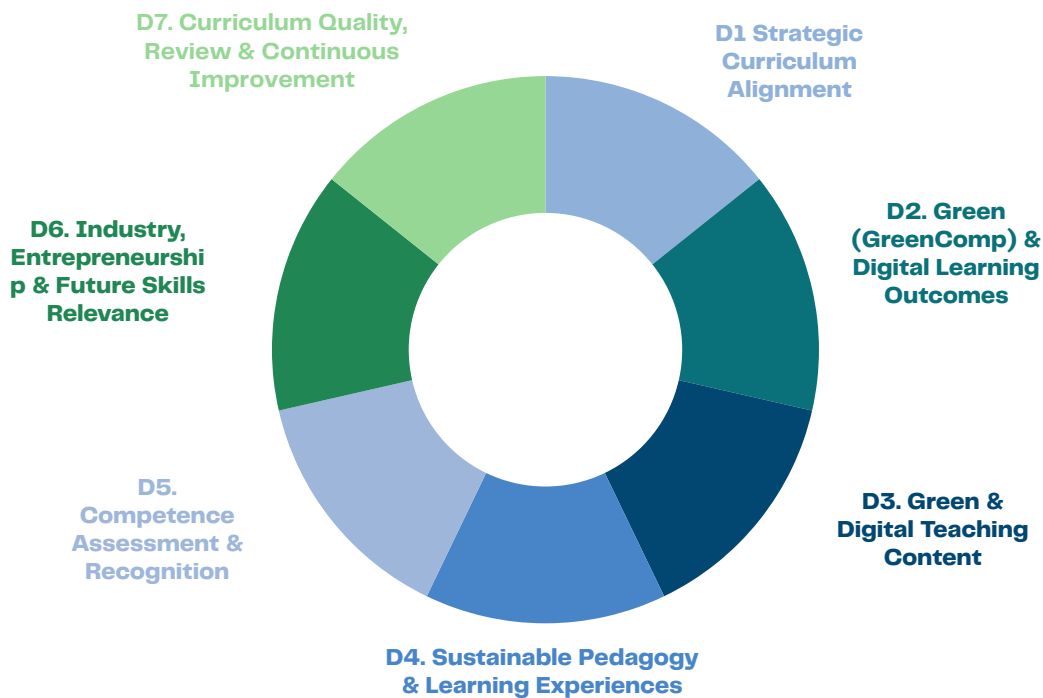
Without systematic curriculum integration, sustainability often remains an additional activity rather than a core educational outcome, digital skills become fragmented across programmes, and learners may be insufficiently prepared for the green and digital transition.

4. The seven dimensions of curriculum integration

These seven dimensions create a logical progression:

Strategy → Outcomes → Content → Pedagogy → Assessment → Relevance → Improvement

which reflects how curriculum integration is commonly reviewed within high-quality VET, higher education, and competence-based learning frameworks.



D1. Strategic Curriculum Alignment: Alignment between curriculum design, institutional sustainability priorities, GreenComp, DigComp, qualification requirements, and future labour market needs.

D2. Green (GreenComp) & Digital Learning Outcomes: Integration of sustainability and digital competences within programme and module learning outcomes, ensuring learners develop the knowledge, skills, attitudes, and competences required for the green and digital transition.

D3. Green & Digital Teaching Content: Embedding sustainability challenges, digital technologies, innovation, and future-oriented skills within curriculum content, modules, and learning resources.

D4. Sustainable Pedagogy & Learning Experiences: Use of learner-centred, active, interdisciplinary, project-based, challenge-based, and experiential learning approaches that promote sustainability and digital competence development.

D5. Competence Assessment & Recognition: Assessment, validation, and recognition of sustainability and digital competences through authentic, competence-based, and workplace-relevant assessment methods.

D6. Industry, Entrepreneurship & Future Skills Relevance: Alignment of curriculum with employer needs, work-based learning, entrepreneurship, innovation, emerging occupations, and future green and digital skills requirements.

D7. Curriculum Quality, Review & Continuous Improvement: Processes for monitoring, evaluating, reviewing, and continuously improving curriculum integration, learner outcomes, and responsiveness to societal and labour market changes.

5. Levels of integration of green and digital skills in the curriculum

Green and digital skills integration is a progressive process that moves from isolated activities to systematic and transformative curriculum practice. Effective integration requires alignment across learning outcomes, content, pedagogy, assessment, industry engagement, entrepreneurship, and quality improvement processes. The four maturity levels below provide a practical framework for understanding current practice and identifying priorities for curriculum enhancement.

In this context, curriculum integration becomes a strategic mechanism for translating sustainability ambitions into learner competences and supporting successful green and digital transitions in VET.

1. Emerging

Green and digital topics appear occasionally but are not formally embedded in curriculum structures, learning outcomes, or assessment.

2. Developing

Some programmes include sustainability and digital competences within learning outcomes or assessment, but implementation remains inconsistent.

3. Integrated

Green and digital competences are systematically embedded across programmes, teaching, assessment, and learner experiences.

4. Transformative

Competences are fully embedded within curriculum culture. Programmes actively address sustainability, digital transformation, and future skills.

6. Key benefits of green and digital skills integration in the curriculum

1

Improved Learner Employability

Learners develop sustainability and digital competences required across occupations and industries.

2

Stronger Labour Market Alignment

Curriculum reflects emerging green occupations, digital transformation, and future workforce needs.

3

More Meaningful Learning

Real-world challenges, workplace scenarios, and interdisciplinary projects increase engagement.

4

Enhanced Problem-Solving & Innovation

Learners analyse complex challenges, generate solutions, and contribute to sustainable innovation.

5

Increased Entrepreneurship

Activities encourage creativity, initiative, opportunity recognition, and sustainable entrepreneurship.

6

Stronger Industry Connections

Collaboration with employers and work-based learning strengthens relevance and transitions.

7

Better GreenComp & DigComp Integration

Competences become visible, measurable, and assessable across programmes.

8

Improved Curriculum Quality

Regular review keeps programmes relevant to environmental, technological, and societal change.

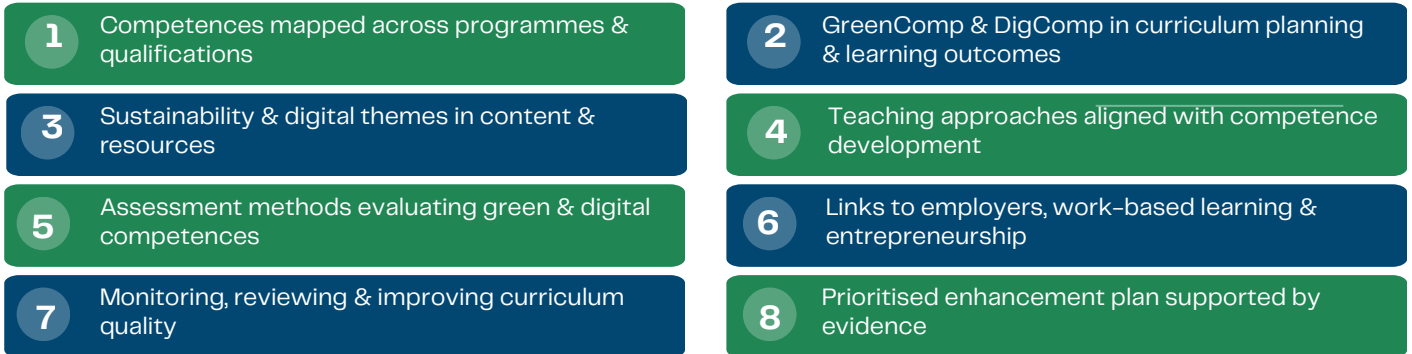
9

Greater Institutional Impact

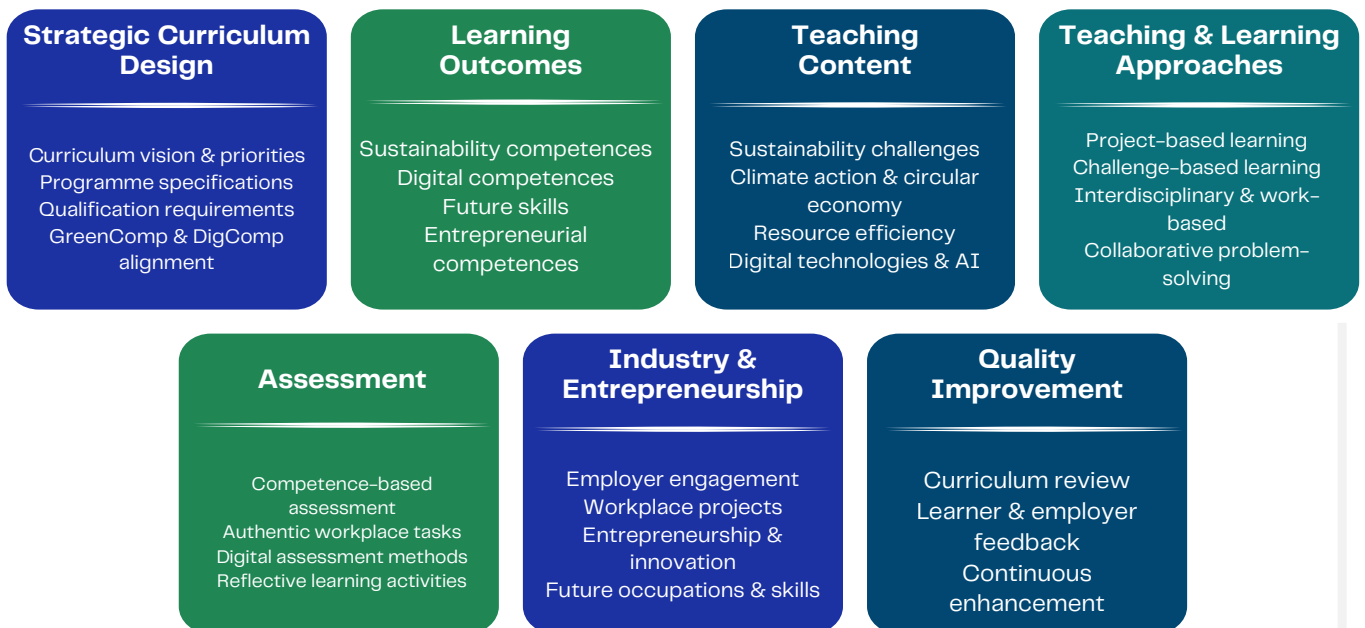
Curriculum integration translates sustainability strategies into tangible learner outcomes.

7. A structured green & digital curriculum integration system

By the end of this step, a VET institution should achieve:



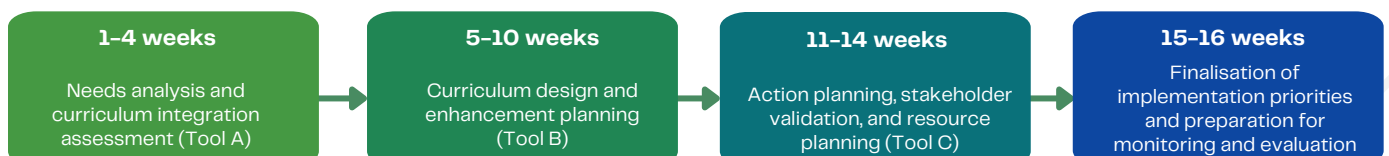
Curriculum Integration Areas



This integration map helps institutions identify where competences are already embedded and where enhancement may be needed.

Duration: Integrating Green and Digital Skills into the Curriculum

A practical duration that can vary depending on the size of the programme portfolio, curriculum review cycles, stakeholder involvement, and institutional approval processes. This timeline is indicative only. Estimated completion time: 8–16 weeks to assess current curriculum integration, identify enhancement priorities, develop curriculum improvements, and establish an implementation and monitoring plan for embedding green and digital competences across programmes.



Total suggested duration: 2–4 months (8–16 weeks)

This timeframe supports a structured progression from assessment and gap analysis to curriculum enhancement, implementation, and continuous improvement.

Tool A

Needs & Curriculum Integration Assessment Matrix

Purpose

The Needs & Curriculum Integration Assessment Matrix helps institutions assess how effectively sustainability and digital competences are embedded across programmes, modules, and learning experiences. By analysing current practice, stakeholder needs, and future skills requirements, the tool helps identify strengths, gaps, and priorities for curriculum enhancement and action planning.

Structure: It covers 7 dimensions, each broken into 4 indicators, for 28 indicators total:

- **D1. Strategic Curriculum Alignment:** Alignment between curriculum design, institutional sustainability priorities, GreenComp, DigComp, qualification requirements, and future labour market needs.
- **D2. Green (GreenComp) & Digital Learning Outcomes:** Integration of sustainability and digital competences within programme and module learning outcomes, ensuring learners develop the knowledge, skills, attitudes, and competences required for the green and digital transition.
- **D3. Green & Digital Teaching Content:** Embedding sustainability challenges, digital technologies, innovation, and future-oriented skills within curriculum content, modules, and learning resources.
- **D4. Sustainable Pedagogy & Learning Experiences:** Use of learner-centred, active, interdisciplinary, project-based, challenge-based, and experiential learning approaches that promote sustainability and digital competence development.
- **D5. Competence Assessment & Recognition:** Assessment, validation, and recognition of sustainability and digital competences through authentic, competence-based, and workplace-relevant assessment methods.
- **D6. Industry, Entrepreneurship & Future Skills Relevance:** Alignment of curriculum with employer needs, work-based learning, entrepreneurship, innovation, emerging occupations, and future green and digital skills requirements.
- **D7. Curriculum Quality, Review & Continuous Improvement:** Processes for monitoring, evaluating, reviewing, and continuously improving curriculum integration, learner outcomes, and responsiveness to societal and labour market changes.

Scoring key for the needs & curriculum integration:

- | | |
|--|---|
| <p>1</p> <p>Emerging (initial) –
Green and digital skills appear occasionally but are not systematically embedded.</p> | <p>2</p> <p>Developing –
Integration exists in some areas but remains inconsistent.</p> |
| <p>3</p> <p>Established –
Green and digital competences are embedded across most curriculum elements.</p> | <p>4</p> <p>Transformative –
Integration is systematic, continuously improved, future-oriented, and recognised as good practice..</p> |

Process

Tool A guides users through a structured review of the seven curriculum dimensions to assess current integration of green and digital competences. By analysing evidence, stakeholder needs, strengths, and gaps, institutions can identify priority areas for improvement and establish a clear foundation for curriculum enhancement, implementation, and monitoring.

Ref	Indicator	Score (1–4)	Evidence / notes
D1 · Strategic Curriculum Alignment			
1.1	Sustainability and digital transition priorities are reflected in curriculum planning and programme development.		
1.2	GreenComp and DigComp are considered during curriculum review and design processes.		
1.3	Curriculum priorities align with institutional sustainability and digital transformation objectives.		
1.4	Curriculum review processes include sustainability, digitalisation, and future skills considerations.		
<i>Dimension average (D1) – carry to Tool C</i>			
D2 · GreenComp & Digital Learning Outcomes			
2.1	Sustainability competences are explicitly included in programme or module learning outcomes.		
2.2	Digital competences are explicitly included in programme or module learning outcomes.		
2.3	Learning outcomes address current and emerging labour market requirements.		
2.4	Learning outcomes support responsible, ethical, and sustainable professional practice.		
<i>Dimension average (D2) – carry to Tool C</i>			
D3 · Green & Digital Teaching Content			
3.1	Sustainability topics are embedded across curriculum content and learning materials.		
3.2	Digital technologies and tools are integrated into teaching and learning activities		
3.3	Curriculum content reflects current sustainability and digital transition challenges.		
3.4	Learning materials are regularly updated to reflect industry developments and emerging trends.		
<i>Dimension average (D3) – carry to Tool C</i>			

Ref	Indicator	Score (1–4)	Evidence / notes
D4 · Sustainable Pedagogy & Learning Experiences			
4.1	Project-based or challenge-based learning approaches are used.		
4.2	Learners engage with real-world sustainability and digital challenges.		
4.3	Interdisciplinary collaboration and problem-solving are encouraged.		
4.4	Teaching approaches actively support sustainability and digital competence development.		
<i>Dimension average (D4) – carry to Tool C</i>			
D5 · Competence Assessment & Recognition			
5.1	Sustainability competences are explicitly assessed.		
5.2	Digital competences are explicitly assessed.		
5.3	Assessment methods reflect authentic workplace or real-life contexts.		
5.4	Learner achievements in sustainability and digital competence development are recognised and documented.		
<i>Dimension average (D5) – carry to Tool C</i>			
D6 · Industry, Entrepreneurship & Future Skills Relevance			
6.1	Employers and industry partners contribute to curriculum design or review.		
6.2	Curriculum reflects current and emerging green and digital skills requirements.		
6.3	Entrepreneurship, innovation, and opportunity recognition are integrated where relevant.		
6.4	Work-based learning and industry engagement support competence development.		
<i>Dimension average (D6) – carry to Tool C</i>			

Ref	Indicator	Score (1–4)	Evidence / notes
D7 · Curriculum Quality, Review & Continuous Improvement			
7.1	Curriculum integration of green and digital competences is reviewed regularly.		
7.2	Learner feedback informs curriculum enhancement decisions.		
7.3	Employer and stakeholder feedback informs curriculum improvement.		
7.4	Improvement actions are monitored and evaluated for effectiveness.		
<i>Dimension average (D7) – carry to Tool C</i>			

For each indicator, review available evidence, discuss strengths and areas for improvement, and assign a score between 1 (Emerging) and 4 (Transformative). Record supporting evidence or observations in the notes column. At the end of each dimension, calculate the average score and transfer the results to Tool C to support action planning and monitoring.

Overall Assessment Summary

After completing all dimensions:

Calculate the average score for each dimension.

Identify key strengths and examples of good practice.

Highlight priority curriculum gaps.

Identify priority enhancement actions.

Determine the institution's overall level of green and digital skills integration.

Transfer key findings to Tool B: Curriculum Design & Enhancement Canvas and Tool C: Curriculum Action Plan & Monitoring Tracker.

The results provide an evidence-based foundation for curriculum enhancement and support continuous improvement towards a fully integrated green and digital curriculum.

Additional Analysis Guidance

This assessment matrix is designed to provide an overall institutional profile of green and digital skills integration across the curriculum. However, the quality and usefulness of the assessment will be significantly strengthened if the review is conducted at multiple curriculum levels.

Institutions are encouraged to apply the matrix not only at institutional level, but also when reviewing individual study programmes, qualifications, modules, units, learning activities, and assessment tasks. This allows teams to identify both systemic strengths and specific areas requiring improvement.

For example, a programme may demonstrate strong curriculum alignment and learning outcomes overall, while individual modules or assessments may reveal important gaps in sustainability or digital competence development.

Where possible, compare findings across programmes and qualification areas to identify good practice, inconsistencies, and opportunities for curriculum enhancement. The overall institutional assessment should therefore be informed by evidence gathered from different curriculum levels, providing a more accurate picture of how green and digital competences are embedded throughout the learner journey.

Tool A

Needs & Curriculum Integration Assessment Matrix

Dimension	Current Level (1-4)	Evidence	Stakeholder Needs	Strengths	Gaps / Improvement	Priority (H/M/L)	Recommended Actions
D1. Strategic Curriculum Alignment							
D2. GreenComp & Digital Learning Outcomes							
D3. Green & Digital Teaching Content							
D4. Sustainable Pedagogy & Learning Experiences							
D5. Competence Assessment & Recognition							
D6. Industry, Entrepreneurship & Future Skills Relevance							
D7. Curriculum Quality, Review & Continuous Improvement							

Additional Needs Analysis

Learner Needs

- What green and digital competences will learners require in future employment?
- Which learner groups may require additional support?

Key Findings: _____

Employer & Industry Needs

- What emerging green and digital skills are employers seeking?
- Which occupations and sectors are changing most rapidly?

Key Findings: _____

Policy & Strategic Drivers

- Which national, regional, or European policies influence curriculum priorities?
- Are GreenComp and DigComp competences sufficiently represented?

Key Findings: _____

Future Skills & Innovation

- Which new competences may become important during the next 3-5 years?
- How effectively does the curriculum support adaptability, innovation, and lifelong learning?

Key Findings: _____

Assessment Summary

Key Priority Needs

1. _____
2. _____
3. _____

Key Curriculum Strengths

1. _____
2. _____
3. _____

Priority Curriculum Gaps

1. _____
2. _____
3. _____

Priority Enhancement Areas

1. _____
2. _____
3. _____

Recommended Priorities for Tool B (Curriculum Design & Enhancement Canvas)

1. _____
2. _____
3. _____

Recommended Priorities for Tool C (Curriculum Action Plan & Monitoring Tracker)

1. _____
2. _____
3. _____

Overall Curriculum Integration Profile

☐ Emerging

☐ Developing

☐ Integrated

☐ Transformative

Evidence supporting the overall rating:

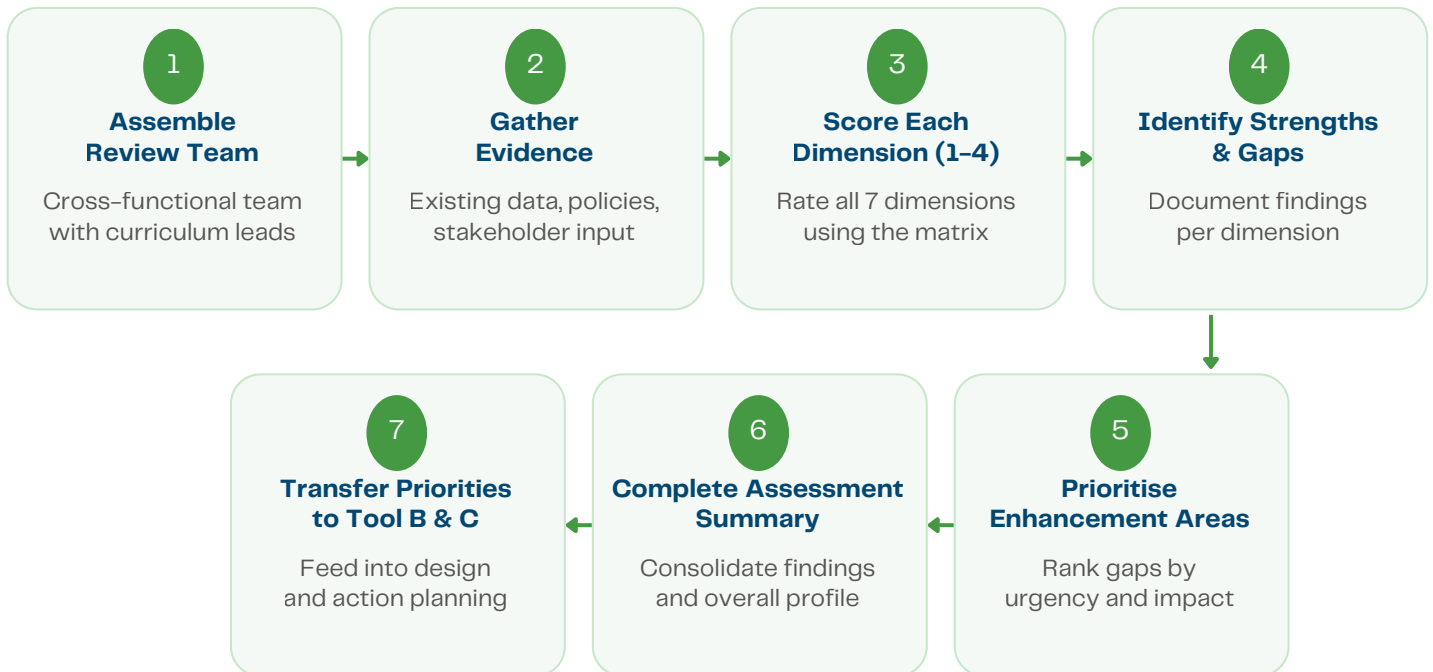
Recommended assessment approach:

Task / Activity → Unit → Module → Programme / Qualification → Institutional Overview

This multi-level review helps ensure that curriculum integration is not only reflected in strategic documentation, but is also visible in day-to-day teaching, learning, and assessment practices.

Tool A: Needs & Curriculum Integration Assessment Matrix

Action Sequence



Process

The review team gathers evidence from curriculum documents, stakeholder consultations, and institutional data. Each of the 7 dimensions is scored using the 1–4 maturity scale. Strengths and gaps are documented, priorities are identified, and findings are transferred to Tool B (Curriculum Design Canvas) and Tool C (Action Plan & Monitoring Tracker) for implementation.



Suggested Duration

4–8 hours across multiple sessions. Can be completed as a structured workshop or distributed review over 1–2 weeks.



Main Output

A scored assessment matrix with identified strengths, gaps, and prioritised enhancement areas feeding directly into Tool B and Tool C.

Tool B

Curriculum Design & Enhancement Canvas

Instructions: Select a programme, module, qualification, or curriculum area identified as a priority through Tool A. Use the canvas to design improvements that align with GreenComp, DigComp, institutional sustainability goals, and labour market needs.

Canvas Element	Guiding Questions	Key Decisions / Design Notes
Programme / Module	Which programme, qualification, or module is being reviewed?	
Identified Need or Gap	What priority need, curriculum gap, or opportunity was identified through Tool A?	
Sustainability Challenge	Which sustainability issue or challenge is being addressed?	
Digital Opportunity	Which digital technologies or competences support the response?	
Target Learners	Who will benefit from the enhancement?	
GreenComp Competences	Which sustainability competences will be strengthened?	
DigComp Competences	Which digital competences will be strengthened?	
Learning Outcomes	What should learners know, understand, and be able to do?	
Curriculum Content	What new or revised topics, themes, or resources should be included?	
Teaching & Learning Approaches	How will learners develop these competences?	
Assessment Strategy	How will learner achievement be assessed?	
Industry & Workplace Relevance	How will the curriculum reflect employer needs, workplace practices, or future skills requirements?	
Entrepreneurship & Innovation Opportunities	How will learners develop initiative, innovation, creativity, or entrepreneurial thinking?	
Stakeholder Contributions	Who should contribute to implementation (teachers, learners, employers, partners)?	
Resources Required	What resources, tools, technologies, or professional development are needed?	
Success Indicators	How will success be measured?	
Expected Impact	What change is expected for learners, staff, employers, and the institution?	

Tool B: Curriculum Design & Enhancement Canvas

Suggested Duration

2–4 hours per programme or module reviewed. Can be completed in a workshop or over multiple sessions.

Main Output

A completed Curriculum Design Canvas translating priority needs into practical design solutions for implementation via Tool C.

Action Sequence:



Design Review Questions

Before moving to Tool C, confirm:

- ☐ GreenComp competences are clearly addressed.
- ☐ DigComp competences are clearly addressed.
- ☐ Learning outcomes have been updated.
- ☐ Content reflects sustainability and digital transition priorities.
- ☐ Teaching approaches support active and authentic learning.
- ☐ Assessment methods evaluate competence development.
- ☐ Industry and workplace needs have been considered.
- ☐ Entrepreneurship and innovation opportunities are included where relevant.
- ☐ Required resources and support have been identified.
- ☐ Success indicators have been defined.

Design Summary

Key Curriculum Changes

1. _____
2. _____
3. _____

Recommended Priorities for Tool C

1. _____
2. _____
3. _____

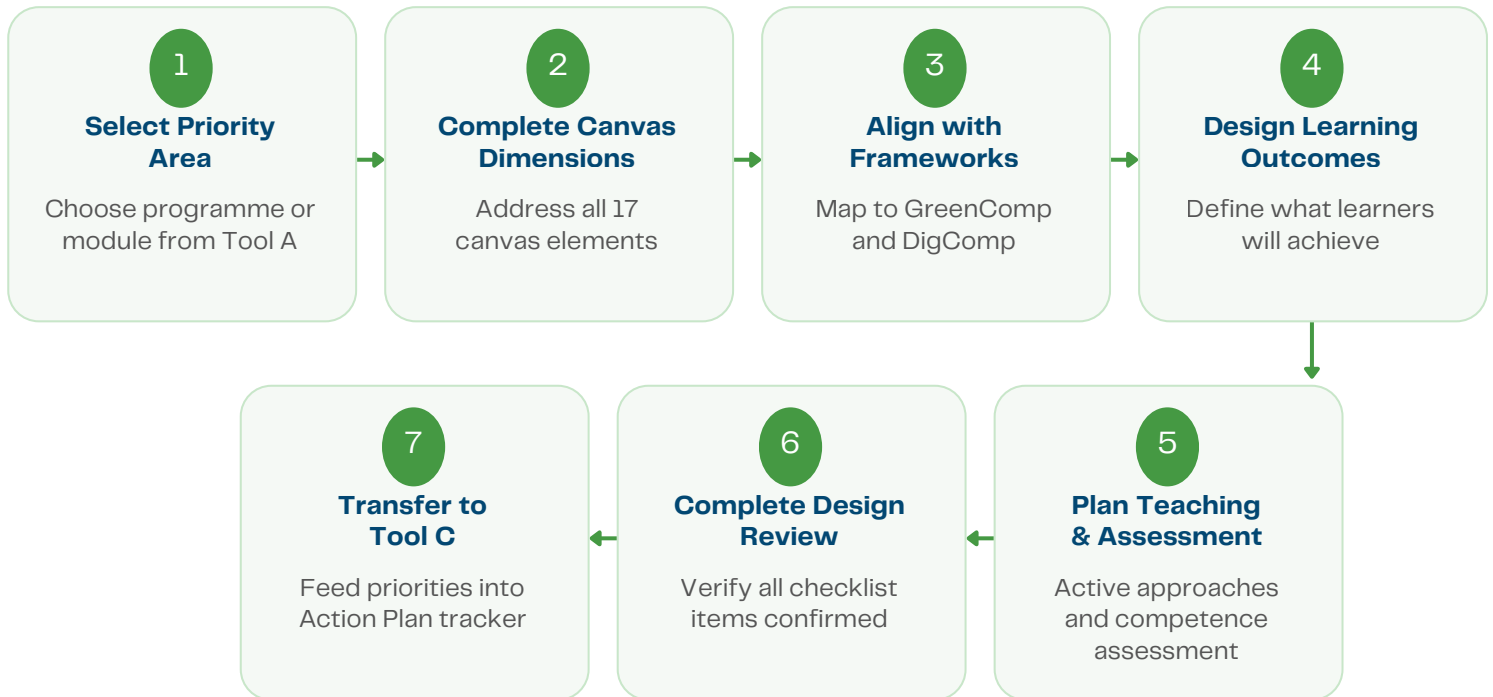
Key Stakeholders Involved

Output

The completed canvas forms the bridge between assessment and implementation by translating priority needs and curriculum gaps into practical curriculum design solutions that can be implemented, monitored, and reviewed through Tool C: Curriculum Action Plan & Monitoring Tracker.

Tool B: Curriculum Design & Enhancement Canvas

Action Sequence



Process

Following completion of Tool A, the review team selects a priority programme or module and systematically completes all canvas dimensions. The design is aligned with GreenComp and DigComp frameworks, learning outcomes are defined, and teaching and assessment strategies are planned. A design review confirms readiness, and priorities are transferred to Tool C for implementation.



Suggested Duration

2–4 hours per programme or module reviewed. Can be completed in a workshop or over multiple sessions.



Main Output

A completed Curriculum Design Canvas translating priority needs into practical design solutions for implementation via Tool C: Action Plan & Monitoring Tracker.

Tool C

Stakeholder Action Plan and Monitoring Tracker

Purpose

Tool C helps VET institutions implement, monitor, and continuously improve stakeholder engagement activities. It translates engagement strategies into concrete actions, responsibilities, timelines, and performance measures, ensuring that stakeholder contributions support the institution's sustainability and digital transition goals.

Action Sequence



Process

Following completion of Tool B, engagement activities are recorded in the tracker, with clear responsibilities, timelines, and success indicators. Progress is reviewed regularly, outcomes are documented, and lessons learned are used to improve future engagement activities.



Suggested Duration

Ongoing throughout the stakeholder engagement cycle, with quarterly or semester-based reviews.



Main Output

A monitored stakeholder action plan that tracks implementation, measures engagement outcomes, and supports continuous improvement of stakeholder relationships and sustainability initiatives.

Use the priorities identified through the Needs & Curriculum Integration Assessment Matrix (Tool A) and the Curriculum Design & Enhancement Canvas (Tool B) to develop a practical implementation plan.

For each action, identify responsibilities, timelines, required resources, success indicators, and monitoring arrangements.

Tool C: Curriculum Action Plan

Priority Area	Action to be Taken	Responsible Person(s)	Timeline	Resources Required	Success Indicators	Status
						☐ Not Started ☐ In Progress ☐ Completed
						☐ Not Started ☐ In Progress ☐ Completed
						☐ Not Started ☐ In Progress ☐ Completed
						☐ Not Started ☐ In Progress ☐ Completed

Monitoring & Evaluation Tracker

Monitoring Area	Evidence to be Collected	Data Source	Frequency	Responsible Person(s)	Findings / Progress Notes
Learning outcomes updated					
Curriculum content revised					
GreenComp competences integrated					
DigComp competences integrated					
Assessment practices improved					
Employer engagement strengthened					
Entrepreneurship integration enhanced					
Learner outcomes improved					

Suggested Indicators for Monitoring Curriculum Integration

1

What Are Indicators?

Specific, observable measures that track progress in integrating sustainability and digital competences into curriculum.

2

How to Use Them

Select indicators relevant to your action plan. Use them in Success Indicators and Monitoring columns. Track at agreed intervals.

3

How to Select

Choose indicators that are: relevant, measurable with available data, realistic, and aligned with institutional sustainability goals.

4

How to Define a Measure

Specify: what is measured, data source, baseline (current value), target (desired value), and timeframe for achievement.

Category	Possible Indicators
1. Strategic Curriculum Alignment	• Programmes reviewed against sustainability objectives • Programmes reviewed against GreenComp • Programmes reviewed against DigComp • Curriculum review processes updated • Sustainability and digital priorities embedded in curriculum plans
2. Learning Outcomes	• Learning outcomes revised • Sustainability competences added to learning outcomes • Digital competences added to learning outcomes • Learning outcomes aligned with labour market needs • Number of programmes with updated competence-based outcomes
3. Teaching Content	• Modules revised or updated • Sustainability topics integrated into modules • Digital technologies integrated into teaching materials • New learning resources developed • Industry-relevant content incorporated
4. Pedagogy & Learning Experiences	• Project-based learning activities introduced • Challenge-based learning activities introduced • Interdisciplinary learning activities implemented • Real-world sustainability projects completed • Learner participation in sustainability-related activities
5. Assessment & Recognition	• Sustainability competences assessed • Digital competences assessed • Authentic assessment methods introduced • Work-based assessment tasks implemented • Digital portfolios or competence evidence introduced
6. Industry, Entrepreneurship & Future Skills	• Employers involved in curriculum review • Industry partnerships established or strengthened • Work-based learning opportunities expanded • Entrepreneurship and innovation activities integrated • Future skills requirements reflected in curriculum updates
7. Curriculum Quality & Continuous Improvement	• Curriculum reviews completed • Learner feedback collected and analysed • Employer feedback collected and analysed • Improvement actions completed • Curriculum enhancement plans updated
8. Learner Impact Indicators	• Improved sustainability competences • Improved digital competences • Improved employability skills • Improved problem-solving skills • Improved innovation and entrepreneurship skills • Increased learner confidence in green and digital practices • Increased learner engagement
9. Institutional Impact Indicators	• Increased GreenComp integration • Increased DigComp integration • Stronger curriculum quality • Stronger employer engagement • Better alignment with sustainability roadmap • Improved readiness for green and digital transition • Increased recognition of good practice

Review & Reflection

What has been successfully implemented?

What challenges were encountered?

What adjustments are required?

What examples of good practice emerged?

Outcome Assessment

Impact on Learners

- ☐ Improved sustainability competences
- ☐ Improved digital competences
- ☐ Improved employability skills
- ☐ Improved problem-solving and innovation skills
- ☐ Improved entrepreneurial competences

Evidence:

Impact on Curriculum Quality

- ☐ Learning outcomes strengthened
- ☐ Content updated
- ☐ Assessment enhanced
- ☐ Industry relevance increased
- ☐ Greater GreenComp integration
- ☐ Greater DigComp integration

Evidence:

Impact on Institutional Sustainability Goals

- ☐ Supports Sustainability Roadmap
- ☐ Supports Green & Digital Transition
- ☐ Strengthens stakeholder engagement
- ☐ Supports work-based learning
- ☐ Supports entrepreneurship and innovation

Evidence:

Next Review Cycle

Review Date: _____

Lead Reviewer: _____

Stakeholders Involved: _____

Summary of Progress

Key Achievements

1. _____
2. _____
3. _____

Remaining Priorities

1. _____
2. _____
3. _____

Recommendations for Continuous Improvement

1. _____
2. _____
3. _____

Output

The completed tracker provides evidence of curriculum enhancement, monitors progress towards green and digital curriculum integration, and generates inputs for Step 8: Monitoring & Evaluation, Step 9: Communication of Results, and Step 10: Long-Term Sustainability of Actions. It closes the improvement cycle by linking curriculum review, implementation, monitoring, and continuous improvement.

Recommended Tool C Structure

For each action:

Priority Area	Action	Responsible Person	Timeline	Success Indicator(s)	Evidence Source	Status
Learning Outcomes	Revise programme outcomes	Curriculum Team	Sept-Dec	100% of outcomes reviewed	Revised curriculum documents	In Progress

This approach gives institutions flexibility while maintaining consistency across programmes and qualifications.

NOTE: All indicators offered for selection must be measurable in numbers, units, percentages (%), ratios, or other quantifiable measures. Indicators should always allow objective verification of progress.

Example: Applying Tools B and C in a Business Administration Programme

Programme Context

Study Programme: Business Administration | EQF Level: 4 (Upper Secondary VET)

At EQF Level 4, learners are expected to apply broad practical and theoretical knowledge, solve problems in familiar work contexts, and take responsibility for completing tasks independently. Green and digital competences should therefore move beyond awareness and become part of workplace practice and decision-making.

During Tool A, the programme team identified that sustainability and digitalisation were addressed inconsistently across modules. While learners used digital office tools, limited attention was given to sustainable business practices, resource management, digital collaboration, ESG principles, or responsible use of technology.

Example: Tool B Completed – Curriculum Design & Enhancement Canvas

Programme: **Business Administration (EQF 4)**

Canvas Element	Design Decision
Identified Need or Gap	Sustainability and digital competences are not systematically embedded across business subjects.
Sustainability Challenge	Reducing resource consumption and supporting sustainable business operations.
Digital Opportunity	Digital workflows, cloud collaboration, AI-supported administration, and paperless business processes.
GreenComp Competences	Systems thinking, critical thinking, responsible action, and future-oriented thinking.
DigComp Competences	Information management, collaboration, content creation, digital problem-solving.
Learning Outcomes	Learners can propose sustainable and digitally supported improvements to business operations.
Curriculum Content	Sustainable office management, digital workflows, ESG fundamentals, sustainable procurement, data management.
Teaching & Learning	Case studies, simulations, workplace projects, collaborative problem-solving.
Assessment Strategy	Business improvement project and digital portfolio.
Industry Relevance	Developed with employer input on digital administration and sustainability practices.
Entrepreneurship	Learners design innovative solutions to improve business efficiency and sustainability.
Success Indicators	Revised learning outcomes approved; modules updated; new assessment methods introduced.

Example: Curriculum Enhancement at Different Levels

The same curriculum integration process can be applied at different curriculum levels.

Programme Level

Business Administration (EQF 4)

Enhancement Focus: Embedding sustainability and digital competences across all core business and administration modules.

Example Outcome: Learners can analyse organisational processes and recommend sustainable and digitally enabled improvements.

Module Level

Office Administration and Business Operations

Enhancement Focus: Introducing sustainable office management and paperless working practices.

Example Outcome: Learners can organise efficient administrative processes using digital tools while reducing resource consumption.

Assessment: Develop a sustainability improvement plan for an office environment.

Lesson Level

Creating a Sustainable and Paperless Office

Enhancement Focus: Reducing paper consumption through digital solutions.

Example Outcome: Learners can identify opportunities to improve efficiency and sustainability using digital tools.

Activity: Teams analyse an administrative process and redesign it using cloud-based collaboration tools.

Assessment: Presentation and justification of the redesigned process.

Example: Tool C Completed – Curriculum Action Plan & Monitoring Tracker

Priority Area	Action	Responsible Person	Timeline	Success Indicator	Evidence Source
Learning Outcomes	Revise programme outcomes to include sustainability and digital competences.	Programme Coordinator	Sept–Nov	100% of outcomes reviewed and updated.	Approved curriculum documents
Teaching Content	Integrate sustainable business practices and digital workflows into core modules.	Curriculum Team	Oct–Dec	Three modules revised and approved.	Module descriptors
Pedagogy	Introduce project-based learning focused on business sustainability challenges.	Teaching Team	Jan–Feb	Two new projects implemented.	Project briefs and learner portfolios
Assessment	Develop authentic assessment tasks using real business cases and digital tools.	Assessment Coordinator	Jan–Feb	Revised assessment included in all updated modules.	Assessment plans
Industry & Entrepreneurship	Include employer-led workshops and innovation challenges.	WBL Coordinator	Nov–Mar	Two industry partners engaged.	Partnership agreements
Quality Improvement	Collect learner and employer feedback and review results.	Quality Manager	May	Feedback analysed and improvement actions agreed.	Review reports

Interpreting the Results

After completing the assessment matrix, calculate the average score for each dimension and the overall average score across all seven dimensions. The results provide a snapshot of the current level of green and digital skills integration and help identify priority areas for curriculum enhancement.

Band	Overall Avg.	Maturity Level – What it Means	Recommended Strategic Focus
Emerging (Initial)	10–17	Green and digital competences appear occasionally but are not systematically embedded within curriculum design, delivery, assessment, or review processes.	Establish foundations for curriculum integration and identify priority development areas.
Developing	18–25	Green and digital competences are integrated within some programmes, modules, or activities, but implementation remains fragmented and inconsistent.	Strengthen curriculum alignment, expand integration, and build staff capability.
Integrated	26–33	Green and digital competences are embedded across most curriculum elements and are reflected in learning outcomes, teaching, assessment, and learner experiences.	Improve consistency, quality, industry relevance, and evidence of competence development.
Transformative (Strategic)	34–40	Curriculum integration functions as a strategic capability that continuously prepares learners for sustainability and digital transitions and responds to future skills needs.	Scale innovation, share good practice, and strengthen curriculum responsiveness and impact.

Do not focus only on raising scores.

The objective is to move from curriculum alignment (D1) to competence-focused learning outcomes (D2), embedded content (D3), authentic learning experiences (D4), meaningful assessment (D5), industry and entrepreneurship relevance (D6), and finally continuous curriculum improvement (D7).

Institutions achieve the greatest progress when improvement actions target the weakest link in this curriculum integration cycle.

Cross-Dimension Strategic Priorities

Strong Alignment, Weak Delivery

If D1 and D2 score highly but D3–D5 score lower, sustainability and digital priorities may exist in curriculum documents but are not yet visible in teaching and assessment practice.

Strategic focus: Strengthen teaching content, pedagogy, and assessment approaches.

Strong Teaching, Weak Assessment

If D3 and D4 score highly but D5 scores lower, learners may experience sustainability and digital learning without receiving meaningful assessment or recognition.

Strategic focus: Develop competence-based and authentic assessment methods.

Strong Internal Curriculum, Weak External Relevance

If D1–D5 score highly but D6 scores lower, curriculum integration may not sufficiently reflect labour market needs, entrepreneurship, or future skills requirements.

Strategic focus: Strengthen employer engagement, work-based learning, and future skills analysis.

Strong Practice, Weak Improvement Systems

If D1–D6 score highly but D7 scores lower, good practice may exist without effective review and continuous improvement mechanisms.

Strategic focus: Establish systematic monitoring, evaluation, and curriculum review processes.

Additional Cross-Profile Actions

Regardless of overall score, institutions should:

- regularly review learning outcomes against GreenComp and DigComp;
- engage employers and industry partners in curriculum development;
- strengthen authentic, workplace-relevant assessment approaches;
- integrate entrepreneurship and innovation opportunities where appropriate;
- collect learner and employer feedback to support curriculum enhancement; and
- review curriculum integration at programme, module, unit, and learning activity levels.

The assessment should be viewed as a **continuous improvement tool** rather than a compliance exercise. The ultimate goal is to ensure that learners develop the green and digital competences required to contribute effectively to sustainable, innovative, and resilient economies and societies.

8. Quality Checklist

Before declaring Step 5 complete, confirm:

✓	Quality Check Item
☐	Sustainability and digital competences have been mapped across programmes and modules.
☐	Curriculum review has considered GreenComp, DigComp, and relevant qualification requirements.
☐	Learner, employer, and stakeholder needs have informed curriculum decisions.
☐	Learning outcomes have been reviewed and updated where necessary.
☐	Sustainability and digital themes are embedded within curriculum content and learning resources.
☐	Teaching and learning approaches support competence development through active and authentic learning.
☐	Assessment methods evaluate sustainability and digital competences effectively.
☐	Industry, work-based learning, entrepreneurship, and future skills requirements have been considered.
☐	Priority curriculum enhancement actions have been identified and documented.
☐	Roles, responsibilities, timelines, and monitoring arrangements have been agreed.
☐	Curriculum enhancement priorities have been transferred to implementation and quality assurance processes.
☐	A review date has been scheduled for reassessment and continuous improvement.

Go to Step 6 when...

- ✓ A curriculum integration profile has been completed.
- ✓ Priority sustainability and digital competence gaps have been identified.
- ✓ Curriculum enhancement priorities have been agreed by relevant stakeholders.
- ✓ Learning outcomes, content, pedagogy, and assessment requirements have been reviewed.
- ✓ An implementation and monitoring plan is in place.
- ✓ Curriculum priorities are ready to inform entrepreneurship and innovation initiatives in Step 6.

The Green & Digital Curriculum Integration Framework is informed by European sustainability, digital competence, and VET policy frameworks, including the European Green Deal, European Skills Agenda, GreenComp, DigComp, the Council Recommendation on learning for the green transition and sustainable development, and the X-VET Integrated Sustainability Competences Framework.

Its seven dimensions reflect key principles of curriculum quality and competence-based learning: strategic alignment, learning outcomes, teaching content, pedagogy, assessment, industry and entrepreneurship relevance, and continuous improvement. Together, they provide a practical framework for integrating green and digital competences across VET programmes, modules, and learning experiences.



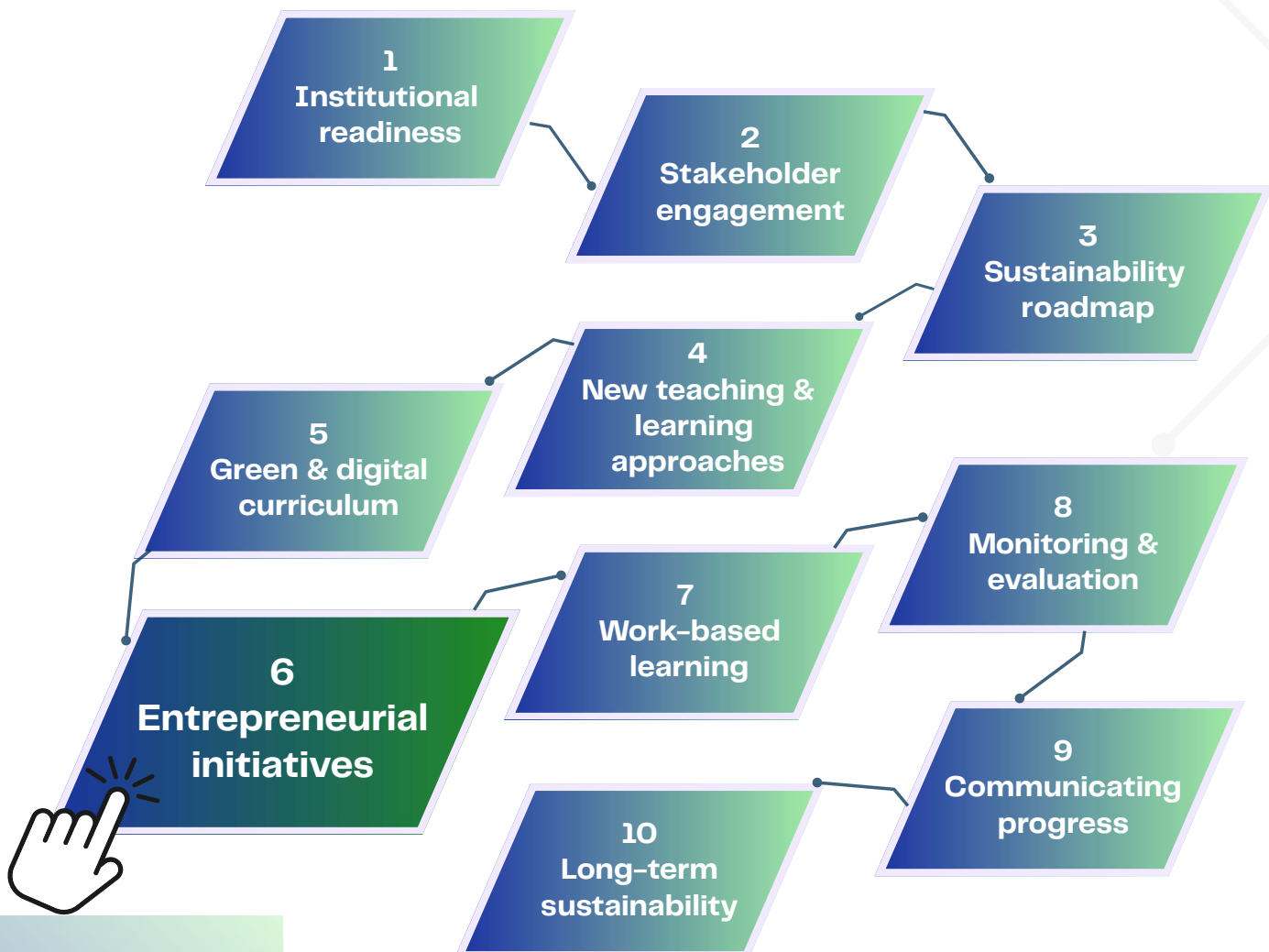
STEP 6 - Entrepreneurial initiatives

1. Purpose of this guide

This guide supports VET institutions in turning sustainability challenges, stakeholder needs and institutional priorities into practical entrepreneurial initiatives that create environmental, social, educational or economic value. It helps institutions connect these initiatives with relevant VET objectives, learner competences and opportunities for cooperation with external partners.

It guides learners, educators and partners in defining the challenge, designing a feasible response, testing it at an appropriate scale and deciding whether the initiative should be improved, implemented, transferred, scaled or stopped. Important assumptions, resource constraints, risks and evidence gaps should be clearly recorded throughout the process.

2. Step 6 within the 10-Step Process Model



How Step 6 draws on the competence framework?

Step 6 is centred on Competence 7: Fostering Sustainable Entrepreneurship and Innovation. It draws directly on Competence 2 for evidence-based challenge framing and on Competence 3 for testing, evaluation and improvement. Depending on the initiative, it may also activate Competences 4, 5, 6, 8, 9 and 10. The process combines experiential learning, stakeholder co-creation, resource planning, ethical reflection and future-oriented thinking. It supports relevant GreenComp competences, including problem framing, systems thinking, exploratory thinking, collective action, individual initiative and adaptability. It also supports EntreComp competences such as spotting opportunities, creativity, valuing ideas, mobilising resources, financial and economic literacy, planning and management, working with others and learning through experience

3. Why Entrepreneurial Sustainability Initiatives Matter in VET

Sustainability learning should enable learners to act on real challenges, not only understand them in theory. Entrepreneurial learning supports this by helping learners identify opportunities, develop ideas, mobilise resources, work with others and create value. This value may be environmental, social, cultural, educational or economic and does not require the creation of a business (Bacigalupo, M. and O'Keeffe, W., 2018).

In VET, practical initiatives connect sustainability competences with vocational knowledge, workplace challenges and community needs. They allow learners to test solutions, learn from results and improve their ideas through experience. This combines GreenComp's focus on collective action and individual initiative with the X-VET emphasis on experiential, challenge-based learning and cooperation with industry.

4. What Is an Entrepreneurial Sustainability Initiative?

An entrepreneurial sustainability initiative is a planned and testable response to a sustainability challenge or opportunity. It creates identifiable value for others and gives learners and partners a meaningful opportunity to act, test assumptions and learn from evidence. The value may be environmental; social, cultural or inclusion-related; educational; organisational; or economic. Digital technology may support the initiative, but its benefits, risks and environmental implications must be assessed rather than assumed.

EntreComp defines entrepreneurship as acting on ideas and opportunities to create value. This can take place in education, workplaces, communities, public institutions or businesses and does not require the creation of a commercial venture.

Type of initiative	Example
Learning initiative	Learners redesign a vocational task to reduce waste or energy use
Institutional initiative	A repair, reuse or resource-sharing system within the VET institution
Community initiative	A service responding to a local environmental or social need
Workplace initiative	A resource-efficiency pilot developed with an employer
Digital initiative	A tool for monitoring energy, materials, waste or sustainable practices
Social enterprise concept	A product or service designed to create social and environmental value
Hackathon solution	A prototype developed through a time-limited sustainability challenge

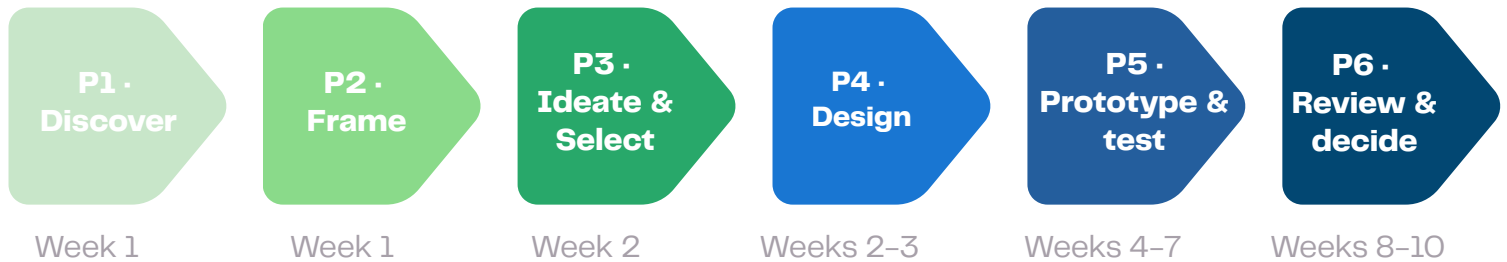
An initiative does not need to become a business. It should address an identifiable need, create value and provide participants with a meaningful opportunity to take action and learn from experience.

5. Initiative Design Building Blocks

Building block	Guiding question
Challenge or opportunity	What specific sustainability issue or opportunity should be addressed?
Evidence and baseline	What evidence shows that the issue matters, and what is the current situation?
Stakeholder validation	Which affected groups confirmed that the issue is relevant, and how were their views collected?
Alternative ideas and selection	Which possible responses were considered, and why was one selected?
Value to be created	What environmental, social, cultural, inclusion, educational, organisational or economic value could result?
Target users or beneficiaries	Who should benefit, participate or experience the change?
Proposed solution	What will be developed, changed or tested?
Competences and learning outcomes	What should learners and other participants know, understand or be able to do?
Partners and roles	Who should contribute to design, testing, implementation or evaluation?
Resources and viability	What time, funding, equipment, facilities, data and external support are required?
Prototype or minimum test	What is the smallest useful version that can be tested under realistic conditions?
Success criteria and evidence	How will feasibility, learning and observable value be assessed?
Risks, ethics and inclusion	What possible harm, exclusion, safety issue or misleading sustainability claim should be prevented?
Ownership and continuity	Who will own, maintain, finance or update the initiative after testing?
Next-step decision	Should the initiative be improved, implemented, transferred, integrated into work-based learning, scaled, paused or stopped?

6. A Six-Phase Initiative Pathway

Entrepreneurial sustainability initiatives can be developed through six practical phases. Institutions may adapt the timing and scale, but the process should move from an evidence-based challenge to testing and a justified next-step decision.



Phase 1 - Discover (week 1)

Identify a real sustainability challenge or opportunity using available evidence from the Roadmap, curriculum priorities, stakeholder input, workplace needs or institutional practice. Describe the current situation, who is affected and why the issue matters. Record the initial challenge and supporting evidence in Tool A.

Phase 2 - Frame (week 1)

Clarify the affected groups, their needs, the main causes and the boundaries of the challenge. Consider the green, digital and economic dimensions, as well as available assets, constraints and risks. Use Tool A to produce a focused and validated challenge statement that is open to more than one possible solution.

Phase 3 - Ideate & select (week 2)

Generate several possible responses rather than moving immediately to the first proposed solution. Compare the ideas according to the value they could create, their relevance to the challenge, feasibility, resource needs and stakeholder support. Select the most promising initiative concept for further development in Tool B.

Phase 4 - Design (weeks 2-3)

Develop the selected concept into a practical initiative by defining the proposed solution, target users, expected value, learning outcomes, roles, resources, milestones and success criteria. Identify a minimum testable version and review possible ethical, inclusion, safety and sustainability risks. Consolidate the design in the completed Tool B Initiative Canvas.

Phase 5 - Prototype & test (weeks 4-7)

Develop a manageable prototype or pilot that is realistic enough to test with learners, users or relevant partners. Use Tool C to plan the test, assign responsibilities, collect evidence and document participant feedback, learning and unintended effects. The output should be a clear record of what worked, what did not and what observable value or early evidence of potential value emerged.

Phase 6 - Review & decide (weeks 8-10)

Assess the test results against the initiative's success criteria and stakeholder feedback. Decide whether the initiative should be improved and tested again, implemented, transferred, integrated into work-based learning, scaled, paused or stopped. Record the decision, supporting evidence, required changes, responsibilities and next review date in Tool C.

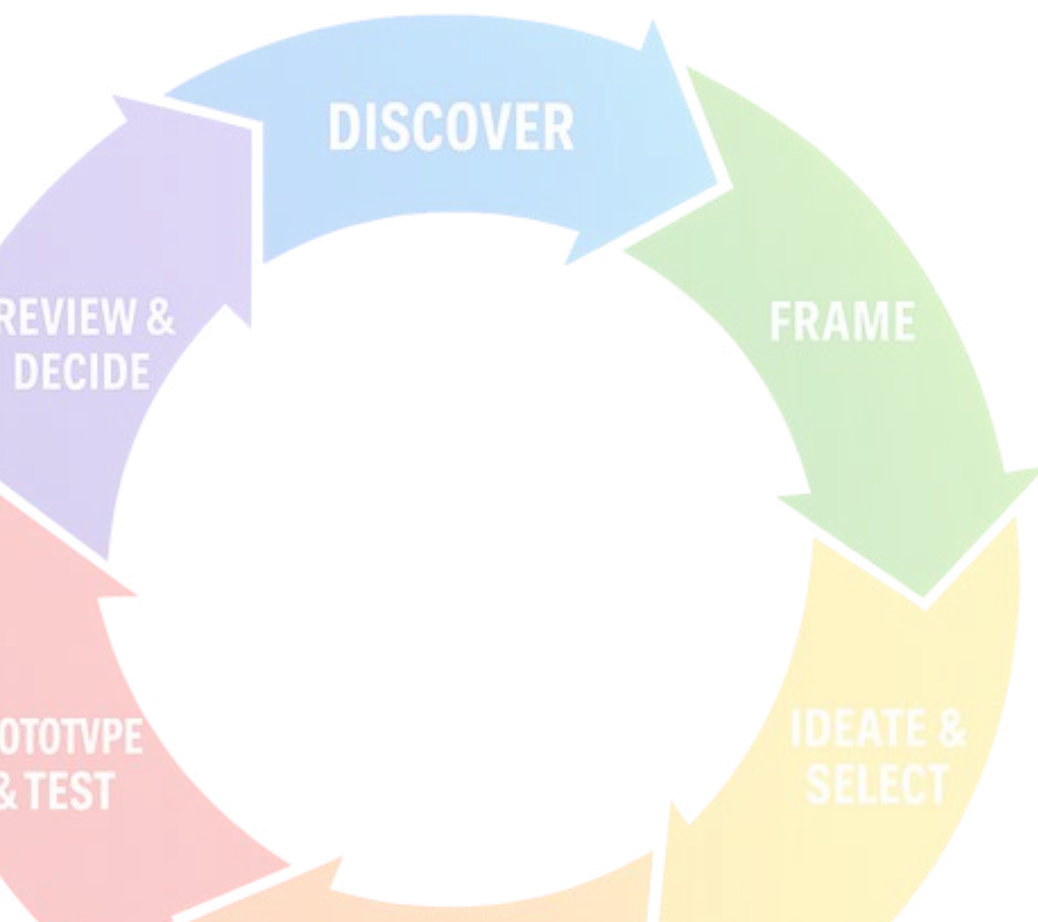
Relationship with the X-VET Sustainability Hackathon Guide

Step 6 provides the general process for identifying, designing, testing and reviewing entrepreneurial sustainability initiatives. A hackathon is one possible delivery format. Detailed guidance on event planning, facilitation, mentoring, judging, digital tools, team organisation and post-hackathon follow-up is provided in the separate X-VET Sustainability Hackathon Guide developed in WP4.

A short hackathon may produce an initial prototype. It should not be presented as evidence of long-term environmental, educational, social or economic impact without subsequent testing.

The pathway should remain proportionate to the initiative. A short hackathon may complete several phases within one or two days, while an institutional or workplace pilot may require several weeks.

Important assumptions, risks and stakeholder concerns should remain visible throughout the process. Testing should be used to learn and improve, not only to confirm the original idea.



Tool A

Sustainability Challenge and Opportunity Canvas

Purpose

Use this tool to define a clear, evidence-based sustainability challenge or opportunity before developing possible solutions. The challenge may come from the Sustainability Roadmap, stakeholder input, curriculum priorities, workplace needs or institutional practice.

How to use the tool:



- Describe the current situation and establish an initial baseline.
- Identify affected groups, beneficiaries and other relevant stakeholders.
- Validate the challenge through stakeholder input, observation or available data.
- Examine causes, transition dimensions, constraints, assumptions and evidence gaps.
- Formulate a focused challenge statement that remains open to several possible solutions.

Canvas element	Response
Challenge or opportunity	What issue or opportunity has been identified?
Source of evidence	What data, observations, documents or stakeholder input show that it matters?
Baseline or current situation	What is happening now? Include an initial value or description where possible.
Affected groups and beneficiaries	Who experiences the challenge, who could benefit and who may carry additional costs or work?
Stakeholder validation	Who was consulted, how were their views collected and what did they confirm or challenge?
Causes and contributing factors	Why does the situation exist?
Green, digital and economic dimensions	Which transition strands and interdependencies are involved?
Relevant Roadmap or curriculum priority	Which previously approved priority does the initiative support?
Available assets and strengths	Which competences, partnerships, facilities, data or resources can be used?
Main constraints and risks	What may limit the initiative or create negative effects?
Evidence gaps and assumptions	What is not yet known, and which assumptions need to be tested?
Challenge statement	What specific issue should the initiative address?

Before proceeding, confirm that the challenge is specific, supported by evidence and open to more than one possible solution.

Tool A Output

A clear and evidence-based sustainability challenge or opportunity ready for idea generation and initiative design.

Tool B

Sustainable Value and Initiative Canvas

Purpose

Use this tool to generate and compare several possible responses, select the most promising initiative concept and develop it into a practical and testable initiative.

Complete one Tool B for each challenge taken forward from Tool A.

A. Idea Generation and Selection

Criterion	Idea 1	Idea 2	Idea 3
Short description			
Expected sustainability value			
Relevance to stakeholder needs			
Feasibility within available time and resources			
Economic and organisational viability			
Learning and competence-development value			
Stakeholder or partner support			
Main risks and trade-offs			

Selection element	Response
Selected idea	Which idea will be developed?
Reason for selection	Why is this idea more appropriate than the alternatives?
Ideas parked or rejected	Which ideas will not be developed now, and why?
Key assumptions to test	What must be confirmed during prototyping and testing?

B. Initiative Concept

Element	Guiding question
Initiative title	What is the working title of the initiative?
Challenge addressed	Which challenge or opportunity from Tool A does it address?
Target users or beneficiaries	Who should benefit, participate or experience the change?
Proposed solution	What will be developed, changed or tested?
Stakeholder role	How will affected groups participate in design, testing or evaluation?

C. Value and Learning

Value area	Intended contribution
Environmental value	What environmental improvement could result, and how could it be observed?
Social, cultural and inclusion value	How could learners, staff, workplaces or communities benefit? Could any group be disadvantaged?
Educational and competence-development value	What should participants learn or become able to do?
Organisational and economic value	What efficiency, resilience, savings, avoided costs, income or other organisational benefit could result?
Digital contribution and implications	How could digital tools support the initiative, and what access, data, safety, ethical or environmental risks should be considered?

Learning element	Response
Relevant VET competences	Which vocational and transversal competences will be developed?
Learning outcomes	What should participants know, understand or be able to do after the initiative?
Evidence of learning	How will competence development be observed or documented?

D. Implementation and Viability

Element	Guiding question
Main activities and milestones	What needs to be done, and by when?
Roles and responsibilities	Who will lead, contribute, advise, test and approve?
Start-up resources and costs	What staff time, funding, equipment, materials, data or facilities are required to begin?
Operating and maintenance requirements	What resources will be required if the initiative continues?
Funding, savings or avoided costs	How could the initiative be financed, and could it generate savings, income or avoided costs?
Minimum testable initiative	What is the smallest useful version that can be tested under realistic conditions?
Long-term owner	Who will be responsible for maintaining or updating the initiative?
Conditions for continuation	What must be available for the initiative to continue after the pilot?

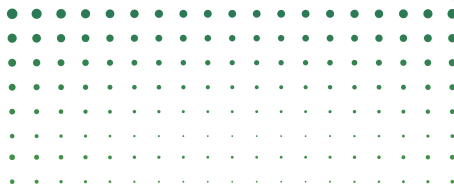
E. Evidence and Safeguards

Element	Guiding question
Baseline or reference point	Against what current situation will the test results be compared?
Success criteria and evidence	What evidence would show that the initiative is feasible, supports learning and creates observable value?
Risks and mitigation	What ethical, inclusion, safety, digital, environmental or greenwashing risks may arise, and how will they be addressed?
Ownership, data and permissions	Who owns the outputs and data? Are permissions, licences or agreements required?
Evidence limitations	What will the pilot not be able to prove?

Not every initiative needs to create all forms of value equally. Teams should nevertheless consider benefits, costs, trade-offs and possible unintended effects before testing.

Tool B Output

A selected and justified initiative concept supported by stakeholder relevance, expected value, learning outcomes, implementation arrangements, basic viability analysis, safeguards and a minimum testable version.



Tool C

Prototype, Test and Next-Step Planner

Purpose

Use this tool to plan a limited test, collect evidence and decide what should happen next.

The test should be small enough to manage, but realistic enough to show whether the initiative is useful, feasible and capable of creating value.

C1. Prototype and Test Plan

Test element	Details
What will be tested?	Which part of the initiative will be prototyped or piloted?
Test participants	Who will use, observe or contribute to the test?
Baseline or reference point	What is the current situation against which results will be compared?
Location and timing	Where and when will the test take place?
Responsible person or team	Who will coordinate the test?
Required resources	What time, equipment, materials, funding, data or support is needed?
Success criteria	What observable results would indicate that the initiative is useful, feasible and educationally valuable?
Evidence collection	How will results, feedback, learning and unintended effects be recorded?
Safety, ethics, inclusion and digital checks	What precautions are required before testing?

C2. Test Results

Review question	Findings
What worked well?	Which activities, features or arrangements produced the intended results, and what evidence supports this finding?
What did not work as expected?	Which results differed from expectations, and what evidence or feedback shows this?
What observable value or early evidence of potential value emerged?	What environmental, social, cultural, inclusion-related, educational, organisational or economic value was observed, for whom, and based on what evidence?
What did participants learn?	What knowledge, skills, attitudes or competences did participants develop, and how was this observed or documented?
What stakeholder feedback was received?	Who provided feedback, what were the main messages, and where did stakeholder views agree or differ?
What unintended positive or negative effects appeared?	What unexpected effects occurred, who was affected, and how significant were they?
What remains uncertain?	Which assumptions or questions could not yet be confirmed, and what further evidence is needed?
What evidence limitations should be recorded?	What limitations related to the test duration, participants, baseline, data quality or test conditions affect the interpretation of the results?
What should be changed before continuing?	What changes to the initiative, implementation process, resources, safeguards or test design are required before the next step?

C3. Next-Step Decision

Use the test evidence to select and justify one next step:

- **Improve and test again** – revise the initiative and conduct another test.
- **Implement** – use it in the current context.
- **Transfer** – adapt it to another programme, department or setting.
- **Integrate into work-based learning** – continue it with workplace partners.
- **Scale** – extend it to more learners, programmes or partners.
- **Pause** – continue when missing evidence, resources or conditions are available.
- **Stop** – discontinue it because it is not sufficiently useful, feasible or safe.

Record the selected decision, a short justification, the responsible person or team and the next review date.

Decision element	Response
Selected next step	
Evidence supporting the decision	
Required changes	
Remaining risks or uncertainties	
Resources or conditions required	
Responsible person or team	
Handover destination	
Next review date	

7. Common Initiative Weaknesses and Improvements

Before implementation or wider testing, review the initiative for common weaknesses that may reduce its value or feasibility.

Common weakness	Suggested improvement
Starting with a preferred solution	Investigate and frame the challenge before selecting a response
Unclear value	Specify who should benefit and what should change
No link with institutional priorities	Connect the initiative to an approved Roadmap or curriculum priority
Initiative is too large	Define a smaller prototype or minimum testable version
Learners only follow instructions	Give learners meaningful choices and responsibility
Partners are involved too late	Include affected groups during challenge framing and design
Success is measured only by participation	Assess learning, feasibility and observable value created
Sustainability claims are unsupported	Define evidence and avoid greenwashing
Digital tools are treated as automatically sustainable	Consider access, data, energy use, ethics and lifecycle effects
No decision follows testing	Decide whether to improve, implement, transfer, scale, pause or stop
One idea is selected without comparing alternatives	Generate and compare at least three possible responses and document the selection rationale
Stakeholder need is assumed rather than validated	Consult affected groups and record how their feedback changed or confirmed the challenge
Economic and organisational continuity is unclear	Estimate start-up and operating requirements, identify possible funding or savings and assign a long-term owner
Pilot results are presented as long-term impact	Report observable results and evidence limitations; distinguish pilot findings from demonstrated impact

The initiative should proceed only when the challenge, expected value, participant roles, test method and success criteria are sufficiently clear.

8. Feeding Steps 7-10

The tested initiative should provide practical evidence and outputs for the remaining X-VET steps.

Subsequent step	Information to transfer
Step 7 – Work-Based Learning	Employer challenges, partner roles, workplace testing opportunities and relevant competences
Step 8 – Monitoring and Evaluation	Baseline information, success criteria, indicators, evidence sources and test results
Step 9 – Communicating Progress	Validated outcomes, lessons learned and evidence suitable for communication
Step 10 – Ensuring Long-Term Sustainability	Initiatives recommended for continuation, scaling, resourcing or integration into regular practice

9. Quality checklist

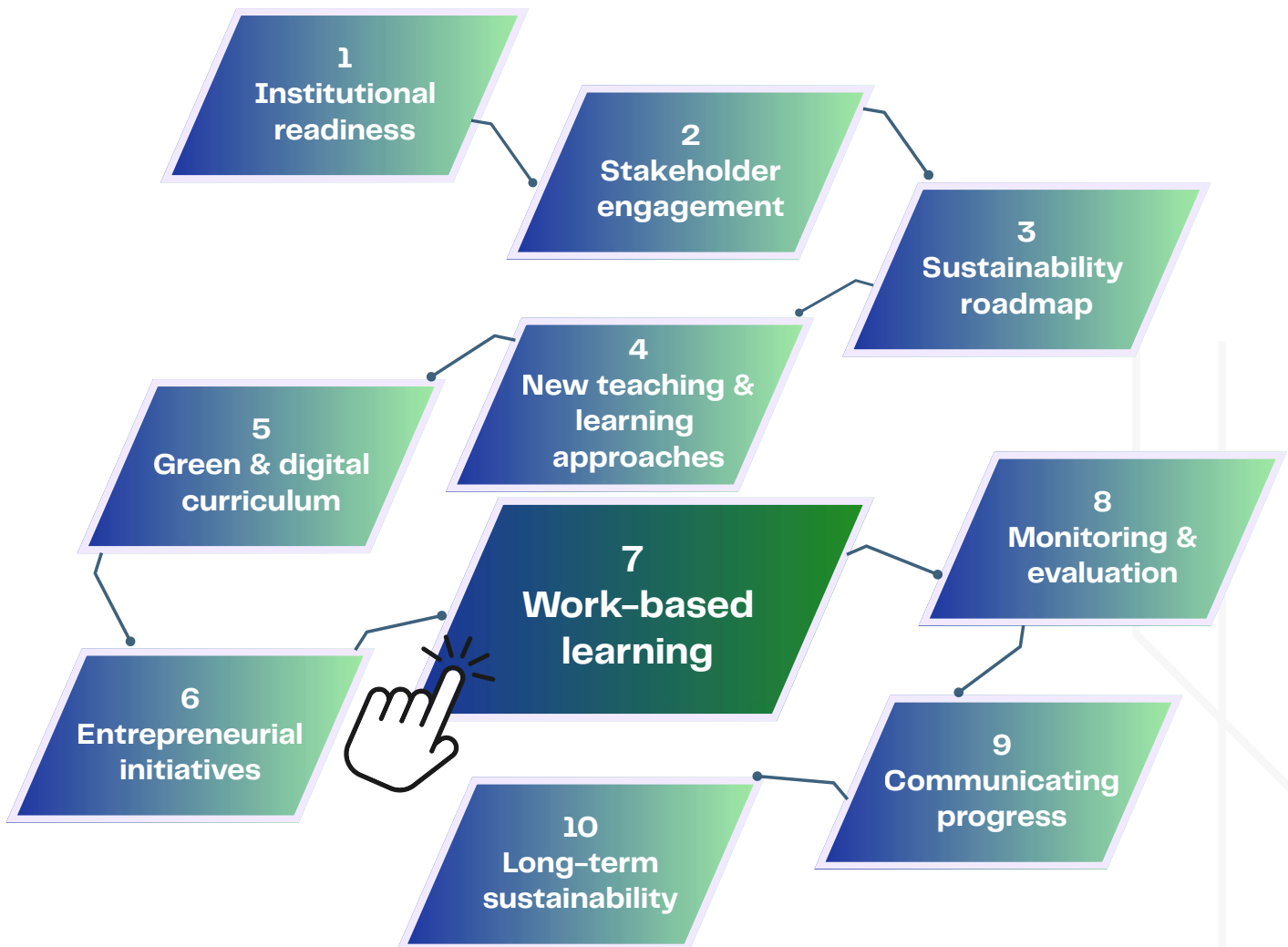
Before declaring Step 6 complete, confirm:

- ☐ the initiative addresses an evidence-based sustainability challenge and supports an institutional or curriculum priority;
- ☐ relevant stakeholders and learners were involved in defining or validating the initiative;
- ☐ alternative ideas were considered and the selected solution is clearly justified; expected sustainability value, learning outcomes and target beneficiaries are defined;
- ☐ activities, responsibilities, resources, basic viability and long-term ownership are clear;
- ☐ a realistic prototype or pilot was tested against defined success criteria;
- ☐ ethical, inclusion, safety, digital and greenwashing risks were reviewed;
- ☐ results, feedback and evidence limitations were documented, leading to a justified next-step decision.



STEP 7 - Work-based learning

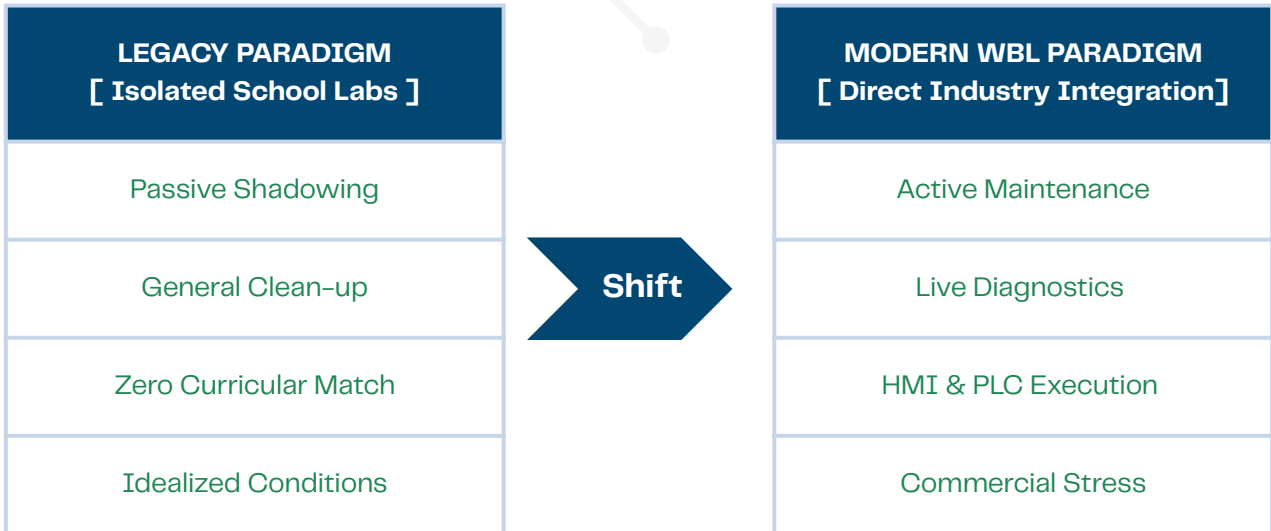
1. Step 1 within the 10-Step Process Model



2.The Modern Shift in Technical Placements

Modern secondary technical education requires a significant shift away from isolated, school-based laboratory work. While foundational principles of automation, electronics, and mechanical systems are taught in institutional workshops, the rapid technological advancements in manufacturing necessitate direct industry experience.

Abstract simulations cannot replicate the physical stresses, equipment interlocks, or real-time diagnostic demands present on an operational production floor. This module establishes a standardized operational framework for implementing Work-Based Learning (WBL) placements, which are subject to both legal and structural audits. By transitioning from observational internships to structured practical engagements, institutions can ensure their curricula remain current.



To address this systemic mismatch, the framework calls for a thorough change in practice, moving away from traditional, passive internships toward work-based learning (WBL) routes that are properly aligned with the curriculum.

Previously, institutional placements often took the form of "site observation tours," during which students had limited opportunities for interaction. They were typically allowed only to watch passively, perform general duties, or carry out simple cleaning tasks, none of which offered measurable educational value.

When students work under real commercial operating conditions, they do not merely memorize theoretical circuit diagrams or the structure of PLC code; instead, they apply diagnostic methods on actual commercial equipment, interpret real-time feedback from sensors through human-machine interfaces (HMIs), and carry out precise calibration procedures within the strict time limits and safety constraints of the plant.

3.Mapping out the Industrial Synergy

A resilient work-based learning program should be seen as a mutual investment rather than a charitable initiative from corporations. To ensure ongoing support from plant owners and corporate boards, technical schools must align their placement programs with clear economic incentives.

For VET Institutions

Zero-Capital Infrastructure Modernization	The institution obtains direct access to multi-million euro machinery, including industrial PLC networks, modern electropneumatic systems, and automated sorting cells, without depleting its capital expenditure budgets.
Elimination of Instructional Obsolescence	Applied technical instructors benefit from ongoing, real-time exposure to current operating parameters, updated software platforms (such as VisiLogic configurations), and safety regulations relevant to competitive regional markets.
Enhanced Institutional Prestige	Graduates of technical programs achieve significantly higher employment rates within high-tech sectors, thereby strengthening the institution's reputation and attracting highly qualified local applicants.

Corporate partners benefit from a tailored

A Highly Customized Engineering Pipeline	The corporate partner establishes a direct and transparent screening channel for local technical talent. Trainees are integrated into the plant's specific internal maintenance methodologies several months prior to formal graduation.
Reduction in Post-Hire Onboarding Costs	Newly hired graduates from a structured work-based learning (WBL) track require no post-hire transition training and are able to operate as fully productive, autonomous employees from their first day.
Optimization of Secondary Maintenance Capacity	Under the supervision of an active floor mentor, advanced student trainees assist with routine preventative maintenance, sensor calibrations, and system monitoring.

4.The Co-Design Protocol

Bridging the Gap Between Classroom Theory and Shop Floor Practice

A major challenge in secondary dual-education systems is the considerable misalignment between academic learning and the practical tasks assigned to students in manufacturing settings.

Without a coordinated placement plan, companies often assign students to trivial, non-technical, or repetitive tasks. These assignments, like manual sorting, general cleaning, or basic packaging, offer no educational benefit and fail to help students develop advanced vocational skills.

To tackle this disconnect, technical institutions and corporate partners need to hold a Curriculum Alignment Workshop at least four weeks before the placement cycle begins. This collaborative session should involve the applied technical instructors from the secondary school and the chief engineering leads from the host company. The goal is to translate classroom learning outcomes into explicit, verified, and safe production tasks on the manufacturing line.

The co-design process will utilize a structured bilateral mapping system. Each theoretical competency outlined in the national vocational curriculum must be matched with a corresponding real-world maintenance or production activity at the facility. If a core curricular outcome cannot be linked to an active industrial process within the host company, it should be identified, and a supplementary school-based laboratory module or software simulation should be scheduled to fill the gap.

Standardizing the Student Training Blueprint

The blueprint must clearly define the engineering boundaries for each assignment. For the mechatronics track, this includes tasks such as diagnosing and isolating automated electrical circuits, overhauling mechanical fluid power actuators, or making configuration changes within a programmable controller network. For the electrotechnics or traffic tracks, it outlines the specific infrastructure, system parameters, or network routing controls that the trainee is authorized to engage with.

5. Establishing quality standards

Before student placement, technical schools must conduct a systematic audit of each potential corporate facility. The facility must meet three strict operational standards during the pre-contractual phase.

TECHNOLOGICAL ARCHITECTURE AUDIT

Would you prefer active automated production lines or digital control systems?
Should we use standard industrial HMIs and electropneumatic networks?

Yes

No

Proceed to HSE Legal Validation

Repetitive Labor Risks

HSE & LEGAL COMPLIANCE AUDIT

Current statutory OHS risk sheets for all cells?
Are active LOTO breaker protocols and PPE floor tracking in place?
Does the third-party liability insurance cover trainees?

Yes

No

Proceed to Mentorship Audit

Without Floor Safety

MENTORSHIP INFRASTRUCTURE AUDIT

Are you a formally appointed senior technician or plant lead?
Do you have a contract that guarantees a weekly block of hours?

Yes

No

FACILITY VALIDATED

REJECTED PARTNERSHIP

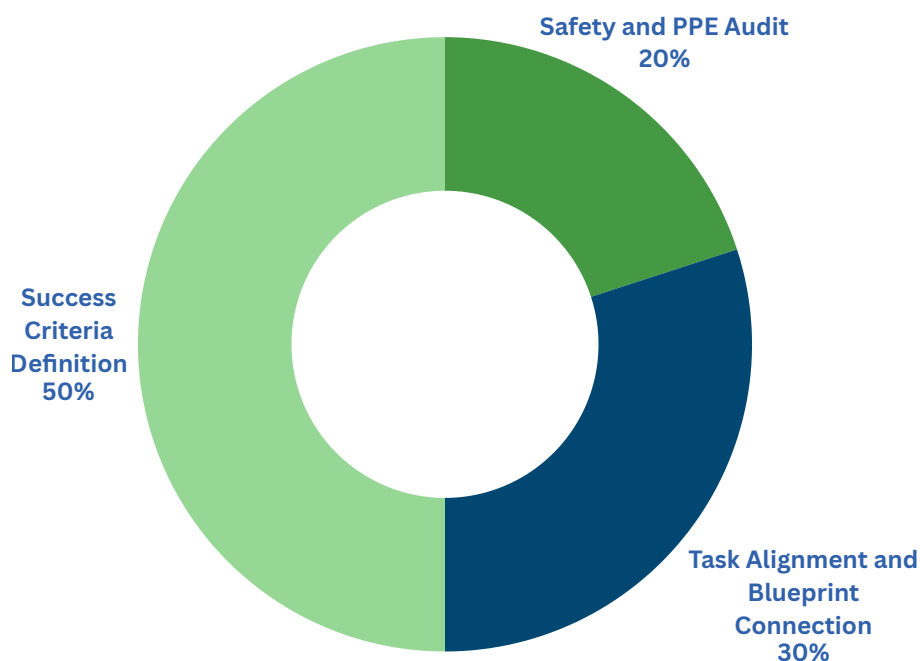
6. Employee mentorship

A common pitfall in secondary dual-education systems is the unexamined belief that seasoned plant engineers, skilled automation technicians, or master maintenance mechanics are inherently effective vocational educators. Being technically proficient on the factory floor does not automatically mean one possesses the teaching skills required to instruct others. An engineer who is skilled at resolving complex signal issues or rebuilding electropneumatic valve blocks may lack the structured communication abilities needed to teach these concepts to secondary technical students effectively.

The 10-Minute Morning Technical Update Protocol

Company mentors are required to conduct a structured operational briefing at the start of each placement shift. This practice helps prevent student idleness and ensures that their attention is focused on specific technical objectives from the beginning.

- **Safety and PPE Audit:** The mentor checks the trainee's personal protective equipment (PPE), inspects the condition of tools, and identifies any temporary hazards present on the production line specific to the shift.
- **Task Alignment and Blueprint Connection:** The mentor clearly connects that day's production or maintenance task to a core curricular objective, such as aligning a diagnostic check on a conveyor system with the digital logic learning outcomes.
- **Success Criteria Definition:** The mentor establishes the technical limits, operating pressures, or software parameters that define successful task completion before any equipment is activated.



Implementing the Guided Interrogation Method

When a trainee makes a non-critical error or encounters a diagnostic roadblock on the production floor, company employees must refrain from taking over the machinery. Instead, they use the Guided Interrogation Method, which turns operational errors into valuable learning opportunities.

- **Socratic Troubleshooting:** Rather than directly pointing out a faulty sensor or misconfigured controller variable, the mentor asks targeted questions about the system's current behavior.
- **Schematic Alignment:** The mentor guides the trainee to refer to wiring diagrams, fluid power schematics, or HMI error logs to trace and isolate the fault systematically.
- **Root-Cause Verification:** The trainee must articulate the engineering rationale for their proposed solution before the mentor permits any corrective action or parameter reset.

Objective Tracking Using the Daily Performance Card

To ensure fairness and eliminate personal bias in assessing students, company mentors utilize a standardized Daily Micro-Performance Card. This checklist-based rubric replaces subjective evaluations with measurable task tracking.

- **60-Second Shift Assessment:** At the end of each shift, the mentor takes one minute to mark binary checkboxes that track safety compliance, technical tool handling, and the accuracy of shift logs.
- **Evidence-Based Documentation:** If a student receives a low or failing score in a specific competency, the mentor provides a concise, objective note detailing the exact machine parameter or safety rule that was violated.
- **Continuous Feedback Loop:** The collected cards create a data-driven performance log, which the school coordinator reviews during bi-weekly site visits to promptly identify and address technical skill gaps.

7.The Core Student Activity Log Template

The Logbook as a Legal and Educational Audit Trail

The student logbook serves as a legally binding audit trail that verifies the structural integrity of the dual education track. It is not merely a passive diary or an administrative formality. Instead, it is the primary verification tool for institutional quality assurance teams and regional accreditation bodies to ensure that a student's daily workplace activities align with the co-designed curriculum blueprint. If the logbook contains generic or repetitive entries, the placement will fail its audit, and the partnership will be flagged for task drift.

Guidelines for Technical Entry Formats

Date / Shift	Detailed Breakdown	Machinery utilized	Mentor Sign
Example: July 20	Assisted in diagnosing a loop communication fault on the automated distribution conveyor belt system.	Digital multimeter, PLC diagnostics terminal interface.	M. Petrovic
Example: July 23	Conducted physical isolation, pressure drop testing, and replacement of compromised pneumatic seals on an automated wire-bending apparatus.	SMC pneumatic cylinders, mechanical tension wrenches, digital pressure gauges.	M. Petrovic
Example: July 27	Diagnosed a repetitive loop communication fault causing operational lag between a programmable controller setup and automated sensor arrays.	Unitronics HMI interfaces, VisiLogic software terminal, digital multimeter.	M. Petrovic

TOOL A

WBL Pipeline Quality Audit Matrix

Purpose

Tool A is the main dashboard used to check the technology, health and safety standards, and teaching resources of potential host companies before confirming their placement.

Ref	Indicator	Score (1-4)	Evidence/Notes
1.1	The host enterprise officially acknowledges the student training track in tripartite agreements and regional dual-education mandates.		
1.2	Curriculum task blueprinting involves collaborating with technical instructors to define floor tasks that emphasize active green and digital competencies rather than repetitive general labor.		
2.1	Onsite mentors receive specialized training in pedagogical coaching frameworks, diagnostic monitoring, and logbook verification.		
2.2	Trainees regularly gain hands-on access to commercial-grade automated machinery, diagnostic instruments, and specialized controller interfaces.		
3.1	The factory floor upholds current risk assessment protocols, enforces proper PPE usage, and maintains comprehensive student liability insurance.		
3.2	Bi-weekly follow-up schedules are set between the vocational coordinator and the industry team leads.		

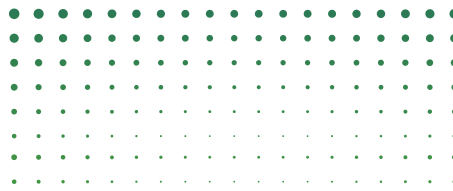
TOOL B

Industrial Partner Engagement

Purpose

Use this strategic mapping canvas during the pre-contractual partner screening phase. It helps simplify external labor market pressures and company capabilities into clear partnership models that create shared value. This approach directly helps prevent programmatic stagnation.

Strategic Alignment Vector	Local Industry Field Analysis & Shared Value Findings
Targeting Regional Infrastructure and Engineering Leads	
Identified Skill Gaps: Automated Networks and Electropneumatics	
Mutual Commercial Incentives and Resource Benefits	
Anticipated Floor Bottlenecks and Downtime Issues	



TOOL C

WBL Action Planner & Assessment Dashboard

Purpose

Tool C acts as the formal planner for corrective actions at the end of a cycle. Use it to convert placement gaps identified during bi-weekly audits — such as task drift, friction, or equipment downtime — into immediate administrative enhancements with measurable metrics.

Identified Field Competency Gap	Required Corrective Intervention	Assigned Owner	Target Timeline	Required Resources
Example: Placements suffering task drift to manual packaging loops.	Enforce signed Student Blueprint; issue a 24-hour shift suspension until floor tasks realign.	VET Supervisor	Immediate (24 hrs)	1 working day for executive field review.

8. Applied Professional Competency Rubric

Traditional academic testing models, which focus on abstract theoretical recall, written exams, and idealized classroom environments, are inadequate for evaluating a trainee's readiness for real industrial settings. For instance, a technical student may perform exceptionally well on written assessments regarding circuit laws or pneumatic symbols but may encounter performance issues or make safety violations when faced with actual equipment failures in a noisy production environment.

Core Competency Domain	Observed Technical Performance Metric	Rating (1 – 5)
Technical Diagnostic Execution	Assisted in diagnosing a loop communication fault on the automated distribution conveyor belt system.	/ 5
Precision Instrument Safety	Consistently sets up, runs, and cleans specialized workshop machinery without violating floor safety rules.	/ 5
Shift Communication & Logs	Documents technical problems clearly in shift logs and discusses issues effectively with team members.	/ 5
Adaptive Professional Focus	Shows strong punctuality, takes initiative on tasks, and reacts professionally to constructive feedback.	/ 5

9. Continuous Quality Control

A Work-Based Learning (WBL) ecosystem is inherently affected by the unpredictable and rapidly changing conditions typical of active industrial environments. Unlike the controlled and stable setting of a school laboratory, commercial manufacturing plants operate under dynamic corporate priorities, variable production schedules, unexpected machinery failures, and frequent personnel changes. As a result, even well-structured tripartite placement agreements and co-designed training plans may face operational variations in the field.

To protect the educational value of these placements against disruptions, technical institutions should not rely solely on end-of-term evaluations. The WBL Supervisor must implement a rigorous and proactive framework for Continuous Quality Control. This protocol requires bi-weekly on-site tracking visits and real-time logbook audits to identify, isolate, and address systemic gaps before they impact students' technical competencies.

Task Drift and the Relegation Loop

- **Operational Vulnerability:** During peak manufacturing cycles, host companies often face sudden labor shortages on basic production or assembly lines. Without prompt intervention, supervisors may inadvertently violate policy by reassigning technical trainees from their co-designed engineering tasks to repetitive manual labor, such as packaging, sorting, or basic cleanup.
- **Mandatory Corrective Protocol:** If any deviation from the co-designed training plan is detected during a bi-weekly logbook audit or student check-in, the institutional supervisor must immediately initiate a 24-hour placement stoppage. The school liaison is required to convene a formal realignment meeting with the plant's training manager to enforce the terms of the signed agreement. If the company declines to reinstate the student to high-value technical tasks, the partnership will be suspended, and the trainee will be permanently reassigned.

Interpersonal Friction and Communication Breakdowns

- **Operational Vulnerability:** Technical floor mentors often face significant pressure to meet strict corporate output targets. This pressure can lead to communication breakdowns or interpersonal friction with trainees. If a student reacts negatively to engineering feedback, or if a mentor struggles to provide adequate coaching, the placement environment can quickly become counterproductive.
- **Mandatory Corrective Protocol:** The school coordinator is required to intervene within 24 hours of a reported conflict by conducting a formal three-party mediation session. The supervisor will review behavioral indicators from the Daily Micro-Performance Cards to identify the root cause of the friction. If the conflict arises from a mismatch between the student's pace and the mentor's shift requirements, the trainee will be formally reassigned to a different maintenance cell or partner facility to preserve the integrity of the educational program.

Critical Line Downtime and Component Failure

- **Operational Vulnerability:** In heavy manufacturing environments, secondary automation lines, custom electropneumatic systems, and specialized diagnostic workstations are prone to significant mechanical failures. These failures can lead to prolonged plant closures or delays in component availability. When essential machinery is inoperative for extended periods, students lose access to the primary physical platforms outlined in their training plans.
- **Mandatory Corrective Protocol:** To prevent disruption of the student's training hours, the corporate mentor must promptly implement the Auxiliary Instructional Protocol. The student will be temporarily reassigned to advanced software simulation tasks, such as debugging controller code within VisiLogic environments, conducting detailed evaluations of engineering schematics, or observing complex preventative maintenance on operational backup lines. This approach ensures that the placement maintains its technical rigor despite unforeseen disruptions in the facility.



STEP 8 - Monitoring and evaluation

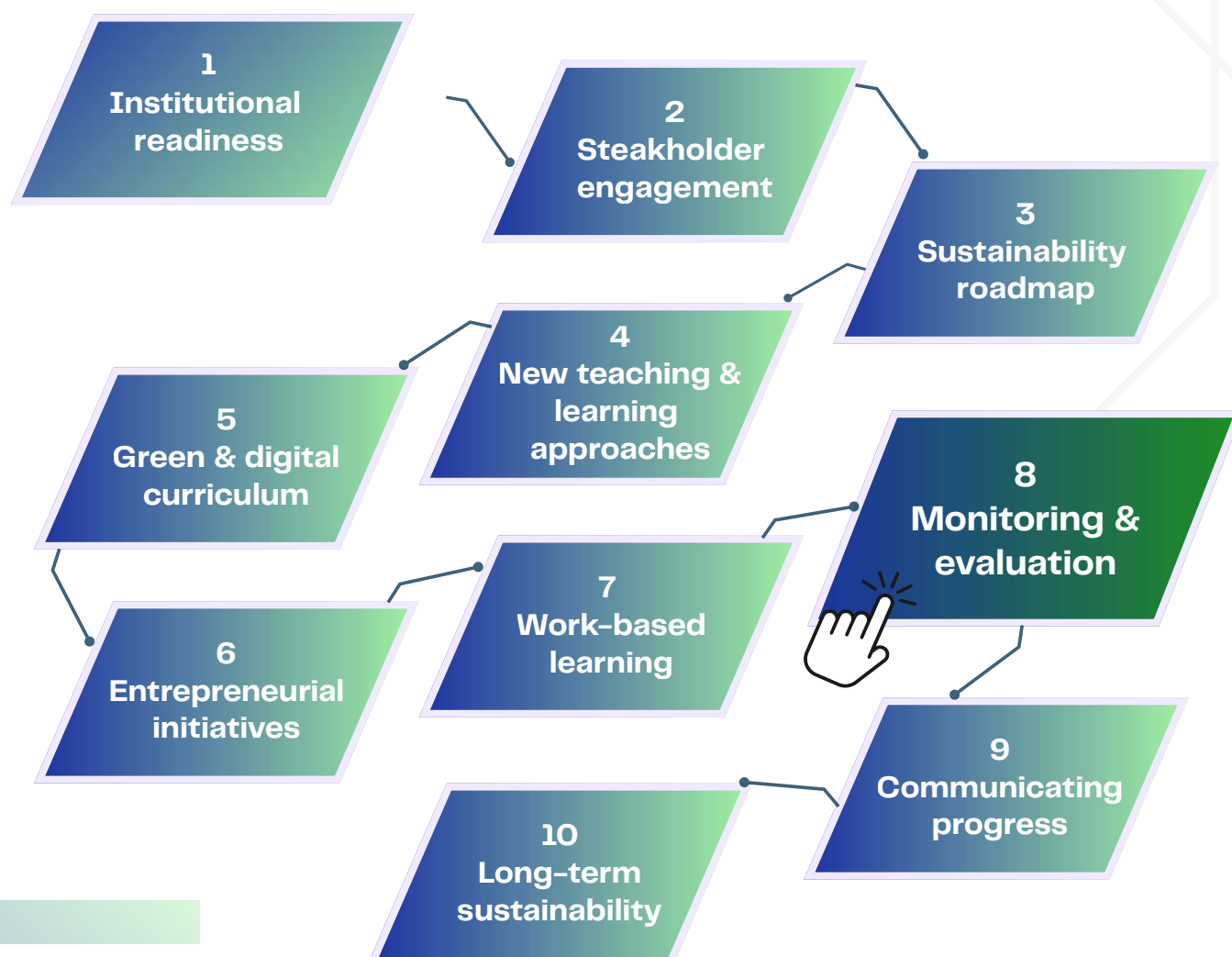
1. Purpose of this guide

Creating a monitoring and evaluation framework is Step 8 of the X-VET 10-Step Process Model. It answers a practical question: how do we know whether our actions are working?

The purpose of this guide is to help VET institutions to design a proportionate monitoring and evaluation system that is clear, usable and linked to decision-making. Monitoring and evaluation should not be treated as a final reporting activity. It should be part of a continuous improvement cycle, helping institutions understand what is changing, what is not changing, why progress is happening or blocked, and what should be adjusted.

This guide provides three ready-to-use tools that help to collect quantitative and qualitative evidence, interpret progress, involve stakeholders in review, and convert findings into practical improvements.

2. Step 8 within the 10-Step Process Model



Step 8 has a bridging function in the 10-Step Process Model. It connects implementation with accountability, learning and long-term sustainability. It transforms the elements designed in the previous steps into a structured evidence system. The output of Step 8 feeds directly into Step 9, because communication should be based on reliable evidence rather than general statements. It also feeds into Step 10, because long-term sustainability depends on the institution's ability to keep reviewing, adapting and embedding successful practices over time.

3. The importance of monitoring and evaluation

Sustainability initiatives in VET need clear monitoring and evaluation processes to avoid they remain fragmented or merely symbolic. A structured monitoring and evaluation framework helps institutions to understand whether their actions are generating real educational, organisational, environmental, social and labour-market value. It also supports quality assurance, evidence-based decision-making, transparent communication with stakeholders, and the long-term integration of sustainability into curricula, institutional planning and learning outcomes.

4. The four monitoring areas

The monitoring and evaluation framework should cover the whole institution, not only isolated learning activities. For this reason, the framework is structured around four main areas.



Sustainability in institutional planning

Aim: to embed principles of sustainability in the plans and culture of the institution so that sustainable behaviours become part of the norms of everyone in the institution

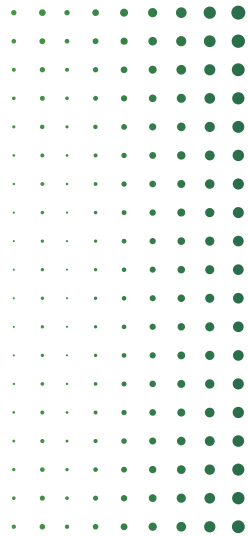
Sustainability in curriculum and pedagogy

Aim: to help individual learners to recognise their personal and professional responsibilities toward sustainability and to develop the related knowledge, skills and attitudes

Sustainability in professional training and development.

Aim: to equip teachers and trainers with the competences they need to play a full role in institutional sustainability and support learners to develop related competences

Sustainability in the community, workplace and lifelong learning Aim: to cultivate or refine cooperation arrangements and partnerships on sustainability with local companies and the wider community for mutual benefit



Tool A

Sustainability Monitoring and Evaluation Matrix

Purpose

To convert sustainability objectives into a structured monitoring plan and ensure that every indicator has a baseline, target, data source, responsible person and review date

Instructions

1. Select no more than two or three outcomes for each area.
2. Include both quantitative and qualitative indicators.
3. Record the baseline before setting the target.
4. Avoid indicators for which no realistic source of evidence exists.
5. Assign one accountable owner to each indicator.

Main output

A completed institutional M&E plan approved by management and integrated into the sustainability roadmap

Below an example

Expected outcome	Indicator	Baseline	Target to be reached	Means of verification	Frequency	Responsible
Area 2 Sustainability in curriculum and pedagogy						
Sustainability competences are integrated into programmes	% of programmes with assessed sustainability learning outcomes	10%	70%	curriculum audit	6 months	curriculum coordinator

Expected outcome	Indicator	Baseline	Target to be reached	Means of verification	Frequency	Responsible
Area 1 Sustainability in institutional planning						

Expected outcome	Indicator	Baseline	Target to be reached	Means of verification	Frequency	Responsible
Area 2 Sustainability in curriculum and pedagogy						

Expected outcome	Indicator	Baseline	Target to be reached	Means of verification	Frequency	Responsible
Area 3 Sustainability in professional training and development						

Expected outcome	Indicator	Baseline	Target to be reached	Means of verification	Frequency	Responsible
Area 4 Sustainability in the community, workplace and lifelong learning						

Tool B

Sustainability progression assessment

Purpose

To assess how far sustainability has become embedded across the four areas and to make uneven progress visible.

Explanation table of the progression assessment (please note: the table derives directly from the UNESCO-UNEVOC model, which uses it to visualise progress across the different areas of institutional greening).

Score	Progress indicator	Description	Level of adaptation
1	beginning	A beginning stage of change	Early adaptation
2	some progress	Some progress with achieving change	Some evidence of adaptation
3	Satisfactory progress	Satisfactory progress with achieving change	evidence of adaptation is producing observable results
4	Stable and embedded change	A stable and embedded change	evidence and results demonstrate the impact that the action makes (create stable and demonstrable changes)

For each of the four areas, select at least two expected outcomes and ask participants to choose the progress indicator that has been achieved and to explain their choice, providing data and/or evidence to support it

Area 1: Sustainability in institutional planning

Expected outcome	beginning	some progress	Satisfactory progress	Stable and embedded change	Explanation by providing data and/or evidence

Area 2: Sustainability in curriculum and pedagogy

Expected outcome	beginning	some progress	Satisfactory progress	Stable and embedded change	Explanation by providing data and/or evidence

Area 3: Sustainability in professional training and development

Expected outcome	beginning	some progress	Satisfactory progress	Stable and embedded change	Explanation by providing data and/or evidence

Area 4: Sustainability in the community, workplace and lifelong learning

Expected outcome	beginning	some progress	Satisfactory progress	Stable and embedded change	Explanation by providing data and/or evidence

Reflection questions

- Which area needs more improvement?
- Which high scores are supported by documented evidence?
- Which area require additional data?

Tool C

Sustainability perception of involved people

Purpose

To periodically get the perceptions of teachers, students, staff, management, trainers and business partners. It is particularly useful for measuring aspects that are difficult to observe through administrative data, such as:

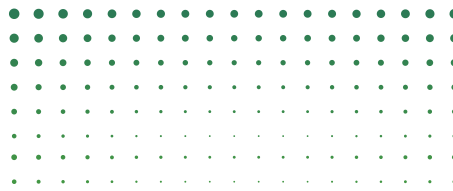
- awareness;
- participation;
- trust;
- organisational culture;
- the relevance of training;
- perceptions of leadership.

Questionnaire

Respondents rate each statement on a scale of 1 to 5:

- 1 = strongly disagree
- 5 = strongly agree

Question	Rating from 1 to 5
I am familiar with the institution's sustainability objectives	
Sustainability is integrated into teaching and learning activities	
Students can participate in decisions regarding sustainability	
Staff receive support to introduce sustainable practices	
The institution's facilities encourage sustainable behaviour	
The management regularly reports on progress made about sustainability	



Tool C

Sustainability perception of involved people

Open question

- What is the main obstacle to the institution's sustainability?

- Which action should be given priority?

- Which initiative should be expanded or modified?

The results can be compared:

- between different stakeholder groups;
- between departments or programmes;
- between management's perceptions and students' perceptions;
- between the institution and partner organisations



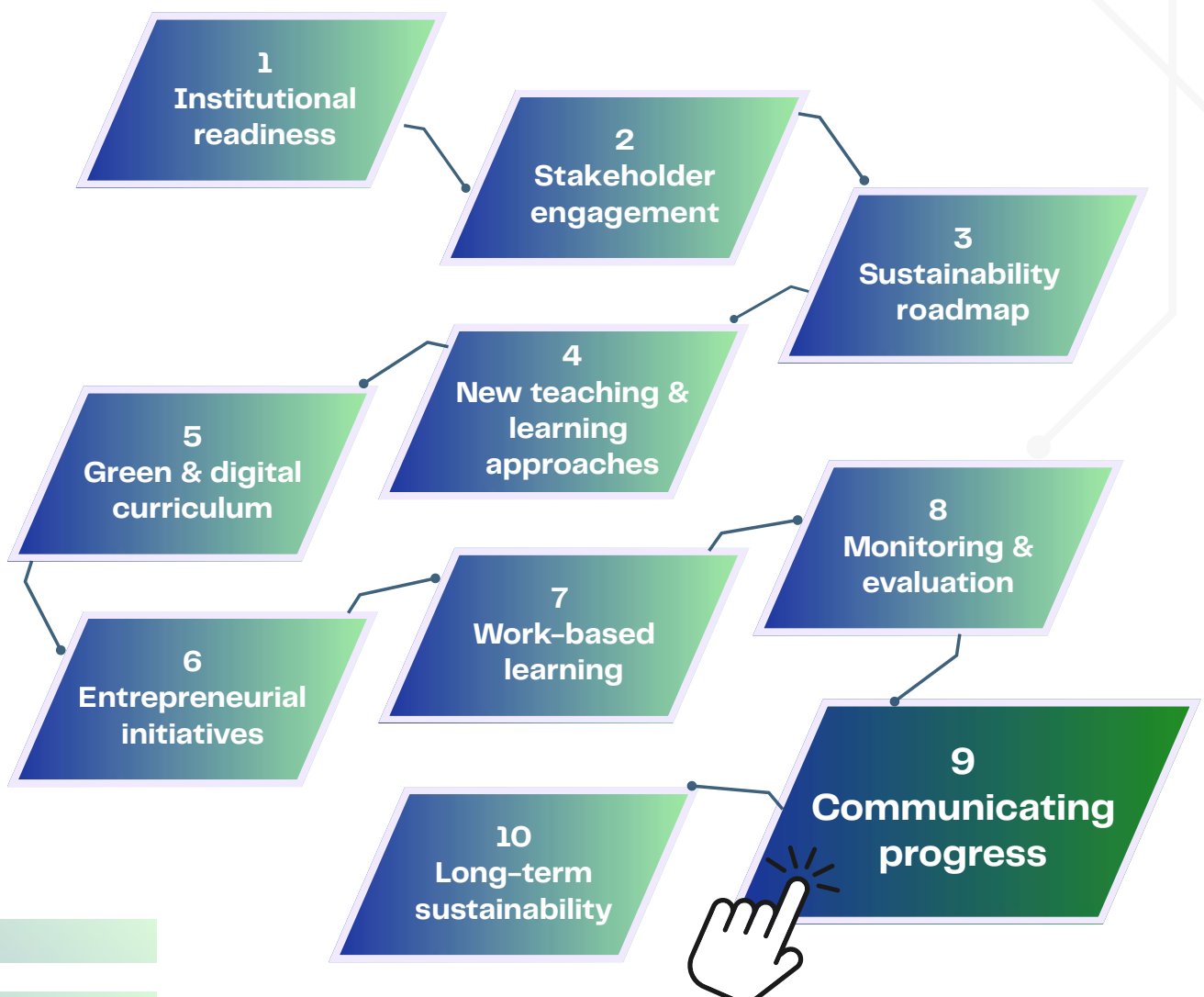
STEP 9 - Communicating progress

1. Purpose of this guide

Communicating progress is the ninth step of the X-VET 10-Step Process Model. After collecting baseline data (Step 1), engaging stakeholders (Step 2), setting roadmaps (Step 3), implementing green & digital teaching, curricula, entrepreneurial projects, work-based learning (Steps 4–7), and monitoring performance (Step 8), institutions must effectively share their achievements and lessons learned.

Step 9 converts raw data from Step 8 into transparent, engaging narratives and official reports. It protects the institution against greenwashing by demanding verifiable evidence for every claim

2. Step 9 within the 10-Step Process Model



How Step 9 draws on the competence framework?

The Step 9 is primarily driven by Competence C6 (Communicating, Advocacy & Stakeholder Engagement). It translates technical data and institutional progress into transparent, engaging narratives and official reports tailored to both internal and external audiences.

3. Why communication matters

Communication is far more than a routine public relations exercise – it is an essential operational pillar that converts raw institutional data into active cultural transformation and policy compliance. Grounded in European strategic directives – such as the EU Green Deal, the Digital Education Action Plan, and the European Skills Agenda – as well as international operational standards like ESG, ISO 14001, and EMAS, educational providers face increasing institutional pressure to demonstrate explicit, evidence-backed accountability across all facets of their operations.

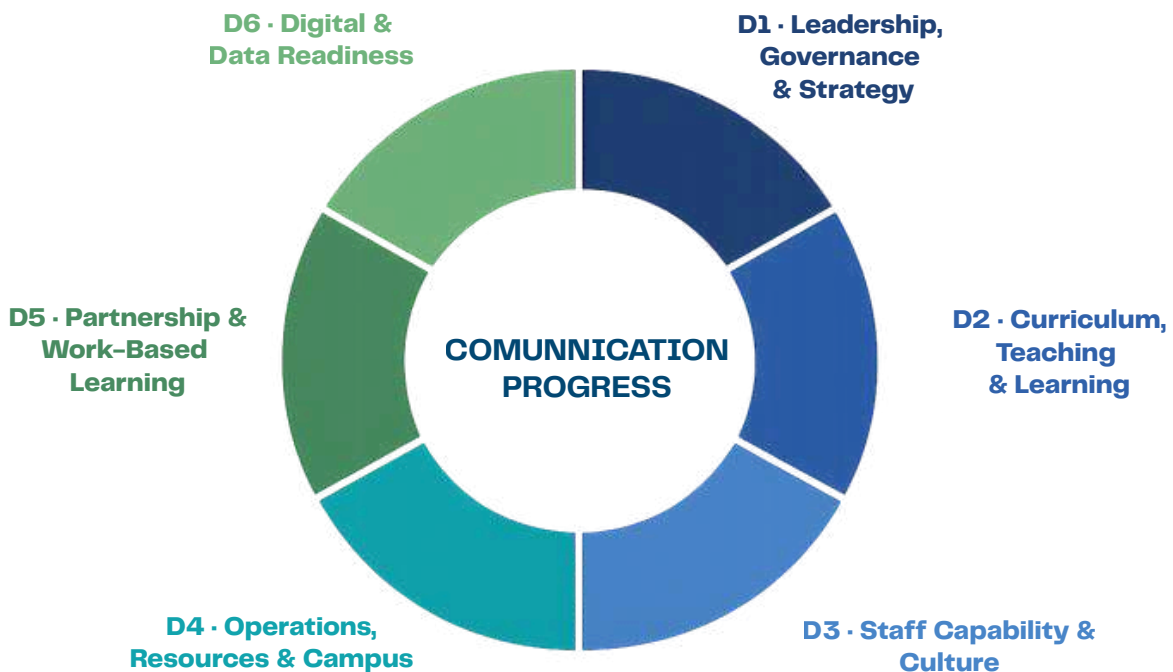
Within the X-VET 10-Step Process Model, Step 9 bridges the gap between performance monitoring (Step 8) and long-term institutional embedding (Step 10) by taking evaluated indicators and translating them into transparent, engaging narratives tailored to diverse internal and external stakeholders.

Effective communication serves 3 vital functions within a Vocational Education and Training (VET) institution:

- **Builds Trust and Transparency:** By mandating that all published claims be backed by verifiable data collected during monitoring and evaluation, robust communication replaces unsubstantiated assertions with evidence, directly safeguarding the institution against greenwashing.
- **Engages Learners and Staff:** Transparent reporting serves as an internal catalyst for engagement, celebrating quick wins, best practices, and tangible achievements—such as student hackathon prototypes, new green and digital learning modules, and micro-credential acquisitions—thereby reinforcing a shared culture of sustainability across departments.
- **Enhances Institutional Reputation:** By systematically broadcasting progress across all six dimensions of the whole-institution approach (Governance, Curriculum, Staff Capability, Campus Operations, Partnerships, and Digital Readiness), the institution establishes itself as a regional and national leader in the twin Green & Digital transition. This enhanced standing attracts prospective learners, builds stronger ties with employer partners, and secures long-term institutional alignment with European policy frameworks.

4. The six dimensions of sustainability communication

Communication must cover all six dimensions of the X-VET Whole-Institution Approach:



D1 - Leadership, Governance & Strategy.

Communicating institutional ESG commitments, updated sustainability roadmaps, dedicated budget allocations, management decisions, and policy shifts.

D2 - Curriculum, Teaching & Learning.

Highlighting green and digital learning outcomes across vocational courses, pass rates in newly embedded sustainability modules, and experiential learning methods.

D3 - Staff Capability & Culture.

Publicizing continuous professional development (CPD) completion rates, internal sustainability awards, individual teacher achievements, and institutional cultural milestones.

D4 - Operations, Resources & Campus.

Reporting data on carbon footprint reduction, energy and water savings, sustainable procurement policies, waste management, and living-lab campus initiatives.

D5 - Partnerships & Work-Based Learning.

Sharing outcomes and impacts from employer collaborations, local sustainability hackathons, community projects, and green work placements.

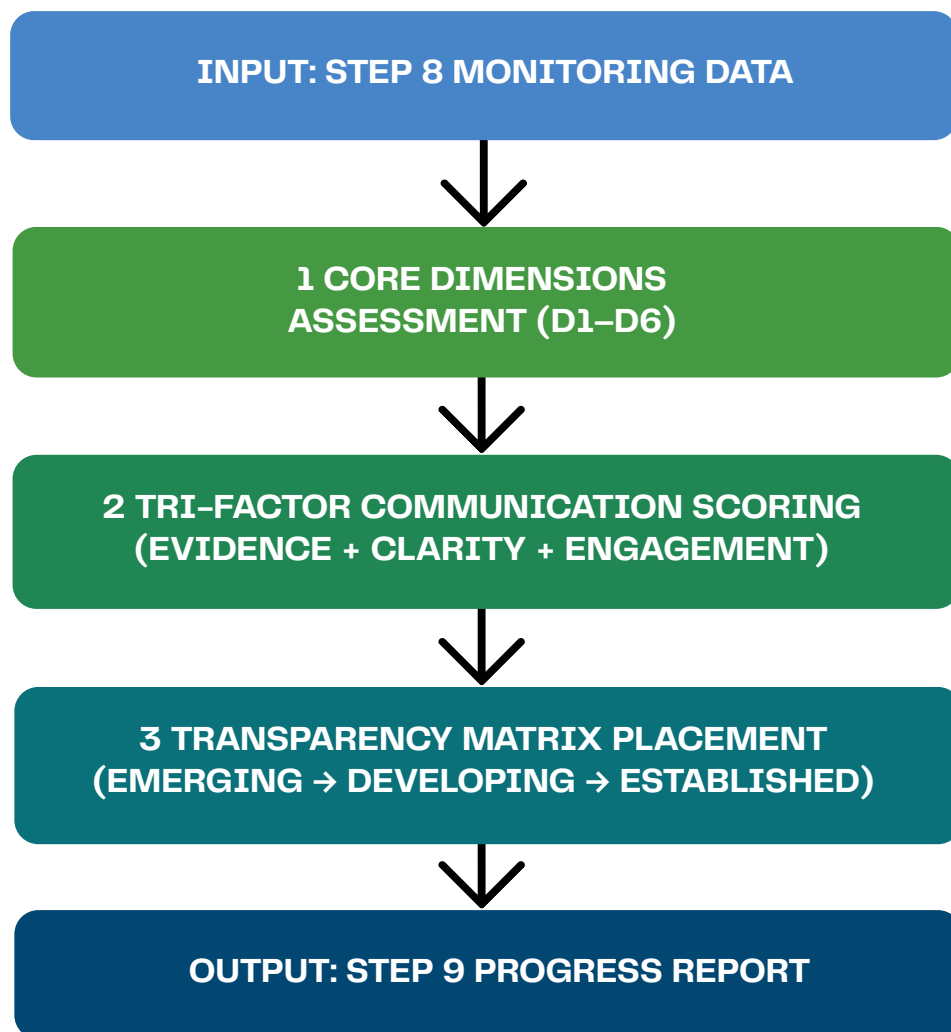
D6 - Digital & Data Readiness.

Disseminating progress through digital portals, publishing MOOC completion and micro-credential data, and highlighting actions taken to reduce the environmental footprint of institutional ICT systems (twin-transition dimension).

Tool A

VET Sustainability Communication & Impact Matrix (SCIM)

This practical and useful tool acts as an operational bridge between raw monitoring data (Step 8) and transparent public reporting (Step 9), specifically designed to evaluate the clarity, evidence strength, and audience reach of an institution's sustainability communications.



Structure of the SCIM Tool

The SCIM Tool evaluates communication actions across the Six Dimensions of the Whole-Institution Approach (D1-D6) using a weighted Tri-Factor Scoring Formula:

$$\text{Communication Score (CS)} = (\text{Evidence Level} \times 0.40) + (\text{Clarity \& Accessibility} \times 0.30) + (\text{Audience Engagement} \times 0.30)$$

The Logical Scoring System (1–4 Scale)

Each communication asset (e.g., Annual Progress Report, Student Hackathon Showcase, Employer Briefing, Social Media Campaign) is evaluated on three criteria:

Factor A: Evidence & Anti-Greenwashing Level (Weight: 40%)

- 1 – Unverified: Vague claims without supporting baseline metrics or data.
- 2 – Self-Reported: Descriptive accounts backed by internal feedback or qualitative notes.
- 3 – Data-Backed: Supported by quantitative KPIs from internal monitoring systems (e.g., Step 8 evaluation data, LMS completion rates).
- 4 – Externally Validated: Backed by third-party verification, micro-credentials issued, or ISO 14001 / EMAS alignment.

Factor B: Clarity & Digital Accessibility (Weight: 30%)

- 1 – Technical / Insular: Dense administrative text or inaccessible formats.
- 2 – Basic Visuals: Summarized text with standard graphics or tables.
- 3 – Multi-Format: Uses clear infographics, digital dashboards, or video summaries accessible on desktop/mobile.
- 4 – Fully Inclusive: Follows Universal Design (captions, screen-reader compatibility, multilingual versions, low-bandwidth options).

Factor C: Audience Engagement & Reach (Weight: 30%)

- 1 – Passive / Internal Only: Archived on an internal drive or board meeting agenda.
- 2 – One-Way Push: Single broadcast (e.g., standard email newsletter or website post).
- 3 – Interactive: Includes feedback loops, user surveys, or live webinar showcase sessions.
- 4 – Multiplier Effect: Co-created with student ambassadors, shared across European platforms (e.g., EPALE), or driving active external employer partnerships.

Practical Scoring Matrix Worksheet

Dimension evaluated	Communication asset	Evidence score (1-4) x 0.4	Clarity score (1-4) x 0.3	Engagement score (1-4) x 0.3	Total score (1.0-4.0)	Communication maturity level
D1 · Leadership, Governance & Strategy	Annual ESG Strategy Report	3	2	2	2.4	Developing
D2 · Curriculum, Teaching & Learning	MOOC & Green Module Pass Rates	4	3	3	3.4	Leading
D3 · Staff Capability & Culture	Staff CPD & Teacher Training Badge Campaign	3	3	2	2.7	Established
D4 · Operations, Resources & Campus	Campus Energy & Carbon Footprint Infographic	4	4	2	3.4	Leading
D5 · Partnerships & Work-Based Learning	Local Sustainability Hackathon Showcase Webinar	3	4	4	3.6	Leading
D6 · Digital & Data Readiness	Digital Micro-Credentials Dashboard	4	3	3	3.4	Leading
OVERALL	<i>(Calculated Mean across D1–D6)</i>				3.15	ESTABLISHED

Tool B

Sustainability Communication Plan (SCP)

The Sustainability Communication Plan (SCP) provides a structured, repeatable template for VET institutions to translate complex environmental data into clear, audience-tailored narratives. It bridges Step 8 (Monitoring & Evaluation) and Step 10 (Long-Term Sustainability) by establishing clear responsibilities, channels, and verified content schedules that eliminate greenwashing and ensure maximum outreach across the local and European VET ecosystem.

The 3-Stage SCP Framework

Stage 1: Audience & Channel Alignment

Identifies the primary stakeholder groups across the 6 Whole-Institution dimensions and matches them with their preferred communication channels and frequency.

Stage 2: Message & Evidence Mapping

Links every public statement directly to verified metrics from Step 8, ISO 14001/EMAS operational data, or formal micro-credentials earned.

Stage 3: Campaign Execution & Feedback Loops

Sets delivery dates, assigns internal owners, defines the required SCIM (Sustainability Communication & Impact Matrix) target score, and establishes mechanisms to capture public feedback.

Operational Guidelines for Using the SCP

1. Populate from Step 8: Never draft core messages without first importing verified quantitative and qualitative metrics from the Step 8 evaluation dashboard.
2. Apply the SCIM Quality Filter: Before publishing any campaign listed in the SCP, run the draft assets through the SCIM Tool to ensure the content achieves a minimum Evidence Score of 3.0 (preventing greenwashing).
3. Establish Feedback Loops: Ensure every digital channel used (e.g., LMS, social media, web forms) contains a short mechanism (QR code or survey link) to capture reader feedback and refine future campaigns.
4. Feed Directly into Step 10: Consolidate all completed campaign records into the Institutional Sustainability Progress Report (Tool C) at the end of the annual cycle to support long-term budget allocations and strategic policy integration under Step 10.

Practical Sustainability Communication Plan Worksheet

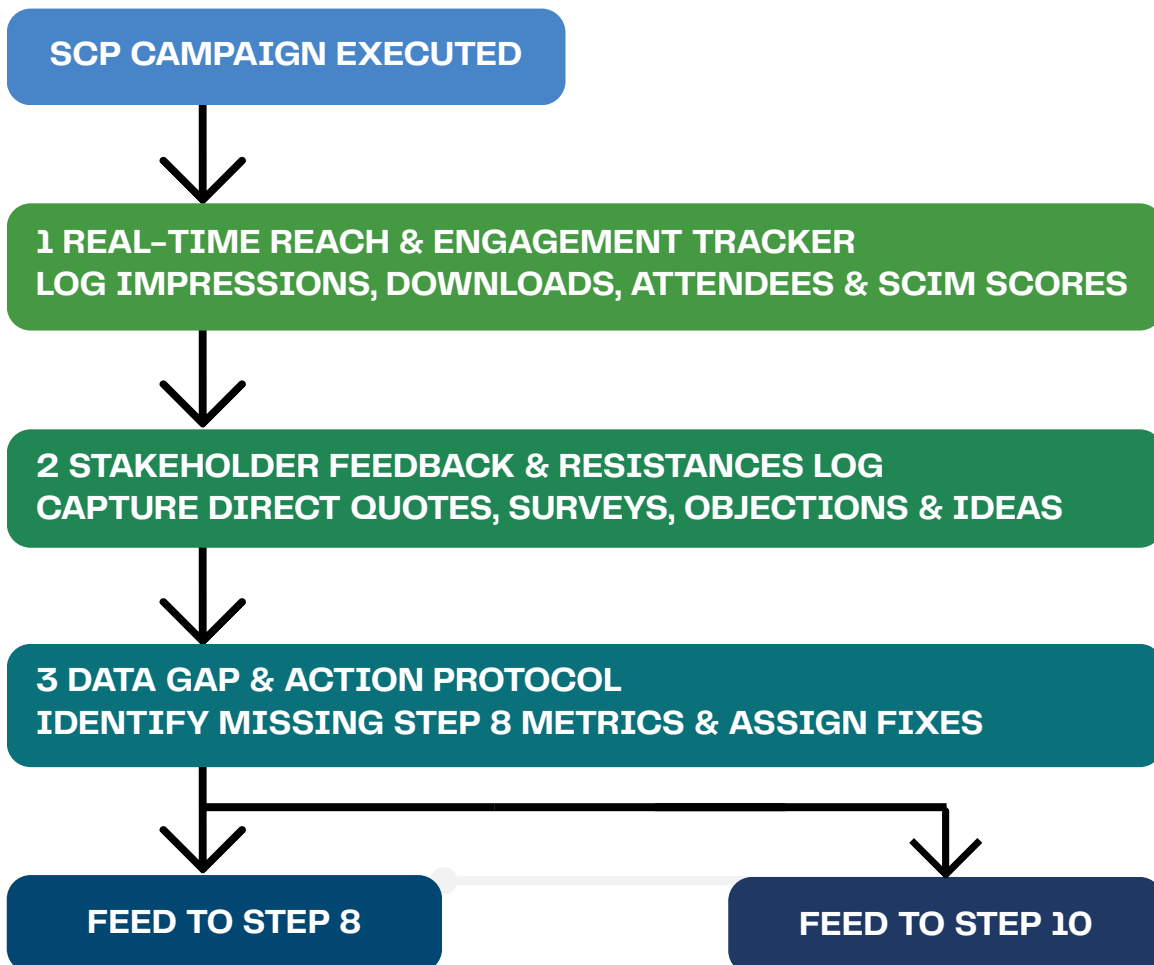
Target audience	Whole institution dimension	Core message & narrative focus	Supporting evidence	Primary channel(s)	Delivery timeline	Target SCIM score
VET Learners & Apprentices	D2 (Curriculum) & D6 (Digital)	Showcase pass rates in green MOOC modules and micro-credentials earned	LMS completion stats & digital badges issued	LMS dashboard, Instagram/LinkedIn, campus displays, student newsletter	End of Term (Semi-Annual)	3.0+ (Data-Backed)
VET Educators & Staff	D3 (Staff Capability)	Celebrate teacher CPD milestones and peer-led hackathon achievements	Survey results, CPD training logs, Hackathon prototypes	Internal newsletter, staff development meetings, staff intranet	Bi-Monthly	2.8+ (Data-Backed)
Employers & Industry Partners	D5 (Partnerships & WBL)	Demonstrate workforce green skills alignment and circular economy hackathon solutions	Employer feedback scores, WBL placement data	LinkedIn posts, Industry breakfast briefings, direct briefs	Quarterly	3.5+ (Verified / Multiplier)
Institutional Leadership & Board	D1 (Governance) & D4 (Operations)	Report on overall ESG compliance, energy/waste reductions, and budget efficiency	Campus carbon footprint data, energy billing reductions	Formal progress report, executive board briefing	Annual Reporting Cycle	3.5+ (Verified)
European VET Community & Policy Bodies	D1–D6 (Whole-Institution)	Position the institution as a regional/Europe an benchmark in the twin transition	SCIM overall score, verified baseline trend lines	EPALE platform articles, project website, EU webinars	Annual (Pre-Step 10 handover)	3.8+ (European Benchmark)

Tool C

Communication Tracker & Feedback Log (CTFL)

While the SCIM evaluates communication quality and the SCP plans outreach schedules, the CTFL acts as the operational register. It monitors real-time channel engagement, logs stakeholder feedback, and captures data gaps, directly feeding into Step 8 (for data refinements) and Step 10 (for long-term institutional embedding).

Institution name	[Insert VET Institution Name]
Tracking period	[e.g., Academic Year 2026/2027]
Log coordinator	[Name / Role]
Parent plan	Linked to Sustainability Communication Plan (SCP)

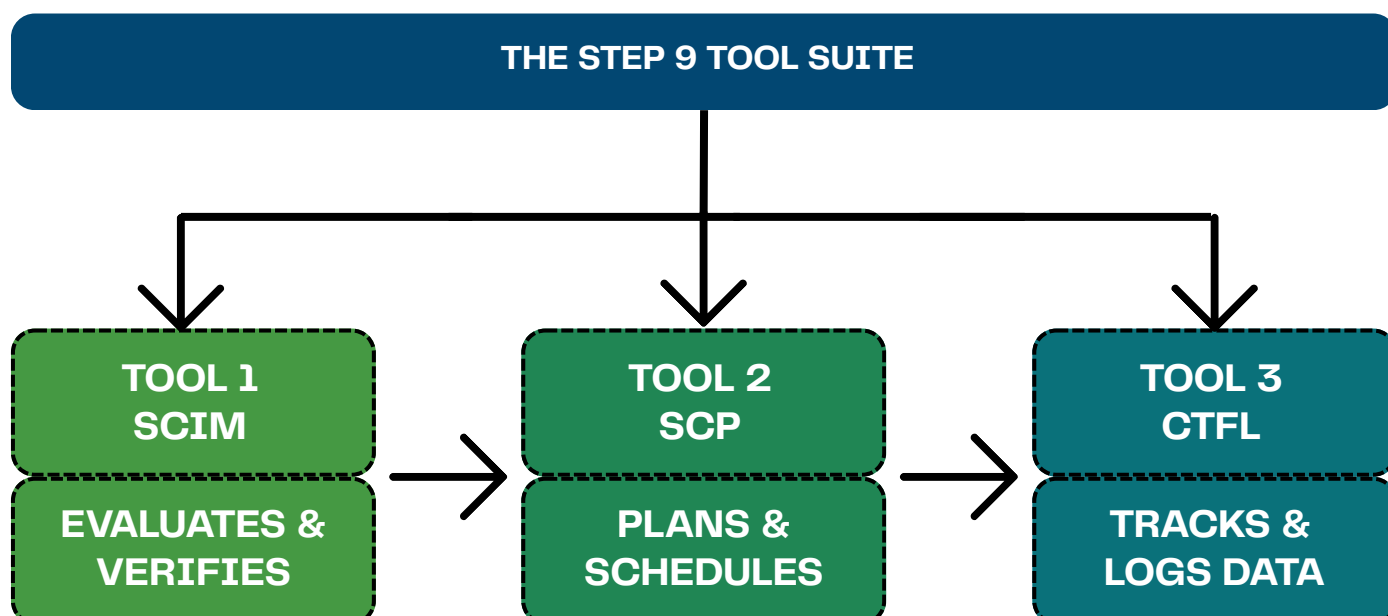


5. Interpreting your results

Based on the overall score, the institution's communication maturity is categorized into clear actionable bands:

Band	Overall avg	What it typically means	Recommended focus
Emerging	1.0 – 1.7	High risk of greenwashing, unverified.	Stop unverified claims; link communications directly to monitoring metrics.
Developing	1.8 – 2.5	Fragmented reporting, ad-hoc posts, poor data integration.	Standardize formats and introduce visual infographics for non-technical readers.
Established	2.6 – 3.3	Reliable, data-backed communications, structured reports, verified KPI data.	Expand audience outreach to external industry partners and regional authorities.
Leading	3.4 – 4.0	Transparent, accessible, data-driven multi-channel communication benchmark.	Mentor peer VET institutions and publish best practices on European platforms.

Summary of the Step 9 Tool Suite



Tool 1: VET Sustainability Communication & Impact Matrix (SCIM)

- Function: A quality assurance and anti-greenwashing evaluation matrix.
- Core Role: Evaluates draft communication assets using a weighted formula based on Evidence Level (40%), Clarity/Accessibility (30%), and Audience Engagement (30%). It assigns assets a score from 1.0 to 4.0 across four maturity bands (Emerging, Developing, Established, Leading).

Tool 2: Sustainability Communication Plan (SCP)

- Function: A strategic planning and messaging template.
- Core Role: Maps out outreach campaigns across all six whole-institution dimensions (Governance, Curriculum, Staff Capability, Operations, Partnerships, and Digital Readiness). It aligns specific target audiences (learners, staff, employers, leadership, EU networks) with verified Step 8 data sources, preferred channels, owners, and delivery dates.

Tool 3: Communication Tracker & Feedback Log (CTFL)

- Function: An operational register and feedback processing tool.
- Core Role: Records real-time campaign performance (reach, views, downloads), logs qualitative stakeholder feedback/resistances, and identifies data gaps. It acts as a continuous feedback loop, sending missing indicator fixes to Step 8 (M&E Framework) and policy justification notes to Step 10 (Long-Term Embedding).

Key Advantages for the VET Sector

- **Eliminates Greenwashing Through Verified Data:** By requiring every communication asset to be scored against Step 8 evaluation data, the suite ensures all public claims, student badges, and employer briefs are backed by audit-ready, quantitative metrics.
- **Bridging Technical Data and Stakeholder Action:** It translates complex environmental, operational, and educational indicators into accessible visual formats (e.g., student infographics, employer briefs, digital micro-credential badges) tailored specifically to diverse VET audiences.
- **Systematic Connection Between Evaluation and Policy:** The tools form a dynamic loop that feeds identified data gaps directly back into Step 8 (M&E Framework) while delivering verified impact reports to Step 10, securing long-term budget allocations and strategic policy embedding across the institution.
- **Standardized European Alignment:** The suite integrates recognized EU frameworks—including GreenComp, DigComp, EntreComp, EQF, and European Micro-Credentials—allowing VET providers to showcase transparent, portable progress that enhances institutional standing across national and EU networks.

6. From progress reporting to institutional embedding: feeding Step 10

Close Step 9 with a deliberate handover, not a filing action. Three critical transfers establish a direct connection to Step 10 (Long-Term Sustainability):

- **Evidence & Policy Integration:** The Institutional Sustainability Progress Report (Tool C), along with verified KPI milestones, published case studies, and micro-credential pass rates, is handed over directly to the Step 10 institutionalization team. This body of evidence provides the strategic foundation, legitimacy, and policy leverage needed to permanently embed sustainability into long-term VET governance, strategic plans, and formal institutional policies.
- **Resource & Budget Commitment:** The verified communication outcomes from Step 9 demonstrate measurable institutional impact to internal leadership and external funding bodies, securing the long-term budget allocations and strategic resources required under Step 10 to sustain green and digital initiatives indefinitely.
- **Setting the Annual Strategic Trend Line:** Agree on a review date (typically 12 months) at handover. Repeating the Step 9 progress report annually converts a one-off achievement into a continuous, multi-year trend line, providing Step 10 with a permanent, evolving benchmark for long-term institutional sustainability.

9. Quality checklist

Before declaring Step 9 complete, confirm:

- ☒ Senior leadership and the cross-functional working group have formally reviewed and approved the final progress report
- ☒ All public claims are backed by Step 8 evaluation data and meet the SCIM tool's anti-greenwashing standards.
- ☒ The report reflects progress across all six X-VET institutional dimensions, including both green and digital outcomes.
- ☒ The institution has achieved a SCIM score of at least Established (2.6–3.3) to confirm reporting quality.
- ☒ Communication assets are tailored to target audiences and comply with universal digital accessibility standards.



STEP 10 - Long-term sustainability

1. Purpose of this guide

From Projects to Institutional Culture

Many sustainability initiatives begin with enthusiasm, innovative ideas and dedicated project teams. While these initiatives often generate valuable results, their long-term impact depends on whether they become part of the institution itself. Sustainability is not achieved through isolated activities or short-term projects, but through consistent leadership, shared responsibility and continuous organisational learning.

The previous steps of the X-VET Workbook have guided institutions through assessing their current situation, engaging stakeholders, developing strategic priorities, implementing innovative teaching and learning approaches, strengthening cooperation with partners and establishing monitoring processes. Together, these steps create the foundation for institutional transformation.

Step 10 focuses on ensuring that this transformation continues beyond the lifetime of a project. The goal is to embed integrated sustainability into the institution's governance, strategic planning, quality management and everyday decision-making. Sustainability becomes a guiding principle that influences leadership, curriculum development, staff development, partnerships and resource allocation.

Long-term sustainability also requires institutions to remain adaptable. Social, environmental and economic conditions continue to evolve, and VET institutions must regularly review their priorities, evaluate their progress and respond to emerging challenges and opportunities. Continuous improvement therefore becomes an essential component of sustainable institutional development.

Rather than representing the end of the X-VET process, this step marks the beginning of a continuous improvement cycle. Institutions are encouraged to reflect on their achievements, identify new priorities and initiate the next cycle of development. In this way, sustainability becomes an ongoing organisational capability rather than a final destination.

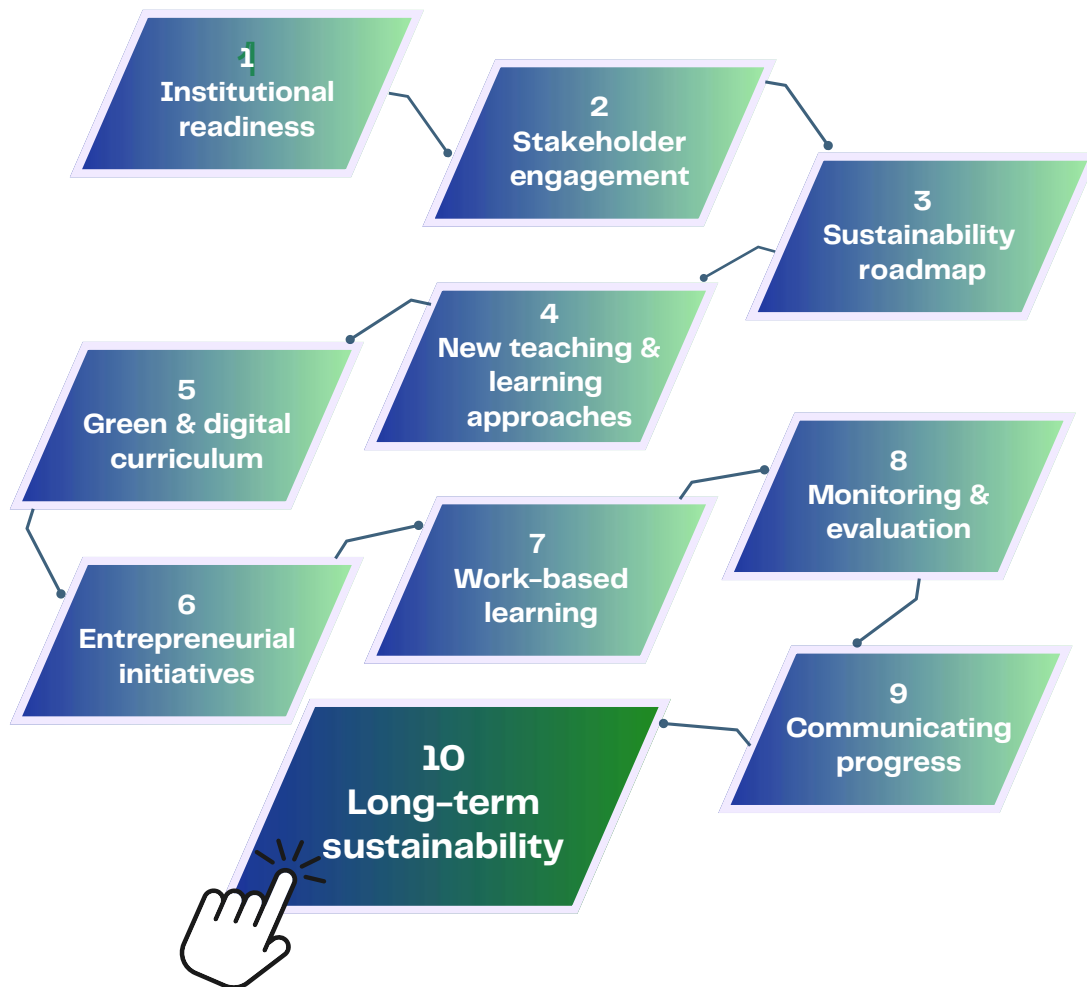
By embedding sustainability into institutional structures, responsibilities and organisational culture, VET institutions strengthen their resilience, enhance their capacity for innovation and create lasting value for learners, staff, regional partners and society as a whole.

Project Implementation Framework





2. Step 10 within the 10-Step Process Model



3. Long-term Sustainability

Sustainability becomes truly effective when it moves beyond individual projects and is integrated into the everyday functioning of an institution. While projects often initiate innovation and generate valuable experiences, long-term impact depends on whether these achievements become embedded in institutional structures, decision-making processes and organisational culture.

For VET institutions, long-term sustainability is not an additional activity but a strategic approach to institutional development. It requires sustainability to be considered in leadership decisions, governance structures, teaching and learning, quality assurance, staff development and external cooperation. When sustainability is integrated across these areas, it becomes part of how the institution plans, operates and evolves rather than remaining a series of isolated initiatives.

Embedding sustainability is a continuous process. Institutions regularly assess their progress, identify emerging challenges and adapt their strategies to changing environmental, social, economic and technological conditions. This process strengthens institutional resilience and enables organisations to respond proactively to future developments while maintaining their educational quality and relevance.

The Building Blocks of Long-term Sustainability

Long-term sustainability is built upon several interconnected dimensions that reinforce one another and create a coherent institutional approach.

Leadership and Vision

Institutional leaders establish a shared vision for sustainability, communicate clear priorities and ensure that sustainability remains a long-term strategic objective. Leadership also creates the conditions for innovation by encouraging participation, collaboration and continuous learning throughout the organisation.

Governance and Organisational Structures

Sustainability should be reflected in institutional policies, responsibilities and decision-making processes. Clearly defined governance structures ensure that sustainability is embedded in everyday operations and remains independent of individual projects or personnel changes.

Teaching and Learning

Teaching practices, curricula and learning environments should progressively integrate sustainability principles and interdisciplinary thinking. Educators play a central role in supporting learners to develop the competences required to navigate environmental, digital, social and economic transformations.

Partnerships and Stakeholder Engagement

Long-term institutional development benefits from strong cooperation with employers, local authorities, civil society organisations, higher education institutions and learners. Active partnerships contribute new perspectives, strengthen innovation and increase the relevance of educational activities.

Quality Assurance and Continuous Improvement

Sustainable institutions regularly monitor their progress, reflect on achievements and identify opportunities for further development. Continuous evaluation supports evidence-based decision-making and enables institutions to adapt to new challenges while building on existing strengths.

Building Sustainable Institutions



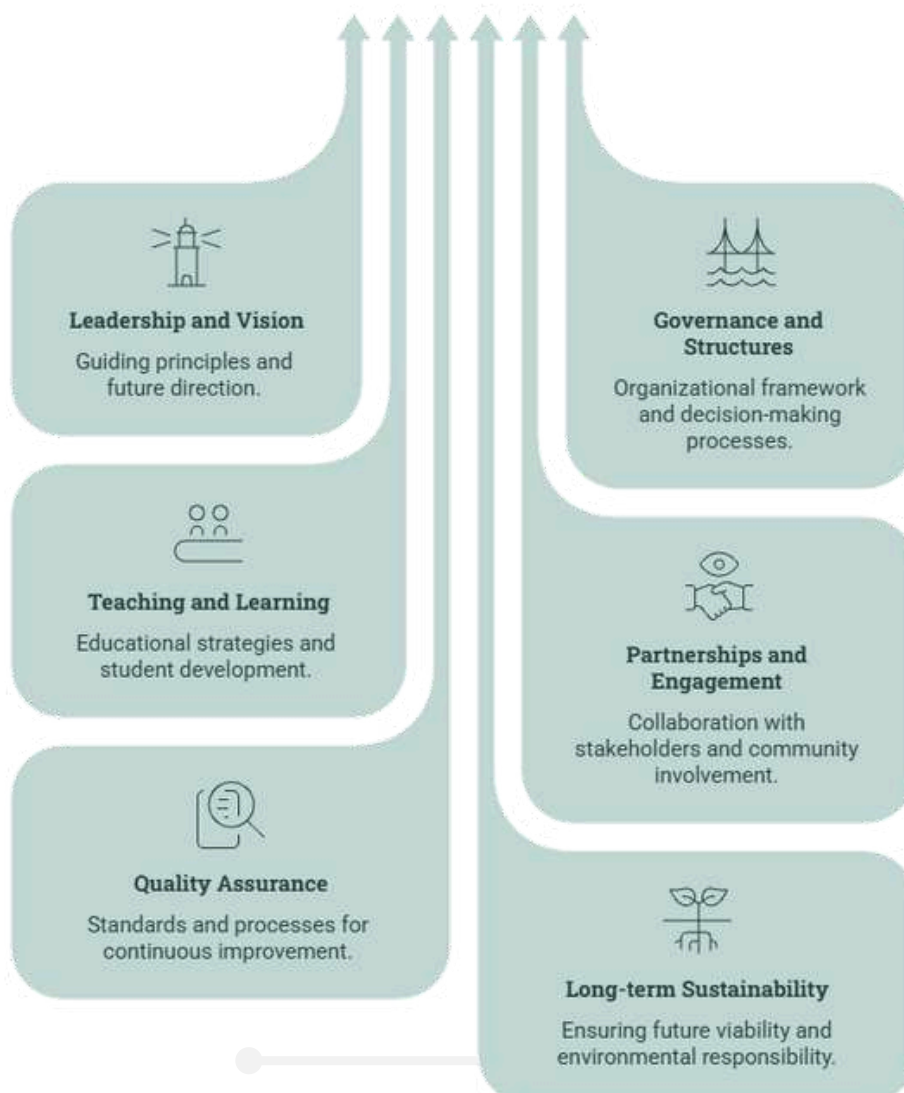
From Project Results to Institutional Practice

Many successful sustainability initiatives begin as temporary projects. Their long-term value depends on whether effective approaches become part of the institution's regular practices.

This transition requires institutions to review successful project outcomes, integrate effective approaches into policies and procedures, assign long-term responsibilities, provide appropriate resources, support professional development and regularly evaluate implementation. Through this process, sustainability evolves from a project objective into a permanent characteristic of institutional development.

Ultimately, long-term sustainability is not defined by the number of projects an institution implements but by its capacity to continuously learn, adapt and improve. Institutions that embed sustainability into their everyday structures create lasting value for learners, staff, partners and society while remaining resilient in times of change.

Pillars of Strategic Success



4. Anchoring Sustainability in Governance and Leadership

Establishing Sustainability as a Strategic Responsibility

Long-term sustainability requires more than successful projects. It depends on embedding sustainability into institutional leadership, governance and strategic decision-making. When sustainability becomes part of everyday management, it evolves from a temporary initiative into a permanent organisational principle.

Leadership provides the strategic vision and creates the conditions for continuous development. By communicating clear priorities and supporting innovation, institutional leaders encourage staff to integrate sustainability into teaching, administration and quality management.

Governance translates this vision into practice. Clearly defined responsibilities, transparent decision-making and structured planning ensure that sustainability is consistently considered across institutional activities. Integrating sustainability into strategic plans, quality assurance and regular management processes strengthens continuity beyond individual projects or staff members.

Shared responsibility further reinforces institutional ownership. School leaders, department heads, teachers, administrative staff and learners all contribute to achieving common sustainability goals. Regular reviews help institutions evaluate progress, respond to new challenges and continuously improve their practices. Ultimately, effective governance creates the stability needed for long-term institutional development and enables VET institutions to remain resilient, innovative and responsive to future change.

Erasmus+ VET Sustainability Governance Framework



5. Securing Resources, Responsibilities and Partnerships

Building the Capacity for Long-term Sustainability

Long-term sustainability depends on the institution's ability to provide the necessary resources, define clear responsibilities and build strong partnerships. These elements create the organisational capacity needed to sustain innovation beyond individual projects.

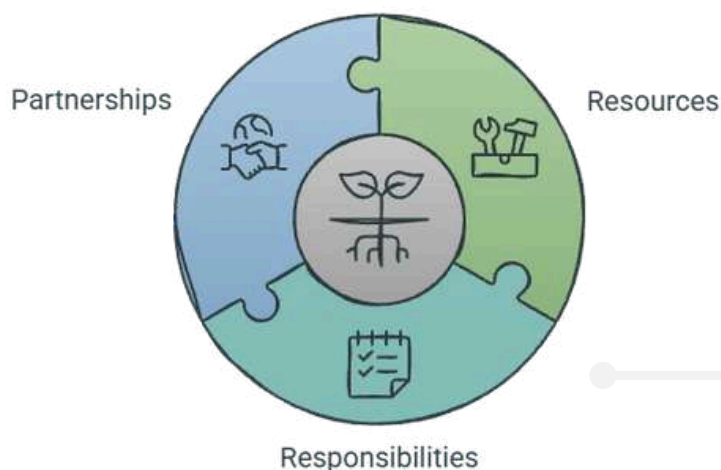
Clear roles ensure that sustainability is embedded across the institution. While leadership provides strategic direction, responsibilities should be shared among sustainability coordinators, department heads, teachers, administrative staff and quality management teams. Assigning ownership to specific tasks strengthens accountability and supports continuity over time.

Sustainable development also requires appropriate resources. Institutions should allocate time, funding and professional development opportunities to support implementation and continuous improvement. Integrating sustainability into annual planning and budgeting helps ensure that strategic ambitions are translated into everyday practice.

Partnerships with employers, public authorities, higher education institutions and community organisations further strengthen institutional resilience. External stakeholders contribute expertise, practical learning opportunities and valuable feedback, while collaboration with learners encourages participation and shared ownership of sustainability goals.

Regular communication between all stakeholders promotes transparency, builds trust and supports collective decision-making. By combining sufficient resources, clearly defined responsibilities and effective partnerships, VET institutions establish the organisational capacity needed to maintain sustainability as a permanent part of institutional development.

Erasmus+ VET Workbook Framework



6.Reviewing Progress and Institutional Impact

Continuous improvement is essential for ensuring that sustainability remains relevant and effective over time. Regular review enables institutions to assess progress, measure the impact of implemented actions and identify new priorities for development.

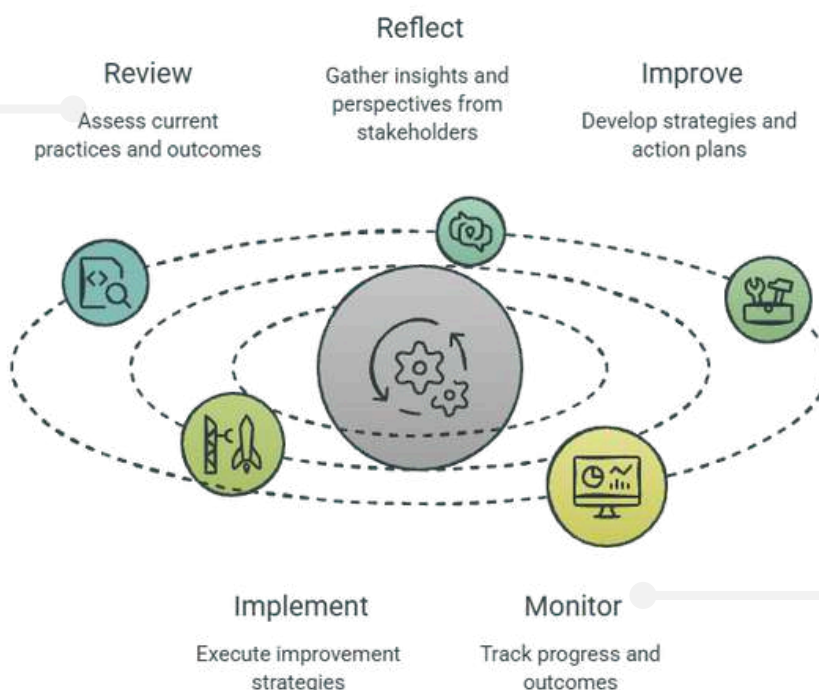
Monitoring should combine quantitative and qualitative evidence. Indicators such as participation rates, resource use, stakeholder feedback and the achievement of strategic objectives provide valuable information about institutional performance. Equally important are reflections from staff, learners and external partners, which help identify strengths, challenges and opportunities that may not be visible through numerical data alone.

Review processes should be integrated into existing quality assurance systems rather than creating additional administrative tasks. Annual evaluations, management reviews and sustainability reports provide structured opportunities to analyse results, celebrate achievements and agree on future actions.

The purpose of evaluation is not only accountability but also organisational learning. Institutions that regularly reflect on their experiences become more adaptable, strengthen their resilience and are better prepared to respond to emerging environmental, social, digital and economic challenges.

Long-term sustainability is therefore achieved through an ongoing cycle of reviewing, learning and improving, ensuring that sustainability remains an active part of institutional development.

The Continuous Improvement Cycle



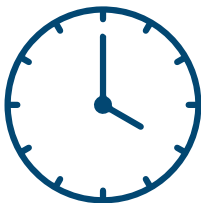


Tool A

Sustainability Anchoring Check

Purpose

The Sustainability Anchoring Check provides a rapid overview of how well sustainability is currently embedded within the institution. It helps leadership teams identify strengths, recognise areas requiring further development and establish priorities for long-term institutional improvement.



When to use

Use this tool at the beginning of the institutional sustainability planning process or as part of an annual review. It is particularly valuable before defining governance structures, developing action plans or evaluating institutional progress.

Who should be involved

- School leadership
- Sustainability coordinator
- Quality management representatives
- Department heads
- Administrative staff
- Teacher representatives

How to use

- Review each assessment area collaboratively.
- Discuss the current level of implementation using the four-point rating scale.
- Record key observations and supporting evidence.
- Identify the three priority areas requiring further development.
- Use the results to inform the Sustainability Governance Canvas (Tool 2).



Expected Outcome

A shared understanding of the institution's current level of sustainability integration and an agreed set of priorities that provide the foundation for governance planning and continuous improvement.

How to use

Use this self-assessment to evaluate how well sustainability is currently embedded within your institution. Discuss each area collaboratively and identify the priorities that require further development.

ASSESSMENT SCALE

☐ Not yet
 ☐ Emerging
 ☐ Established
 ☒ Fully Embedded

01 VISION & STRATEGY

Is the sustainability embedded in the institutional strategy?

☐ Not yet
 ☐ Emerging
 ☐ Established
 ☐ Fully Embedded

02 LEADERSHIP

Does leadership support sustainability?

☐ Not yet
 ☐ Emerging
 ☐ Established
 ☐ Fully Embedded

03 GOVERNANCE

Are responsibilities clearly defined?

☐ Not yet
 ☐ Emerging
 ☐ Established
 ☐ Fully Embedded

04 TEACHING & LEARNING

Is the sustainability integrated in the educational practice?

☐ Not yet
 ☐ Emerging
 ☐ Established
 ☐ Fully Embedded

05 RESOURCES

Are sufficient time, budget and staff available?

☐ Not yet
 ☐ Emerging
 ☐ Established
 ☐ Fully Embedded

06 PARTNERSHIP

Do external stakeholders actively contribute?

☐ Not yet
 ☐ Emerging
 ☐ Established
 ☐ Fully Embedded

07 MONITORING

Is progress reviewed regularly?

☐ Not yet
 ☐ Emerging
 ☐ Established
 ☐ Fully Embedded

08 INSTITUTIONAL CULTURE

Is the sustainability part of everyday organisational practice?

☐ Not yet
 ☐ Emerging
 ☐ Established
 ☐ Fully Embedded

PRIORITY AREAS FOR ACTION

PRIORITY 1

FIRST ACTION

What is the immediate next step?

PRIORITY 2

RESPONSIBLE PERSON

Who will lead this priority?

PRIORITY 3

TARGET DATE

When should this be completed?

Tool B

Sustainability Governance Canvas

Purpose

The Sustainability Governance Canvas supports leadership teams in translating the findings of the Sustainability Anchoring Check into a coherent governance framework. It helps define strategic priorities, assign responsibilities and establish the organisational structures needed to embed sustainability into everyday institutional practice.



How to use

- Review the priority areas identified in Tool 1.
- Work through each section of the canvas collaboratively.
- Define a shared vision and strategic goals for sustainability.
- Assign clear responsibilities and identify the resources required.
- Determine indicators that will be used to monitor progress.
- Agree on a regular review cycle to ensure continuous implementation.

Expected Outcome

A shared governance framework that clearly defines leadership responsibilities, strategic priorities, resource allocation and monitoring mechanisms, providing the organisational foundation for long-term sustainability.



Good Practice Tips

- Build on existing governance structures instead of creating parallel systems.
- Ensure that responsibilities are shared across leadership, teaching and administrative teams.
- Focus on a small number of realistic priorities before expanding activities.
- Integrate sustainability into existing quality management and school development processes.
- Review the governance framework regularly and adapt it as institutional needs evolve.

How to use

Use this canvas collaboratively to define how sustainability will be embedded into your institution's governance structures and long-term development. Complete each field as a leadership team, drawing on your strategic priorities and institutional context.

VISION

Long-term sustainability direction for the institution

STRATEGIC GOALS

Measurable objectives

LEADERSHIP

Who leads, champions, and sponsors sustainability efforts

RESPONSIBILITIES

Roles, mandates, and accountability structures

RESOURCES

Budget, staff capacity, time and infrastructure

STAKEHOLDERS

Key internal and external actors to engage

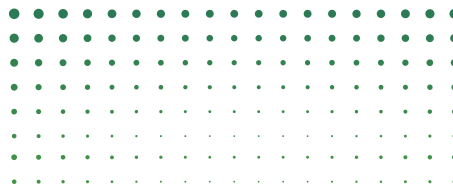
INDICATORS

How progress and impact will be measured?

REVIEW CYCLE

Frequency and process for governance review

NOTES / KEY DECISIONS



Tool C

Annual Sustainability Review

Purpose

The Annual Sustainability Review enables institutions to evaluate their progress, reflect on implementation experiences and assess the impact of sustainability initiatives over the past year. It provides a structured framework for evidence-based reflection and supports continuous organisational learning.



How to use

- Review the sustainability goals and actions implemented during the previous period.
- Document key achievements and identify areas where progress has been limited.
- Gather evidence and reflect on feedback from staff, learners and external partners.
- Identify lessons learned that can strengthen future implementation.
- Agree on priorities that should guide the next planning cycle.

Expected Outcome

A shared understanding of institutional progress, supported by evidence and stakeholder feedback, together with clearly identified priorities that inform future governance decisions and action planning.



Good Practice Tips

- Base discussions on evidence rather than individual opinions.
- Celebrate achievements while openly addressing challenges.
- Involve different stakeholder perspectives to obtain a balanced evaluation.
- Focus on continuous improvement rather than perfection.
- Document lessons learned to strengthen institutional memory and support future planning.

How to use

Use this worksheet at the end of each academic year to reflect collectively on sustainability progress. Work through each area with your leadership team and use the insight to shape your plan for the year ahead.

01 ACHIEVEMENTS

What sustainability milestones did we reach this year?

02 CHALLENGES

Where did we face resistance or fall short of our goals?

03 STAKEHOLDER ENGAGEMENT

How effectively did we involve staff, students and partners?

04 RESOURCE ALLOCATION

Were time, budget and staff used effectively for sustainability?

05 LEARNING & ADAPTATION

What did we learn and how we adjusted our approach?

06 PRIORITIES FOR NEXT YEAR

What are the three most important sustainability focuses ahead?

OVERALL REFLECTION

OVERALL RATING

How would you rate this year overall?

KEY LESSON LEARNED

What single insight shapes the year ahead?

COMMITMENT FOR NEXT YEAR

What do we commit to improving?

FACILITATOR

DATE

INSTITUTION

Tool D

Continuous Improvement Plan

Purpose

The Continuous Improvement Action Plan helps institutions translate reflection into concrete action. Building on the findings of the Annual Sustainability Review, it supports leadership teams in defining realistic priorities, assigning responsibilities and planning measurable actions that strengthen sustainability over time.



How to use

- Review the priorities identified during the Annual Sustainability Review.
- Select the actions that are both strategically important and realistically achievable.
- Assign clear responsibilities and establish an implementation timeline.
- Identify the resources required to support implementation.
- Define measurable indicators that will demonstrate success.
- Schedule a follow-up review to monitor progress and update the action plan as necessary..

Expected Outcome

A realistic, shared and measurable action plan that guides institutional sustainability work, clarifies responsibilities and supports continuous improvement through regular monitoring and review.



Good Practice Tips

- Focus on a limited number of high-impact actions rather than an extensive list of initiatives.
- Assign clear ownership for every action to ensure accountability.
- Set realistic timelines that fit existing institutional planning cycles.
- Define success indicators before implementation begins.
- Treat the action plan as a living document that is reviewed, updated and refined on a regular basis.

How to use

Work through the four stages of this action plan to address a single sustainability improvement area. Complete one plan per priority. Revisit and update at each review cycle to embed continuous improvement into institutional practice.

IMPROVEMENT AREA

1 DIAGNOSE IDENTIFY THE GAP

What area of sustainability needs improvement?
What evidence points to this gap?

CURRENT SITUATION Describe what is happening now

DESIRED OUTCOME What should it look like when improved

EVIDENCE/SOURCE What data or observation confirms this gap

2 PLAN IDENTIFY THE GAP

What area of sustainability needs improvement?
What evidence points to this gap?

CURRENT SITUATION Describe what is happening now

DESIRED OUTCOME What should it look like when improved

EVIDENCE/SOURCE What data or observation confirms this gap

3 IMPLEMENT TAKE ACTION

How will actions be tracked and supported during implementation?

RESPONSIBLE PERSON(S) Who leads this stage?

TIMELINE Start date Completion date

PROGRESS INDICATORS How will you know it is working?

4 REVIEW EVALUATE & EMBED

What was achieved? What needs to continue, adapt, or be discontinued?

RESULTS ACHIEVED What changed as a result of the actions?

LESSONS LEARNED What worked well and what did not?

NEXT CYCLE ACTION What should feed into the next improvement cycle?

CYCLE SUMMARY & SIGN-OFF

START DATE

END DATE

OVERALL STATUS

NEXT REVIEW DATE

RESPONSIBLE LEAD

APPROVED BY

INSTITUTION

7. Reflection

Why Reflection Matters

Sustainability is not achieved through isolated initiatives but through continuous learning, adaptation and collaboration. Reflecting on the planning process enables institutions to recognise achievements, understand challenges and identify opportunities for further development. Meaningful reflection strengthens collective ownership and supports evidence-informed decision-making.

Reflection Questions

Take a moment to discuss the following questions with your team.

- Which insights from this workbook were most valuable for our institution?
- Which strengths can we build on in the coming years?
- Which challenges require further attention?
- How has our understanding of institutional sustainability changed?
- Which stakeholders should be more actively involved in future initiatives?
- What will be our first priority after completing this workbook?

Looking Ahead

Completing this workbook is not the end of the process. Sustainable institutional development requires regular reflection, ongoing collaboration and the willingness to review and adapt decisions as circumstances evolve. Returning to these questions on a regular basis helps ensure that sustainability remains an integral part of institutional development rather than a one-time project.

8. The X-VET Continuous Improvement Cycle

Sustainability Is a Journey

Embedding sustainability within a VET institution is an ongoing process rather than a single achievement. Changing societal needs, technological developments and environmental challenges require institutions to continuously review their strategies, strengthen partnerships and adapt their practices.

The tools presented in this workbook support a structured cycle of assessment, planning, implementation and reflection. Repeating this cycle on a regular basis enables institutions to respond proactively to emerging challenges while strengthening their organisational resilience and educational quality.

Institutional sustainability is most effective when it becomes part of everyday decision-making, leadership practices and organisational culture. Continuous improvement therefore depends not only on strategic planning but also on collaboration, shared responsibility and a commitment to learning.

Key Messages

- Sustainability is a continuous institutional development process.
- Leadership and shared responsibility are essential for lasting change.
- Regular review enables evidence-informed decision-making.
- Collaboration strengthens innovation and long-term impact.
- Small, consistent improvements create sustainable transformation over time.

Final Thoughts

Every institution begins its sustainability journey from a different starting point. There is no single model for success. What matters is a clear commitment to continuous learning, collaborative leadership and the willingness to review, adapt and improve. By embedding these principles into everyday institutional practice, VET providers can build resilient organisations that are better prepared for future challenges while creating lasting value for learners, staff and their wider communities.

Sustainability is not a destination—it is a continuous commitment to learning, collaboration and improvement.



Part IV – Best Practices and Case Studies



The X-VET partners have collected practices from VET institutions across Europe that bring the Framework and the Process Model to life. Three are presented here in depth; ten more follow in brief; and the full collection — with implementation materials and contacts — is available online. Cases are presented in anonymised form. Use them not as blueprints but as proof of feasibility and as raw material for your own adaptation: every case ends with what made it transferable.

4.1 Three Practices in Focus

CASE 1 — FROM DISCARDED BATTERIES TO A WORKING PROTOTYPE: STUDENT-LED CIRCULAR ECONOMY INNOVATION

Austria · higher technical college (HTL) · Project-based learning & entrepreneurship — Competences 2, 3, 4 · Steps 1, 3, 5, 8

CONTEXT

Five students at HTL Dornbirn identified a specific waste problem hiding in plain sight: emergency lighting batteries are discarded by regulation while still holding 80–90% of their capacity, and affordable solar storage solutions remain scarce. Rather than treating this as a theoretical case study, the students took it on as a real engineering brief within their curriculum.

WHAT THE EVIDENCE SHOWS

The prototype won 1st Prize in the Sustainability category at Jugend Innovativ 2023 (€2,500) and a 2nd Place Special Award for Vorarlberg (€1,000), validated externally through a national competition rather than only through internal assessment. Faculty and students report the project served as a genuine proof of concept for circular battery reuse, with the team going on to consider patenting and company formation — a sign the learning translated into something students judged viable beyond the classroom. Media coverage and public presentation of the prototype extended that validation beyond the competition itself.



Martina Maksimović, Valeria Maksimović, Angelina Bauer, Mathias Mähr und Philipp Schiemer mit ihren Solar-Batterien aus alten Akkus

THE PRACTICE

The team built ReCell, a modular solar battery storage system made entirely from recycled emergency lighting batteries, collected directly from local companies. The work spanned the full innovation cycle: designing a drawer-based modular housing that allows individual cells to be swapped out, developing a custom Battery Management System to handle safety, monitoring and cell replacement, and constructing and testing a multi-kWh prototype. The project sat inside HTL Dornbirn's project-based learning structure, combining hands-on electrical engineering and safety testing with early-stage business and commercialisation planning — treating the technical build and the path to market as one connected task rather than separate exercises.

WHY IT TRANSFERS

The mechanism here is a real, unresolved industry problem handed to students as a project-based brief, backed by technical infrastructure, expert supervision, and an external competition framework that supplied structure, funding and visibility. That last element matters for replication: Jugend Innovativ did much of the work of legitimising the project and giving it momentum, so colleges without an equivalent competition ecosystem may need to build that scaffolding themselves. The case also flags real limits — battery reuse carries high safety requirements and needs advanced technical supervision, and replicability elsewhere depends on consistent access to a waste stream and the equipment to test and document safely. This is a model for the type of learning (real-problem, project-based, industry-linked), not a plug-and-play template independent of those conditions.

CASE 2 — FROM SCATTERED INTERNSHIPS TO A SYSTEMIC MODEL: EMBEDDING WORK-BASED LEARNING FOR THE GREEN TRANSITION

Italy · post-diploma technical institute (ITS) · Curriculum & partnerships — Competences

CONTEXT

A Lombardy-based technical institute specialising in energy, environment and sustainable building found that traditional post-secondary pathways left a persistent gap: companies needed specific, up-to-date green technical skills that standard curricula weren't producing. Interest from both students and employers was strong, but nothing structural connected classroom learning to real labour-market demand.

WHAT THE EVIDENCE SHOWS

The institute reports a job-placement rate of up to 98% of graduates finding work coherent with their studies, alongside stable multi-year course offerings (running through 2025–2027) that suggest the model has held rather than being a one-off success. Student testimonials consistently cite the value of learning directly from working professionals as what made courses feel applicable rather than theoretical. The 900-hour internship structure is documented as a fixed, non-negotiable part of the design — not a bolt-on.



THE PRACTICE

The institute built its two-year programmes around a single organising principle: curricula co-designed with companies from the outset, not adapted afterward. Year one combined technical modules, labs and project-work with structured encounters with employers. Year two shifted almost entirely to in-company placements — around 900 hours — under joint supervision from a company tutor and an institute tutor. Teaching staff were recruited directly from industry (98% of instructors are sector professionals), keeping content aligned with current technology and regulation rather than static syllabi. Orientation, tutoring and job-placement support ran alongside the technical track to help students convert training into employment.

WHY IT TRANSFERS

The model's core mechanism — co-designing curricula with employers, then testing that design through sustained internships rather than short placements — is transferable to other sectors, even though this case is built around a narrow specialisation (energy, environment, sustainable building). The main conditions for replication are visible in the case itself: it depends on genuine employer commitment (to help design curricula, not just host interns) and on real labour demand in the target sector, so contexts with weaker industry absorption will need to adapt the intensity of the internship component. Ongoing curriculum revision — to keep pace with evolving technology and regulation — also has to be built in as a standing process, not treated as a one-time redesign.



CASE 3 – FROM SUMMER CAMP TO CAREER PATHWAY: CLOSING THE GENDER GAP IN GREEN TECHNICAL EDUCATION

*Slovakia (with Greece, Spain, Italy, Portugal) · Centre of Vocational Excellence network · Access & inclusion –
Competences 7, 9 · Steps 6, 9*

CONTEXT

The renewable energy sector in Slovakia faces two problems that reinforce each other: a shortage of skilled technicians, particularly in green heating and solar, and a persistent underrepresentation of women in technical VET pathways. Standard recruitment into "dirty" mechanical trades wasn't reaching a whole pool of potential students who might otherwise be drawn to the sector's climate relevance.

WHAT THE EVIDENCE SHOWS

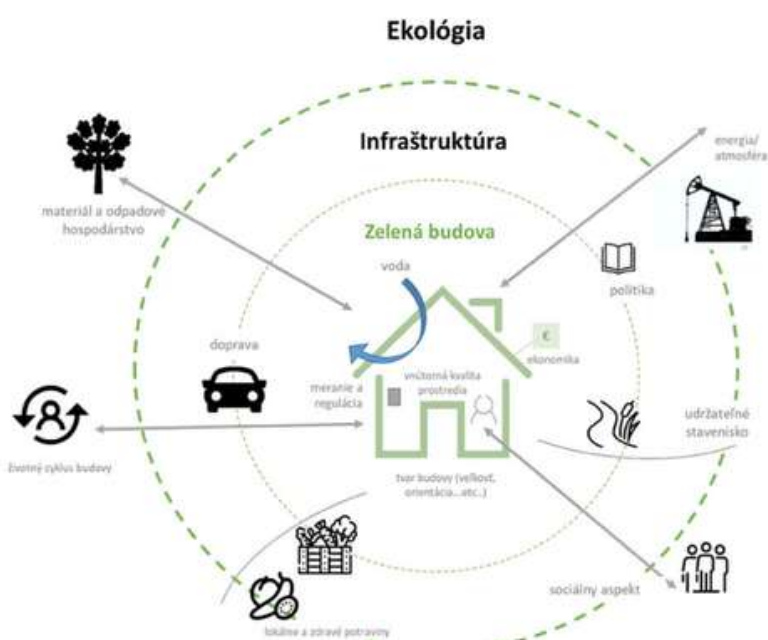
Students presented genuine project work on green and blue infrastructure by the end of the camp, and the programme is reported to have increased enrolment interest in technical VET among applicants who wouldn't traditionally have considered it. Qualitative feedback suggests the "blue and green" framing – positioning technical VET as a climate-action tool rather than a mechanical trade – was what shifted how participants saw the sector. This is documented through the SECOVE Roadmap and institutional reporting under the Erasmus+ framework.

THE PRACTICE

As part of the wider SECOVE network spanning VET hubs across Slovakia, Greece, Spain, Italy and Portugal, the Slovak strand ran an Immersive Summer VET Academy aimed specifically at introducing young girls to high-tech green architecture and renewable energy systems. Over a two-week camp, students moved from lectures on climate change, pollution and waste management to site visits at some of the country's greenest administrative buildings, then into hands-on workshops. The core method was a "Green Challenge": students used energy-modelling software to design architectural elements that minimise carbon footprint, learning inquiry-based rather than through instruction alone. Senior ambassadors – professors and industry leads – worked as mentors specifically to debunk stereotypes about technical work, giving participants visible role models rather than only content.

WHY IT TRANSFERS

The mechanism worth replicating is the reframing itself: pairing an inclusion goal (reaching girls and non-traditional applicants) with an interdisciplinary hook (biology and climate urgency alongside engineering) made the subject relatable in a way a standard technical pitch hadn't. That reframe, plus visible mentors who counter stereotypes directly, is transferable to other national contexts with similar gender gaps. The case also surfaces its own limit clearly: the camp works well as an extracurricular intervention, but folding it into the regular school year runs into rigid state curriculum requirements. The practice's own lesson is to formalise it early as an optional module rather than assume it will migrate into core curriculum on its own – worth planning for before treating this as a scalable, permanent fixture rather than a recurring seasonal programme.



4.2 Ten More from the Collection

Each box summarises one further practice from the partner collection; the online library holds the full write-ups.

Energy dashboard as a teaching tool

Latvia · technology institute

Live building data streams into maths, science and installation lessons; learners analyse real consumption and propose savings.

→ C5 · C9 · Step 8

Green procurement, rewritten

Poland · vocational school cluster

Sustainability criteria embedded in purchasing rules; learner teams audit suppliers as part of business modules.

→ C9 · Step 10

Teacher Green Academy

Greece · regional VET provider

A 30-hour CPD pathway on sustainability pedagogy, closing with a micro-credential and a redesigned module from each participant.

→ C4 · Step 4

Sustainability Week, co-created

Italy · technical institute

An annual campus-wide challenge festival designed with the learner council; departments compete on real

→ C6 · Steps 2, 9

Digital-twin workshop simulations

France · building-trades lycée

Learners commission installations virtually before touching real systems, cutting material waste and raising first-time quality.

→ C5 · Step 5

Waste-to-workshop materials loop

Slovenia · wood-technology school

Offcuts are logged, graded and re-issued across departments; scrap volumes and reuse rates are tracked termly.

→ C9 · Step 6

Monthly community repair café

Croatia · crafts & services school

Learners repair household items for the public; every repair becomes assessed evidence in their portfolios.

→ C7 · Steps 6, 9

Stackable green micro-credentials

Czechia · engineering VET centre

Short certified units on energy, circularity and digital tools, co-designed with employers and recognised in hiring.

→ C3 · Steps 5, 8

Rooftop PV as a living lab

Spain · electrical-trades college

Learners monitor yield, plan maintenance and present performance publicly – the array doubles as curriculum and evidence.

→ C4 · C9 · Step 4

Whole-staff sustainability induction

Germany · vocational academy

Every new colleague – teaching and non-teaching – completes a sustainability onboarding module, refreshed annually.

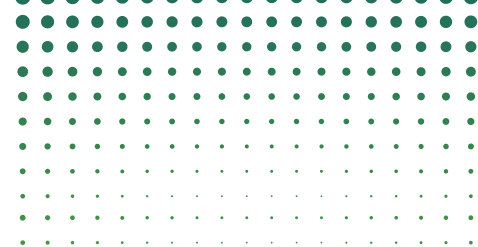
→ C1 · C8 · Step 10

References

- 1.AccountAbility. (2015). AA1000 Stakeholder Engagement Standard (AA1000SES). AccountAbility.
<https://www.accountability.org/standards/aa1000-stakeholder-engagement>
- 2.Association for the Advancement of Sustainability in Higher Education (AASHE). (2023). Sustainability Tracking, Assessment & Rating System (STARS) Technical Manual. <https://stars.aashe.org>
- 3.Bacigalupo, M., Brande, G. V. d., Kampylis, P., & Punie, Y. (2016). EntreComp: The entrepreneurship competence framework. Publications Office.
<https://doi.org/10.2791/593884>
- 4.Bacigalupo, M., & O'Keeffe, W. (Eds.). (2018). EntreComp into action – Get inspired, make it happen. Publications Office.
<https://data.europa.eu/doi/10.2760/574864>
- 5.Bianchi, G., Pisiotis, U., & Cabrera Giraldez, M. (2022). GreenComp – The European sustainability competence framework. Publications Office of the European Union (JRC128040).
- 6.Cedefop & UNESCO-UNEVOC. (2025). Meeting skill needs for the green transition: Skills anticipation and VET for a greener future (Cedefop practical guide 4).
- 7.Council of the European Union. (2022). Council Recommendation of 16 June 2022 on learning for the green transition and sustainable development (2022/C 243/01). Official Journal of the European Union, C 243, 1–9.
- 8.Council Recommendation of 24 November 2020 on vocational education and training for sustainable competitiveness, social fairness and resilience.
- 9.European Centre for the Development of Vocational Training (Cedefop). Work-based learning in Europe: Practices and policy pointers. Publications Office of the European Union.
- 10.European Commission. (2019). The European Green Deal (COM(2019) 640 final).
- 11.European Commission. (2020). European Skills Agenda for sustainable competitiveness, social fairness and resilience (COM(2020) 274 final).
- 12.European Commission. (2025). Union of Skills.
- 13.European Commission: Directorate-General for Education, Youth, Sport and Culture, Technopolis Group, & 3S. (2024). GreenComp in practice: Case studies on the use of the European competence framework – Analytical report (Z. Javorka, L. Nieth, E. Marinelli, L. Sutinen, & M. Auzinger, Eds.). Publications Office of the European Union. <https://data.europa.eu/doi/10.2766/053738>
- 14.European Commission: Joint Research Centre. (2022). GreenComp, the European sustainability competence framework. Publications Office of the European Union. <https://data.europa.eu/doi/10.2760/13286>
- 15.European Training Foundation (ETF). (2020). Greening technical and vocational education and training: A practical guide for institutions. ETF.

References

16. Gadomska-Lila, K., et al. (2023). The importance of green competencies in advancing organizational sustainability. Sustainable Development.
17. International Organization for Standardization. (2010). ISO 26000: Guidance on social responsibility. <https://www.iso.org/standard/42546.html>
18. International Organization for Standardization. (2018). ISO 21001: Educational organizations – Management systems for educational organizations – Requirements with guidance for use.
19. International Organization for Standardization. (2026). Stakeholder engagement guidance. <https://www.iso.org/files/live/sites/isoorg/files/store/en/PUB100269.pdf>
20. Jambo. (2024, January 19). Understanding the AA1000 Stakeholder Engagement Standard. <https://www.jambo.cloud/blog/aa1000ses-stakeholder-engagement-standard>
21. Kemmler, J., & Schelenz, L. (2024). Artificial intelligence and education for sustainable development: Reflections on an ethical and sustainable approach to AI in school education. *Lehren & Lernen*, 50(6), 7–10.
22. OECD. (2020). *OECD Learning Compass 2030*.
23. Organisation for Economic Co-operation and Development. (2020). *Education for Sustainable Development in Action*. OECD Publishing.
24. Organisation for Economic Co-operation and Development. (2022). *OECD guidelines for citizen participation processes*. <https://www.oecd.org/gov/open-government/guidelines-for-citizen-participation-processes/>
25. Organisation for Economic Co-operation and Development. (2023). *The State of Global Education: Trends and Future Challenges*. OECD Publishing.
26. Phaal, R., Farrukh, C. J. P., & Probert, D. R. (2004). Technology roadmapping – A planning framework for evolution and revolution. *Technological Forecasting and Social Change*, 71(1–2), 5–26. [https://doi.org/10.1016/S0040-1625\(03\)00072-6](https://doi.org/10.1016/S0040-1625(03)00072-6)
27. Schaltegger, S., et al. (2023). Corporate change agents for sustainability: Transforming organizations. *Journal of Business Ethics*.
28. Sterling, S. (2001). *Sustainable Education: Re-Visioning Learning and Change*. Green Books.
29. Sterling, S. (2024). *Learning and sustainability in dangerous times* [Webinar]. International Association of Universities.



References

10. UNESCO. (2017). Greening technical and vocational education and training: A practical guide for institutions.
31. UNESCO. (2020). Education for sustainable development: A roadmap.
<https://unesdoc.unesco.org/ark:/48223/pf00000374802>
32. UNESCO. (2021). Reimagining our futures together: A new social contract for education.
33. UNESCO. (2022). Work-based learning and the green transition. Inter-Agency Working Group on Work-based Learning.
34. UNESCO. (2024). Green school quality standard: Greening every learning environment.
35. UNESCO. (2024). Greening curriculum guidance: Teaching and learning for climate action.
36. UNESCO-UNEVOC. (2021). Greening technical and vocational education and training: A practical guide for institutions.
37. United Nations. (2015). Transforming our world: The 2030 Agenda for Sustainable Development.
38. United Nations Educational, Scientific and Cultural Organization. (2017). Education for sustainable development goals: Learning objectives.
39. Vuorikari, R., Kluzer, S., & Punie, Y. (2022). DigComp 2.2: The Digital Competence Framework for Citizens. Publications Office of the European Union (JRC128415).
40. Wals, A. E. J. (2015). Beyond unreasonable doubt: Education and learning for socio-ecological sustainability in the Anthropocene.
41. Wals, A. (2024). Rethinking education for a more sustainable future [Webinar]. International Association of Universities.
42. X-VET. (2026). The joint transnational (European) integrated sustainability competences framework & workbook – Parts three and four.