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TRAINING KIT

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Chapter 1: Understanding the Background of Quality Assurance in the EU

Learning outcomes

In this chapter, you will learn about the EU's coordinating role in education policies and understand the importance of the key frameworks for promoting a widely shared approach towards quality assurance in the European Education Area.

You will understand the importance and forms of cross-border cooperation between EU Member States, associated countries, social partner organizations, and the European level and you will be able to use your knowledge to navigate the existing networks and tools for quality assurance in VET.

You will be able to integrate European approaches and initiatives for quality assurance in VET into the national QA strategy for Armenia and/or work with them in an Armenian VET organization.

The European Union (EU) has no legislative power in the entire field of education. Education policy, whether general education, higher education, or vocational education and training, is fundamentally the responsibility of the individual Member States. The EU has no authority to enact binding laws regulating national education systems.

However, the EU does have important supporting and coordinating powers: According to Articles 165 and 166 of the Treaty on the Functioning of the European Union (TFEU), the EU can:

- promote cooperation between member states,
- support the exchange of best practices - e.g., on quality assurance,
- provide mobility programs such as Erasmus+,
- promote international transnational cooperation projects,
- facilitate the recognition of qualifications and degrees,
- develop common educational objectives
- but without compromising national educational sovereignty.

The EU supports education quality and mobility for learners and teachers, but only in complementing Member States' efforts.

This coordinating role of the EU in education policy means that all declarations adopted at European level have only the character of recommendations for the Member States. This naturally also applies to all standards, guidelines, and indicators for managing the quality of vocational education and training (VET). They do not prescribe how quality assurance processes have to be implemented, but they intend to provide guidance, covering the areas, which are vital for successful quality provision, learning environments and stakeholder cooperation in VET.

The EU approach to quality assurance in VET should also be considered in a broader context, due to efforts to create a common European Education Area (EEA). Key frameworks for promoting the European education area are:

- EQF – the European Qualification Framework, where the Europe-wide qualifications are mapped in an eight-level reference frame intending to make degrees and qualifications comparable amongst Member States. The focus on comparability ensures that learners and professionals can navigate European educational systems and labour markets with greater ease, fostering both mobility and opportunity.

- ECVET – the European Credit System for VET, which serves to make education and training content comparable in order to support the mobility of learners through mutual recognition of acquired competences and skills.

It is essential to acknowledge that these frameworks and instruments not only serve as technical tools but also as enablers of closer collaboration across borders. By aligning educational systems and fostering a shared understanding of quality and learning outcomes, the EU strengthens the foundation for a dynamic educational landscape. This alignment facilitates better communication among institutions, employers, and learners, thereby expanding opportunities for personal and professional growth.

The EU is characterized by its diversity of political systems, education systems in general and VET systems in particular, socio-cultural and educational traditions, languages, aspirations and expectations. This makes a single monolithic approach to quality and quality assurance in the EU education systems inappropriate. The EU frameworks and instruments may be used and implemented in different ways in different Member States, by accreditation agencies and VET institutions. Broad acceptance of all approaches is a precondition for creating common understanding of quality and quality assurance all over Europe. For these reasons, the EU frameworks are at a reasonably generic level ensuring that they are applicable to all forms of provision.

VET institutions aim to fulfil multiple purposes, including preparing students for their professional careers, contributing to their employability, supporting their personal development, creating a broad advanced range of knowledge, skills, and competences, stimulating the regional and national economy, and promoting cohesion in the society. Therefore, national stakeholders and VET institutions who may prioritize different purposes, can view quality and quality assurance differently and the EU approach to quality assurance needs to take into account these different perspectives.

This flexibility allows Member States to tailor the EU frameworks to their unique socio-economic contexts while still benefiting from the shared vision of enhancing educational quality across Europe. By encouraging collaboration, exchange of experiences and good practices, the EU's approach creates avenues for Member States to experiment with best practices and adapt successful models to their own needs.

The **integration of digital technologies** within VET frameworks has emerged as a critical factor in modernizing the European education systems. Digital tools not only enhance the delivery of education but also facilitate the creation of robust quality assurance mechanisms. They enable the collection of students‘ feedback, and analysis of data on learning outcomes, helping institutions identify areas of improvement. At the same time, these innovations encourage

inclusivity by making education accessible to diverse groups of learners, including those in remote or underprivileged areas.

At European level, the European Council adopted two recommendations on digital education and skills:

COUNCIL RECOMMENDATION of 23 November 2023 on the key enabling factors for successful digital education and training (C/2024/1115)

https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:C_202401115

COUNCIL RECOMMENDATION of 23 November 2023 on improving the provision of digital skills and competences in education and training (C/2024/1030)

https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:C_202401030

These recommendations invite EU countries to develop national strategies for digital education and skills, to work closely with stakeholders, to invest in digital equipment, infrastructure, tools and content and to encourage targeted training to support teachers in the use of digital technologies in teaching and learning. At national level, many Member States have adopted system-level strategies related to digital education with a strong focus on teachers and trainers' digital competences and literacy.

By integrating **green skills** into curricula and fostering awareness of sustainable practices, VET institutions can prepare learners for emerging sectors while contributing to the EU's broader sustainability agenda. This approach not only enhances employability but also underscores the role of VET in addressing global challenges.

The EU's emphasis on **lifelong learning** further complements its quality assurance initiatives. As the nature of work evolves due to technological advancements and global economic shifts, continuous upskilling and reskilling have become paramount. VET institutions, supported by EU frameworks, play a pivotal role in equipping individuals with the competencies needed to thrive in this dynamic landscape, thereby contributing to both personal development and societal progress.

At the heart of all quality assurance activities are the twin purposes of accountability and improvement. A successfully implemented QA-system will provide information to demonstrate the quality of the VET institution's activities and services provided to its customers, as well as provide advice and recommendations on how the institutions might improve the quality of its services and activities.

This dual focus on accountability and improvement is especially relevant in an era where globalization and technological advancements are reshaping the educational and vocational landscapes. Institutions are expected to respond not only to local and national priorities but also to international benchmarks and standards, ensuring they remain competitive and relevant.

The EU frameworks encourage a culture of continuous evaluation, improvement and adaptation. Accreditation, regular peer reviews and cross-border collaborations provide valuable insights that help refine educational strategies.

1.1 EQAVET

Source: EQAVET 2024

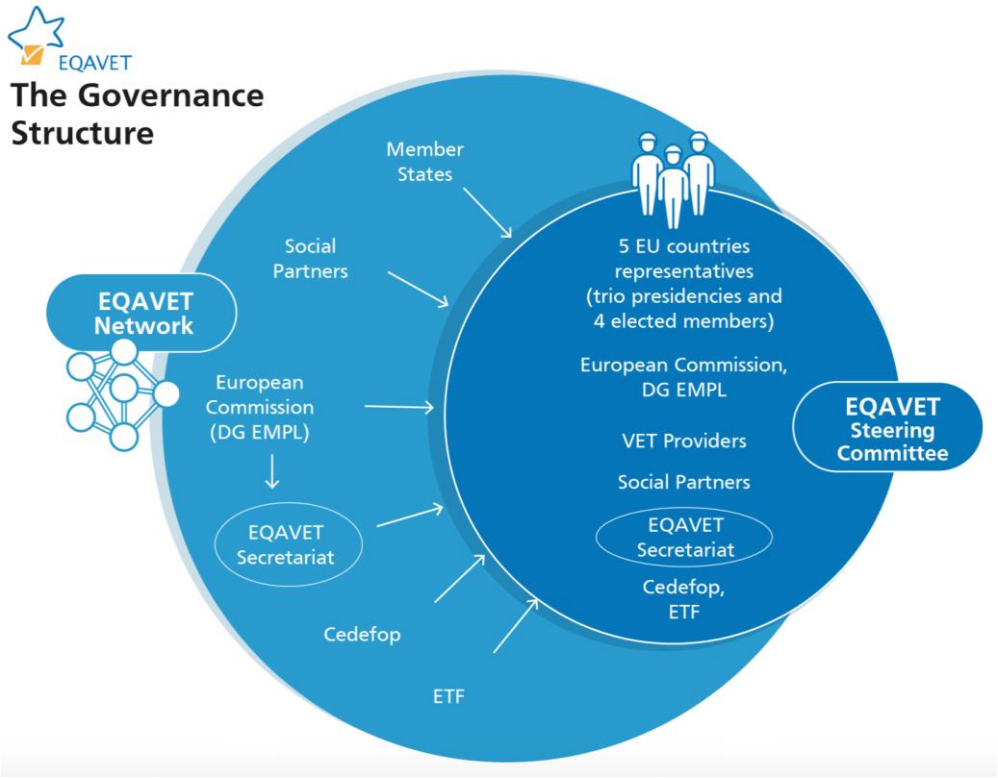
In October 2005, the first joint platform of the European Member States for the promotion of quality assurance, called ENQA-VET (European Network for Quality Assurance in Vocational Education and Training), was established. Its aim was to develop a common understanding of quality in VET and approaches to quality assurance, and to promote transnational exchange on various quality assurance methods.

The European Network for Quality Assurance in Vocational and Training (ENQAVET), established in 2005, was a network of representatives with expertise in quality assurance from Member States and social partners. By exchanging mutual experiences and identifying common European-wide standards, the network developed the tools and frameworks that became the basis for a more formalized system of quality assurance in VET at European level. The Recommendation on a European Quality Assurance Reference Framework for Vocational Education and Training (EQAVET) adopted by the European Parliament and Council in 2009, was a direct outcome of the ENQAVET cooperation, with the ENQAVET network itself transitioning into the EQAVET Network, which continues to foster collaboration and implementation of the framework.

RECOMMENDATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 18 June 2009 on the Establishment of a European Quality Assurance Reference Framework for Vocational Education and Training (2009/C 155/01)

https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32009H0708(01)

To date, EQAVET's current members are the 27 EU Member States, the EEA countries Iceland, Liechtenstein, and Norway, as well as the accession candidates Croatia and Turkey. The following illustration on the governance structure of EQAVET provides an overview of the partners involved and how cooperation is organized in practical terms.

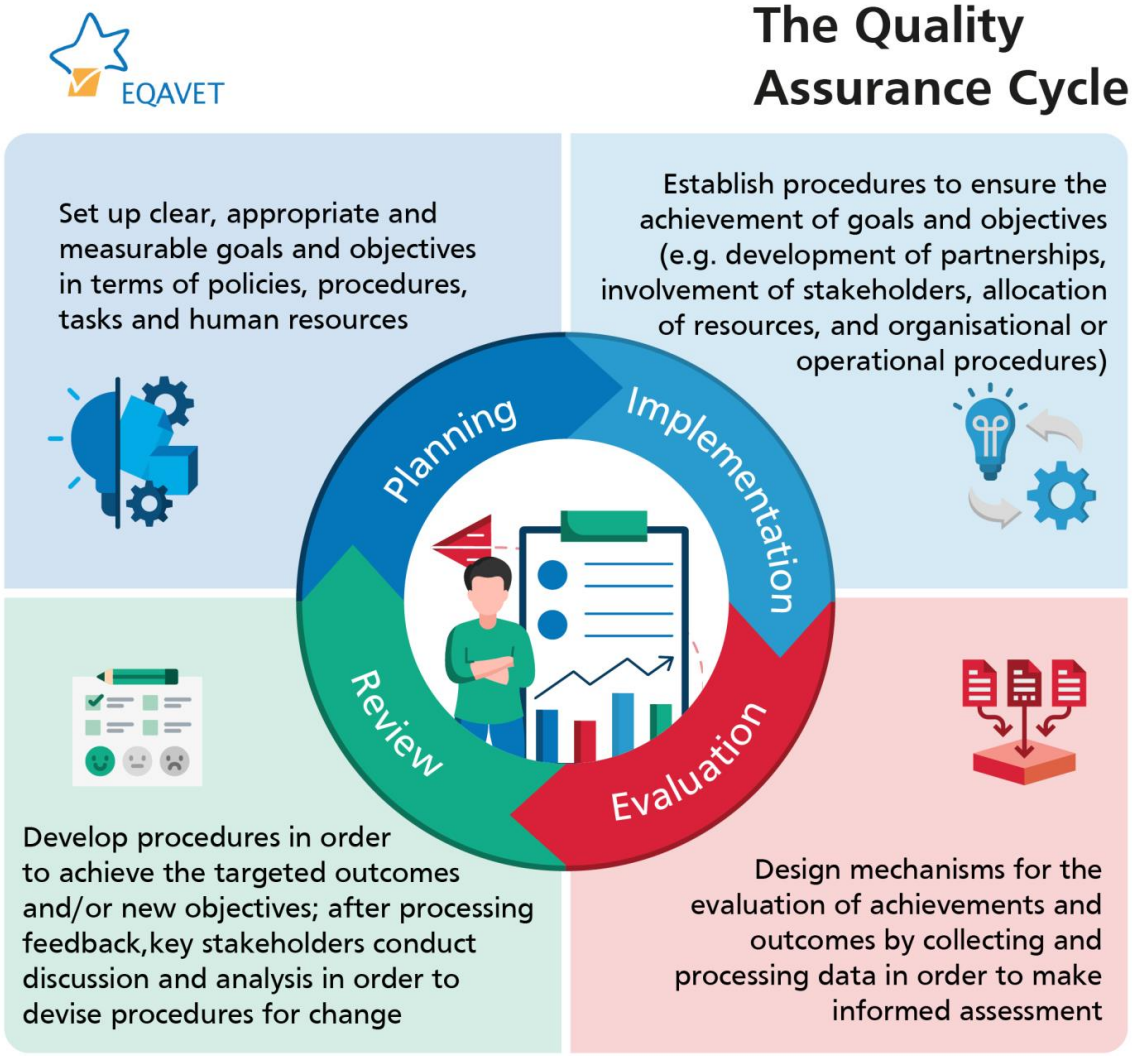


Source: European Commission 2024

EQAVET's main objective is to develop a common European-wide understanding of quality through exchange of experiences and good practice examples between Member States, social partner organisations, VET provider organisations, and the European Commission together with its technically responsible agencies (CEDEFOP, ETF). Participation in this process is voluntarily, and its main principle is subsidiarity, which means that it is up to each Member State to follow the European reference framework or to apply its own approach in measuring and ensuring the quality of VET. By providing a platform for dialogue and mutual learning, EQAVET enables stakeholders to align their objectives while respecting the unique educational traditions and strategies of each Member State.

The jointly and step-by-step developed European Reference Framework (see the above EU Recommendation cited above) is aiming to ensure that VET systems across Europe meet high-quality standards but is open at same time to the specific needs of individual Member States. The EQAVET reference framework is a flexible approach to quality assurance, thus supporting the Member States to remain responsive to evolving labour market demands.

The Quality Assurance Cycle (PDCA) is the commonly shared and guiding principle for understanding quality assurance, encompassing the four phases of planning, implementation, evaluation, and improvement.



Source: European Commission 2024, p. 4

In the EQAVET approach to quality assurance specific indicators are assigned to each phase of the PDCA cycle.

The ten reference indicators according to the European Reference Framework are:

1. Relevance of quality systems for vocational training providers
2. Investments in the initial and continuing training of teachers and trainers
3. Participation rate in vocational training programs
4. Completion rate of participants in vocational training programs
5. Placement rate for graduates of vocational training programs
6. Use of acquired skills in the workplace
7. Unemployment rate
8. Prevalence of particularly vulnerable groups (unemployed, handicapped, socially marginalized)

9. Mechanisms for identifying vocational training needs in the labour market

10. Programs to enhance access to vocational training, especially for vulnerable groups.

The same indicators can be used to measure the quality of provision at the system and provider levels. In many contexts, there are agreements on the definitions of these indicators and how data is collected. This enables information from individual VET providers to be collated and analysed in order to provide system level data.

EQAVET also includes so-called "building blocks" as a tool for independent quality assurance and development.

The EQAVET Building Blocks

Source: European Commission 2024

The "building blocks" are aimed at both the system and provider levels and are based on ten guidelines. These guidelines are intended to demonstrate how quality in vocational education and training can be ensured and developed, for example, by clarifying the question of responsibilities.

Reminder

If you attended the QA4VET project kick-off meeting in Vardenis, you should be already familiar with the EQAVET building blocks, as they served as the basis for presenting the status and challenges of internal quality assurance in the EU.

To refresh your knowledge of the building blocks, you can watch the mentioned presentation on the QA4VET project website.

References

European Commission (2024) EQAVET – European Quality Assurance in Vocational Education and Training.

https://employment-social-affairs.ec.europa.eu/policies-and-activities/skills-and-qualifications/working-together/eqavet-european-quality-assurance-vocational-education-and-training_en

European Commission (2024) EQAVET Governance.

https://employment-social-affairs.ec.europa.eu/policies-and-activities/skills-and-qualifications/working-together/eqavet-european-quality-assurance-vocational-education-and-training/eqavet-governance-and-work-programme_en

European Commission (2024) EQAVET Quality Cycle.

https://employment-social-affairs.ec.europa.eu/policies-and-activities/skills-and-qualifications/working-together/eqavet-european-quality-assurance-vocational-education-and-training_en

1.2 ENQA – European Association for Quality Assurance

The European Association for Quality Assurance in Higher Education (ENQA) was established in 2000 to improve quality assurance across the European Higher Education Area (EHEA). Although ENQA focuses mainly on higher education, its principles and methods also benefit vocational education and training (VET) by encouraging shared standards and international cooperation.

ENQA brings together quality assurance agencies from EHEA countries, as well as associate and affiliate members worldwide. Its main goal is to promote high-quality education through the Standards and Guidelines for Quality Assurance in the EHEA (ESG)—first adopted in 2005 and revised in 2015. The ESG provides a flexible framework for both internal and external quality assurance, emphasizing accountability, continuous improvement, and stakeholder engagement.

The ESG framework covers three main areas:

1. Internal Quality Assurance – Institutions regularly review and improve programs to meet stakeholder needs. In VET, this means aligning curricula with labor market demands, incorporating skills such as digital literacy or sustainability practices. For example, an Armenian VET school could add green technology or digital skills training to stay relevant to EU priorities.

2. External Quality Assurance – Independent agencies conduct evaluations such as accreditations, audits, or peer reviews to ensure institutions meet quality standards. In VET, this may involve checking that qualifications match the European Qualifications Framework (EQF), enabling cross-border recognition. For Armenia, external ESG-compliant reviews can make VET programs more attractive to international partners.

3. Quality Assurance of Agencies – ENQA and the European Quality Assurance Register (EQAR) review quality assurance agencies themselves to ensure they follow ESG standards. This builds trust in evaluation results and ensures qualifications are comparable across Europe. For Armenia, ESG-compliant agencies give VET programs stronger international credibility.

ENQA also supports collaboration through workshops, peer reviews, and working groups, allowing members to share best practices. This indirectly benefits VET by promoting approaches such as stakeholder involvement and outcome-based evaluation.

1.3 EQAR - European Quality Assurance Register

The European Quality Assurance Register for Higher Education (EQAR) was launched in 2008 as part of the Bologna Process to promote trust and transparency in quality assurance across the EHEA. Like ENQA, it focuses on higher education but also plays a key role in improving VET recognition and cooperation.

EQAR maintains a public register of quality assurance agencies that comply with ESG standards. To join the register, agencies undergo rigorous external reviews. This guarantees the credibility of their evaluations.

EQAR's main contributions:

1. Transparency – Provides a searchable platform (including the DEQAR database) to verify agency credibility and accreditation results. For Armenia, working with EQAR-registered agencies boosts employer trust and aligns with national transparency policies.

2. Mobility – Ensures qualifications are recognized across borders by using consistent ESG-based evaluations. Armenian VET graduates with EQAR-accredited qualifications can more easily work or study in EU countries.

3. Accountability – Agencies on the register are reviewed regularly to ensure ongoing ESG compliance. In Armenia, this strengthens VET program quality and responsiveness to labor market needs.

Armenia has been an EQAR member since 2008, showing commitment to European integration despite challenges like limited resources and geopolitical tensions.

Digital and Green Competences in ENQA and EQAR

The EU prioritizes digital skills (e.g., digital literacy, data analysis, technology use) and green skills (e.g., sustainability, environmental awareness) as part of building a unified European Education Area.

ENQA and EQAR help ensure these competences are integrated and recognized:

- ENQA: Internal QA encourages embedding digital and green competences in learning outcomes; External QA verifies these programs meet ESG standards; Innovation projects support digital credentials and new training methods.

- EQAR: Transparency allows stakeholders to verify programs with these competences; Mobility supports cross-border recognition; Accountability ensures agencies maintain credible evaluation processes.

For Armenia, adopting ENQA/EQAR-aligned quality assurance supports modern VET curricula, boosts employability, and strengthens global recognition.

References

https://www.eqar.eu/

https://www.enqa.eu/

Chapter 2: European experiences in external quality assurance

In this material, you will gain insights into the external quality assurance processes in Vocational Education and Training (VET) across Europe and appreciate the significance of key frameworks, such as the European Quality Assurance Framework for VET (EQAVET), in fostering a cohesive approach to quality enhancement within the European Education Area.

You will understand the importance and diverse forms of cross-border cooperation among EU Member States, associated countries, social partner organizations, and European institutions, and you will be equipped to navigate the existing networks and tools for quality assurance in VET.

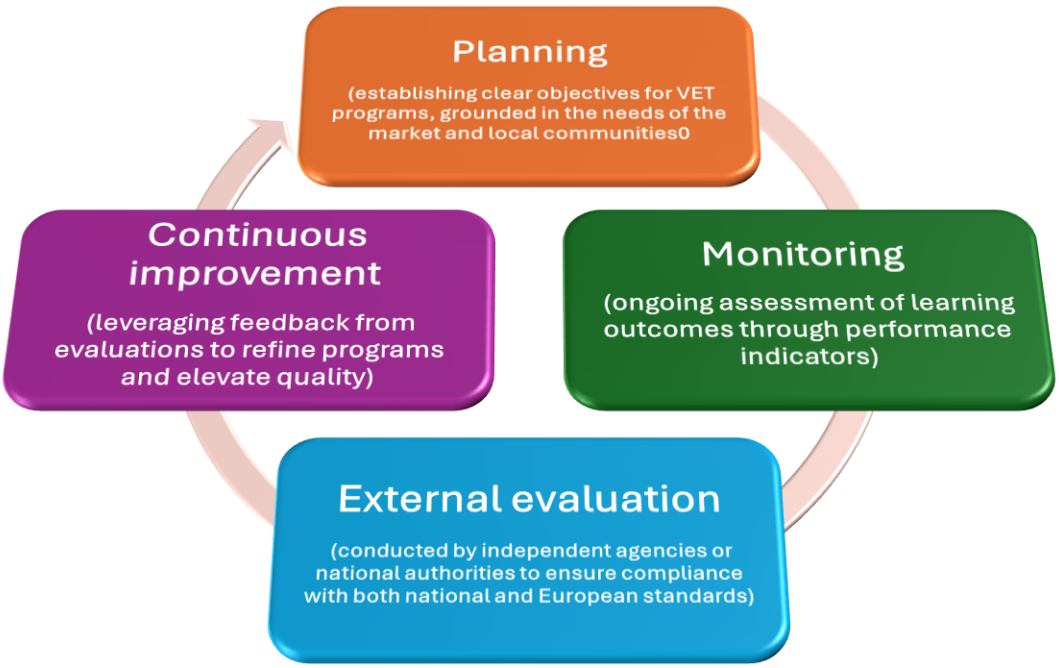
You will be able to integrate European approaches and initiatives for quality assurance in VET into the national quality assurance strategy for Armenia and/or apply them effectively within an Armenian VET organization.

The external quality assurance of Vocational Education and Training (VET) across Europe represents a vital process for upholding educational standards and aligning them with the demands of the labour market. European experiences in this field are diverse, yet they share common frameworks and practices, rooted in the recommendations and standards set by the European Union. Below, we outline key aspects and pertinent examples of external quality assurance in VET, with a focus on European perspectives:

2.1. The European Quality Assurance Framework for VET (EQAVET)

The European Quality Assurance Framework for Vocational Education and Training (EQAVET) serve as a cornerstone instrument developed by the European Union to enhance quality and transparency within VET. It provides a set of principles, quality indicators, and descriptors to guide member states in implementing external quality assessments.

- **Key Indicators:** EQAVET encompasses metrics such as the employment rate of graduates, satisfaction levels among stakeholders (students and employers), access to continuous training, and the alignment of programs with labor market needs.
- **Core Processes:**



The European Quality Assurance Framework for VET (EQAVET)

For example, in Finland, the external evaluation of VET is managed by the Finnish National Agency for Education (EDUFI), which applies EQAVET-based standards. This process involves regular inspections, interviews with students and employers, and analysis of graduate performance data. The insights gained are used to adjust curricula and strengthen collaboration with the private sector.

2.2. National Models of External Quality Assurance

Each European country tailors its external quality assurance approach to its national context, though many share common practices, such as engaging stakeholders (employers, students, teachers) and adhering to clear standards.

- Romania: the external quality assurance of VET is overseen by the Romanian Agency for Quality Assurance in Pre-University Education (ARACIP). The process includes:
    - Verification of compliance with national quality standards (e.g., institutional capacity, school effectiveness, quality management).
    - Evaluation visits conducted by teams of 2-4 assessors, who review documents, observe activities, and interview relevant actors (students, teachers, employers).

- Types of evaluation: provisional authorization (prior to operation), accreditation (following a full educational cycle), and periodic review (every five years).

- Norway: A recent study has underscored the value of authentic workplace assessments in VET. Examinations feature practical teaching in VET schools, observed by teachers and supervisors, followed by written reflections on the experience. This approach has demonstrated greater coherence between theory and practice, though logistical challenges (e.g., time allocation for observation) persist.

The role of stakeholders

A critical element of external quality assurance in VET is the active involvement of stakeholders, particularly employers and local communities, ensuring the relevance of educational programs.

- The Netherlands (the Dutch VET system emphasizes collaboration with employers during external evaluations. Regional training centers (ROC) undergo periodic assessments by educational inspectorates, which incorporate feedback from partner companies regarding graduates' competencies).
- Austria (external evaluations include inspections of VET institutions by regional authorities, verifying alignment with occupational standards defined by social partners (unions and employers).

Challenges and Best Practices

- **Challenges:**
  - **Standardization vs. flexibility (**some countries struggle to balance uniform standards with the specific needs of local labor markets).
  - **Limited resources: (i**n countries like Romania, the lack of financial and logistical resources can hinder the ability to conduct rigorous external evaluations)
  - **Resistance to change (**the adoption of modern evaluation methods (e.g., authentic assessment) often meets resistance from educators accustomed to traditional approaches)

Best practices:

Structured feedback (countries like Denmark employ digital platforms to gather feedback from students and employers, seamlessly integrating it into the external evaluation process)

Evaluator training (in Sweden, external evaluators undergo rigorous training to ensure objectivity and consistency in applying standards).

Authentic evaluation (Norway and Finland promote evaluations based on demonstrated competencies in real work environments, enhancing the practical relevance of VET)

5. Trends and innovations

- **Digitalization of evaluation** (across many countries, digital platforms are increasingly used to track student progress and streamline external evaluations, reducing both costs and time requirements).
- **Focus on lifelong learning** (external evaluations in VET are increasingly incorporating indicators related to graduates' access to continuous training, reflecting the need for adaptability in the labor market**).**
- **Transformational approach** (some nations, such as Norway, advocate for a transformational view of quality, emphasizing "value creation" (e.g., new competencies tailored to social changes) over purely procedural methods).

European experiences in the external quality assurance of VET reflect a delicate balance between European standardization (via EQAVET) and national contextual adaptation. Countries like Finland, and Norway exemplify best practices through employer feedback integration, authentic assessments, and close collaboration with social partners. In Romania, ARACIP plays a pivotal role, though challenges related to resources and labor market alignment persist. Enhancing quality will require greater employer involvement and the adoption of innovative methods, such as authentic assessments and digitalization.

This analysis draws on relevant insights grounded in the European context and the EQAVET framework.

Developed economies

Countries with developed economies (e.g., Finland, the Netherlands, Luxembourg) boast well-established VET systems, supported by robust financial and logistical resources, clear legislative frameworks, and strong private sector collaboration. These nations prioritize aligning competencies with labour market demands and fostering innovation in evaluation processes.

- **Luxembourg**

Luxembourg, home to one of Europe's most advanced economies, features a well-integrated VET system that blends formal education with workplace training, akin to the German dual model. The external quality assurance of VET is managed by the Ministry of Education, Children and Youth, Childhood, and Youth (MENJE) and adheres to EQAVET standards.

Luxembourg's system of Initial Vocational Education and Training (IVET) is built on a unique and e effective tripartite cooperation between: the Ministry of Education, Children and Youth; the Employers' Chambers (the Chamber of Commerce, the Chamber of Skilled Trades and Crafts & the Chamber of Agriculture); and the Chamber of Employees (https://men.public.lu/en.html).

This partnership ensures strong alignment between education and labour market needs, high relevance of qualifications, a smooth transition from school to employment.

External evaluation process

Responsible authority: the Vocational and Technical Education Service within MENJE oversees evaluations, collaborating with school inspectorates and social partners (e.g., chambers of commerce, unions).

Methodology: evaluations involve regular inspections of VET institutions, analysis of student performance data (e.g., graduation and employment rates), and employer feedback. Particular attention is given to apprenticeship programs, where external assessors verify the quality of practical training.

Quality indicators: these include student and employer satisfaction, curriculum alignment with market needs, and access to continuous training**.**

Role of employers: Chambers of commerce (e.g., Chambre de Commerce) play a vital role in setting occupational standards and assessing apprentices' practical skills.

- **Best Practices:**
  - **Curriculum flexibility:** VET programs are swiftly adapted to the needs of key sectors in Luxembourg, such as finance, IT, and logistics, reflecting its dynamic and diverse economy**.**
  - **Digitalization:** Luxembourg employs digital platforms to monitor student progress and collect real-time data, enhancing the efficiency of external evaluations.
  - **Cross-Border Collaboration:** due to its geographic position, Luxembourg collaborates with neighboring countries (France, Belgium, Germany) to align VET standards, particularly for cross-border trades.
- **Challenges:**
  - **Multilingualism:** The VET system must address the needs of a multilingual population (Luxembourgish, French, German), complicating standardization efforts.
  - **High costs:** funding practical training in small companies remains a challenge, even within a developed economy.

Finland

The Finnish Education Evaluation Centre (FINEEC) has been in operation since May 2014. It is a combination of three previous organisations: the Unit for learning outcomes at the Finnish National Board of Education, the Finnish Higher Education Evaluation Council at the Ministry of Education and Culture and the Finnish Education Evaluation Council.

All these previous organisations have a long history in evaluation: The development of the national learning outcomes assessment model began in the Board of Education in the mid-1990s, the Finnish Higher Education Evaluation Council at the Ministry of Education and Culture was established in 1995 and the Finnish Education Evaluation Council was established in 2003. Structure of inspectorate FINEEC is a separate unit responsible for the external

evaluation at all levels of education in Finland. When established, FINEEC was an independent government agency.

From 1st January 2018, FINEEC was attached to the organisation of the Finnish National Agency for Education as a separate unit. In practice, this means that FINEEC will retain financial and substance independence as an independent evaluation authority but will use the common support services of the administration of the National Agency.

FINEEC's organization is divided into four different units:

• General Education

• Vocational Education and Early Childhood Education

• Higher Education and Liberal Adult Education

• Development Services

(https://www.sici-inspectorates.eu/swfiles/files/SICI_InspectorateProfile_2024_Finland.pdf)

Finland's VET system is highly flexible, centering on the individual needs of students and labour market requirements**.**

- **External evaluation process:**
  - The Finnish National Agency for Education (EDUFI) conducts periodic external evaluations based on EQAVET**.**
  - The methodology combines inspections, student and employer surveys, and analysis of learning outcomes data.
  - Emphasis is placed on authentic assessment, where competencies are evaluated in real-world work contexts.
- **Best practices:**
  - **Personalized learning plans:** students follow individualized pathways, with external evaluations assessing their suitability**.**
  - **Evaluator training:** evaluators receive thorough training to ensure objectivity and consistency.
- **Challenges:**
  - **Logistical costs:** authentic evalustions require significant time and resources for workplace observations**.**
  - **Rapid adaptation:** technological sectors demand frequent curriculum updates.

Developing economies

Countries with developing economies (e.g., Romania, Poland, Bulgaria) face resource constraints but are making significant strides in aligning VET systems with European standards. These nations rely heavily on external funding (e.g., EU funds) and prioritize structural reforms.

- **Romania** has taken important steps to modernize its VET system but lags behind developed countries in terms of infrastructure and employer engagement**.**

- **External Evaluation Process:**
  - The Romanian Agency for Quality Assurance in Pre-University Education (ARACIP) conducts external evaluations for authorization, accreditation, and periodic monitoring (every five years) of VET institutions.
  - The methodology includes evaluation visits, document analysis (e.g., curricula, activity reports), and interviews with students, teachers, and employers.
  - Indicators focus on institutional capacity, educational effectiveness, and quality management.
- **Best Practices:**
  - EU-Funded Programs: European funds (e.g., POCU) have supported curriculum modernization and teacher training.
  - Employer Partnerships: some VET schools collaborate with local companies for practical training, dual training, though this is limited in rural areas.
- **Challenges:**
  - **Limited resources:** the lack of modern infrastructure and qualified trainers impacts training quality**.**
  - **Low employer engagement:** collaboration with the private sector is inconsistent, particularly in less developed industries.
  - **VET stigmatization:** professional education is often perceived as a lower-tier option, reducing program attractiveness.

- **Poland**

Poland has implemented significant VET reforms, supported by EU funds, to meet the demands of a growing economy.

- **External evaluation Process:**
  - Evaluations are carried out by regional education inspectorates, applying national standards aligned with EQAVET.
  - Indicators assessed include graduate employment rates, the quality of practical training, and employer feedback.
  - Some regions utilize digital platforms to monitor student progress**.**
- **Best Practices:**
  - Employer Collaboration: Poland has forged strong partnerships with companies in sectors like IT and manufacturing, contributing to external evaluations.
- **Challenges:**
  - **Regional Disparities: VET quality varies significantly between urban and rural areas.**

- **Curriculum Updates: Adapting programs to new technologies is slow in some sectors.**

- **Bulgaria**

  Bulgaria faces challenges similar to Romania's but has made progress in integrating EQAVET standards.

  - **External Evaluation Process:**
    - The Ministry of Education and Science, alongside regional agencies, conducts external evaluations based on indicators such as student performance and labor market alignment.
    - Evaluations involve inspections and annual institutional reports.
  - **Best Practices:**
    - **Pilot Programs:** Bulgaria has introduced pilot projects for authentic assessments, inspired by Nordic models**.**
    - **EU Funding:** European funds have supported VET infrastructure modernization.
  - **Challenges:**
    - **Shortage of Qualified Trainers:** Many VET institutions lack teachers with practical experience.
    - **Low Employment Rates:** VET graduates sometimes struggle to find relevant jobs.

Comparison Between Developed and Developing Economies

Aspect	**Developed Economies (e.g., Luxembourg, Finland)**	**Developing Economies (e.g., Romania, Poland, Bulgaria)**
Financial and logistical Resources	Abundant; modern infrastructure, consistent investments in digitalization and training.	Limited; reliance on EU funds, outdated infrastructure in many cases.
Employer involvement	Close collaboration with the private sector; well-defined occupational standards (e.g., Chambre de Commerce in Luxembourg).	Limited and inconsistent involvement; employer collaboration is evolving.
External evaluation methodology	Advanced methods: authentic evaluatin digital platforms, structured feedback (e.g., Finland).	Developing methods; digitalization is in early stages.
Quality indicators	Focus on outcomes (employment rates,	Emphasis on compliance (infrastructure,

	employer satisfaction, adaptability).	documentation); labor market outcomes are important but harder to track.
Challenges	Slow digitalization in some instances, integration of disadvantaged groups.	Limited resources, VET stigmatization, regional disparities tied to economic development.
Best practices	Authentic evaluation, cross-border collaboration (Luxembourg).	EU-funded programs, regional centers of excellence (Poland), pilot projects (Bulgaria).

Developed economies (Luxembourg, Finland) benefit from abundant resources, strong employer partnerships, and innovative evaluation methods (e.g., authentic assessment, digitalization). Luxembourg stands out for its curriculum flexibility and cross-border collaboration, driven by its dynamic economy and strategic location. Developing economies (Romania, Poland, Bulgaria) are progressing but face constraints related to resources, infrastructure, and employer engagement. Reforms backed by EU funds and the gradual adoption of EQAVET standards are crucial for advancement.

In-depth analysis: external quality assurance in VET in Poland, Romania and the Netherlands

1. **Poland:**

Context and Approach to External Quality Assurance in VET Poland, as a developing economy, has made significant strides in aligning its VET system with European standards, supported by EU funds and structural reforms. The VET system, managed by the Ministry of National Education, encompasses professional schools, apprenticeship programs, and continuous training. External evaluations focus on enhancing program relevance for the labor market, with growing emphasis on digitalization and sustainability.

- **Institutional Framework and External Processes:**

Regional education inspectorates (Kuratoria Oświaty) and the EQAVET National Reference Point (NRP), under the Ministry of Education, coordinate evaluations. These involve periodic assessments of VET institutions based on EQAVET indicators, such as graduate employment rates, employer satisfaction, and curriculum alignment with market needs.

Evaluations include school inspections, data analysis (e.g., from the national monitoring system SIO - System Informacji Oświatowej), interviews with students, teachers, and employers, and European peer reviews. For instance, Poland hosted the Annual Network Meeting (ANM) of EQAVET in Warsaw in June 2025, attended by 64 representatives from 32 countries. Here, Poland showcased systemic measures to boost VET effectiveness and relevance, including ETF self-assessment tools like ISATCOVE for identifying quality actions. Discussions covered EU updates, such as the Basic Skills Action Plan and Cedefop studies on key competencies (digital, entrepreneurial).

- **Best practices:**

Poland fosters regional partnerships with companies (e.g., in IT and manufacturing), where employers contribute to evaluations through feedback on practical training. VET centers of excellence (e.g., in Mazovia) are rigorously assessed to ensure alignment with occupational standards.

National platforms collect real-time data for monitoring, reducing bureaucratic hurdles in evaluations.

Emphasis on supporting neurodiversity in VET, aligned with OECD recommendations from 2025.

- **Challenges:**

VET quality is higher in urban areas (e.g., Warsaw) than in rural regions with limited resources.

Collaboration is growing but remains inconsistent, especially in smaller sectors.

Low employment rates in some fields necessitate more frequent external evaluations for timely adjustments.

2. Romania:

Context and Approach to External Quality Assurance in VET Romania, as a developing economy, has made notable progress in modernizing its VET system, supported by EU funds and structural reforms, though it lags behind developed nations in infrastructure and employer involvement. The Romanian VET system, managed by the Ministry of Education, includes professional schools, apprenticeship programs, and continuous training. External evaluations focus on enhancing program relevance for the labor market, with emphasis on digitalization, sustainability, and alignment with European EQAVET standards.

- **Institutional Framework and External Processes:**

The Romanian Agency for Quality Assurance in Pre-University Education (ARACIP) conducts external evaluations for authorization, accreditation, and periodic monitoring (every five years) of VET institutions. The process is coordinated under the Ministry of Education and incorporates EQAVET indicators, such as graduate employment rates, employer satisfaction, and curriculum alignment with market needs. ARACIP collaborates with the National Reference Point (NRP) for European alignment**.**

Evaluations involve visits, document analysis (e.g., curricula, activity reports), interviews with students, teachers, and employers, and peer reviews. The process relies on teams of 2-4 evaluators and focuses on indicators like student performance and employer feedback.

- **Best Practices:**

Romania promotes regional partnerships with companies (e.g., in IT and manufacturing), where employers provide feedback on practical training. VET centers of excellence are rigorously evaluated for occupational alignment, supported by POCU (Operational Program Human Capital) projects.

National platforms, including the ARACIP platform, collect real-time data for monitoring, reducing bureaucracy, in line with OECD recommendations on education and skills in Romania.

Focus on supporting neurodiversity and vulnerable groups in VET.

Challenges:

VET quality varies between urban and rural areas, with limited resources in the latter.

Collaboration is inconsistent, particularly in smaller sectors

Low employment rates in some fields require more frequent external evaluations for timely adjustments.

3. The Netherlands:

Context and Approach to External Quality Assurance in VET The Netherlands, with a developed economy and a well-integrated VET system (MBO - Middelbaar Beroepsonderwijs), prioritizes innovation, digitalization, and collaboration with the private sector. The system is decentralized, with regional institutions (ROC - Regionale Opleidingscentra) subject to external evaluations to ensure flexibility and labor market relevance.

- **Institutional Framework and External Processes:**

The Education Inspectorate (Inspectie van het Onderwijs) and the EQAVET National Reference Point (NRP) manage external evaluations. These are based on EQAVET and include indicators such as student performance, employer feedback, and data-driven continuous improvement.

Evaluations involve periodic inspections, data analysis (e.g., from national dashboards), workshops, and external audits.

The Netherlands focuses on data-driven quality assurance (datagedreven QA), with pilot projects for predictive data (e.g., preventing school dropout). A January 2025 report highlights external sources like CBS (socio-economic data) and DUO (national benchmarks) for contextualizing evaluations. Collaboration with the Ministry of Education and MBO Raad promotes European knowledge to inspire institutions.

- **Best practices:**

Institutions use real-time dashboards, integrating external feedback from companies and alumni into evaluations.

Emphasis on competencies demonstrated in the workplace, with employer involvement in practical exams.

Alignment with EQAVET 2024-2026 priorities for expanding quality assurance across all VET sectors.

- **Challenges:**

Many schools are in the exploratory phase of data policy (databeleid), leading to underutilization of data.

Despite advanced systems, integrating AI requires additional evaluator training**.**

Data-Driven innovation in VET: definition and implications

Data-driven innovation refers to the systematic collection, analysis, and interpretation of data to guide decision-making, optimize activities, and foster new or improved solutions across various fields, including education, particularly Vocational Education and Training (VET). In the context of external quality assurance in VET, this approach involves leveraging both quantitative and qualitative data to monitor, evaluate, and enhance educational program

performance, their alignment with labor market needs, and stakeholder satisfaction (students, teachers, employers).

- **What Data-Driven innovation entails in VET:**

    1. **Relevant data collection:**
        - Quantitative data: graduation rates, graduate employment, participation in internships, training costs.
        - Qualitative data: feedback from students, teachers, and employers, program satisfaction, observations from inspections.
        - External sources: socio-economic statistics, labor market data (e.g., skill demand), national or international platform data**.**
    2. **Data Analysis and interpretation:**
        - Use of tools like digital dashboards, analysis software , or integrated platforms for real-time processing.
        - Identification of trends, weaknesses, and opportunities (e.g., school dropout risks, emerging training needs).
    3. **Data-Informed decision-making:**
        - Curriculum adjustments to meet market demands (e.g., introducing digital skills in VET).
        - Resource optimization (e.g., allocating budgets to high-impact programs).
        - Problem prevention: employing predictive data to reduce dropout rates.
    4. **Innovation through data:**
        - Development of new teaching or assessment methods (e.g., authentic evaluation based on workplace data).
        - Creation of personalized programs for students, informed by individual needs analysis.
        - Adoption of emerging technologies, such as artificial intelligence (AI), to anticipate market requirements.

Poland: data-driven innovation is emerging, supported by EU funds and recent reforms. Examples include:

- **SIO Platform (System Informacji Oświatowej)** is a centralized digital system collects data on student performance, practical training outcomes, and evaluation results, guiding regional inspections**.**
- Integration of ETF tools like ISATCOVE for self-assessment and quality analysis allows VET institutions to identify weaknesses. At the June 2025 EQAVET Annual Network Meeting, Poland showcased data use to promote digital sustainability in VET.
- Data monitors access for vulnerable groups (e.g., neurodiverse students), informing curriculum adjustments.

- **Benefits of data-driven innovation in VET:**
    1. External evaluation processes become faster and more precise with real-time data.
    2. VET programs align better with labour market needs through data-driven insights on skill demand.
    3. Data provides an objective basis for feedback and decisions, reducing subjectivity.
    4. Quick identification of gaps enables the introduction of new teaching methods or technologies (e.g., AI, VR for training).
- **Challenges of data-driven innovation:**
    1. Incomplete or inaccurate data can skew decisions.
    2. Handling sensitive data (e.g., student performance) requires GDPR compliance.
    3. Limited digital infrastructure and teacher training slow adoption.
    4. Developing and maintaining digital platforms demands significant investment.

2.3. The Role of the ARACIP Platform in collecting VET school data (https://calitate.aracip.eu)

This online system is dedicated to ensuring quality in pre-university education, including VET, where schools report data for self-assessment, accreditation, and external evaluations. The platform facilitates standardized data collection to align with national standards and European indicators.

VET schools (e.g., technological high schools, professional schools) register on the platform and submit mandatory annual reports (e.g., Annual Internal Evaluation Report). Data includes student/enrollment numbers, exam results, student/employer feedback, internship statuses, equipment, and curriculum alignment. Reporting is digital, using predefined forms, conducted annually.

Quantitative data (e.g., graduate employment rates targeting EQAVET >50%; PISA/national performance) and qualitative (e.g., satisfaction surveys, employer interviews). For VET, specific data on internships and company partnerships (e.g., IT, automotive) is collected.

Integration with External Evaluation: data is analyzed by ARACIP teams during evaluation visits (2-4 evaluators), producing evaluation reports combined with on-site verified data. Results are publicly available on the platform, enhancing transparency.

The platform provides dashboards for schools (to view their own performance) and ARACIP (for aggregated analysis).

ARACIP PLATFORM for internal and external school evaluation: https://calitate.aracip.eu

The aim of this platform is supporting educational institutions in internal evaluation and organizing school data for external evaluation. The data structure includes school data and relevant documents from school

What means this application?

- Schools reports the data and the time schedule for improving activities and internal evaluation ones
- The application just remind the user the deadline is approaching
- ARACIP has schools reports for quality-system analysis, so measures can be made based on real data
- Schools have reports for quality, so improving can be made on real data and for the next year, the unchanged data are already written

How you implement the application?

- Every school has 1-2 users assumed by the school management;
- Every user can login with a username and a password;
- Steps in implementing the application

1.In-service training with at least one user from each school

2. Informative materials

-tutorials on ARACIP Youtube chanel or on ARACIP's website;

-printed User's manual

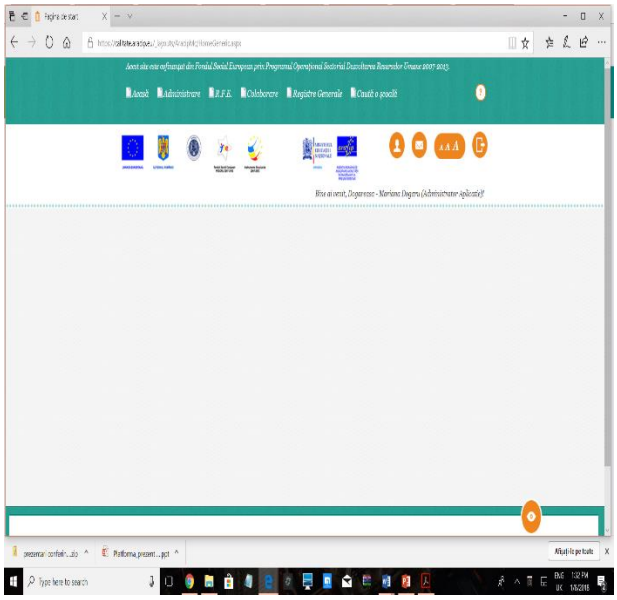
-desktop assistance

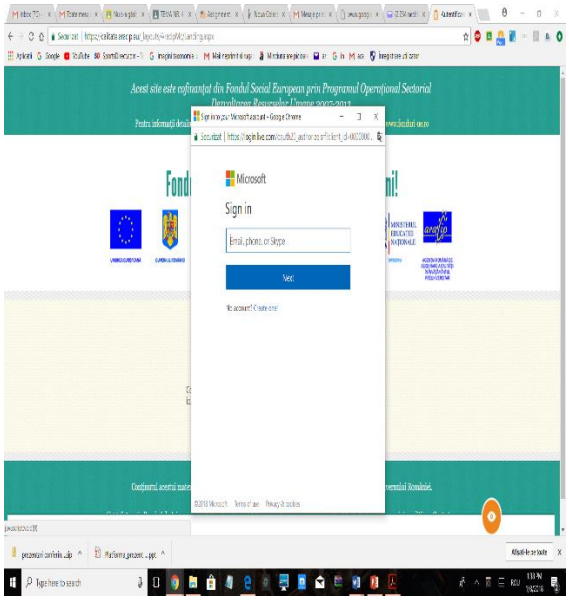
3.Piloting period for 200 schools and assistance

Sections in application

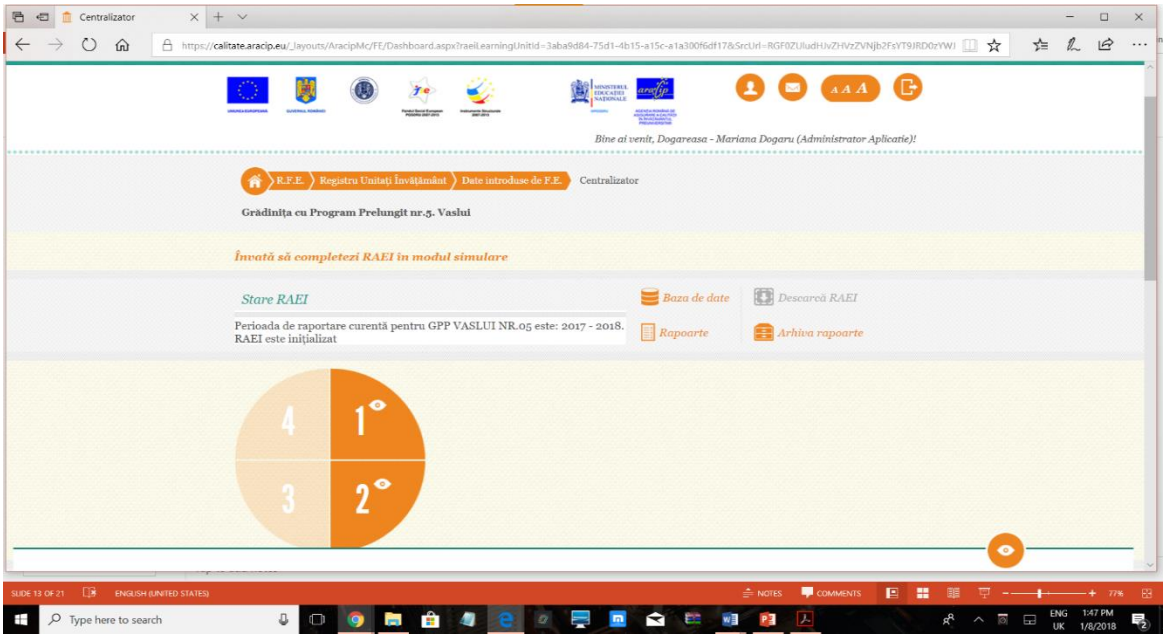
1. Internal evaluation
2. External evaluation

Internal evaluation

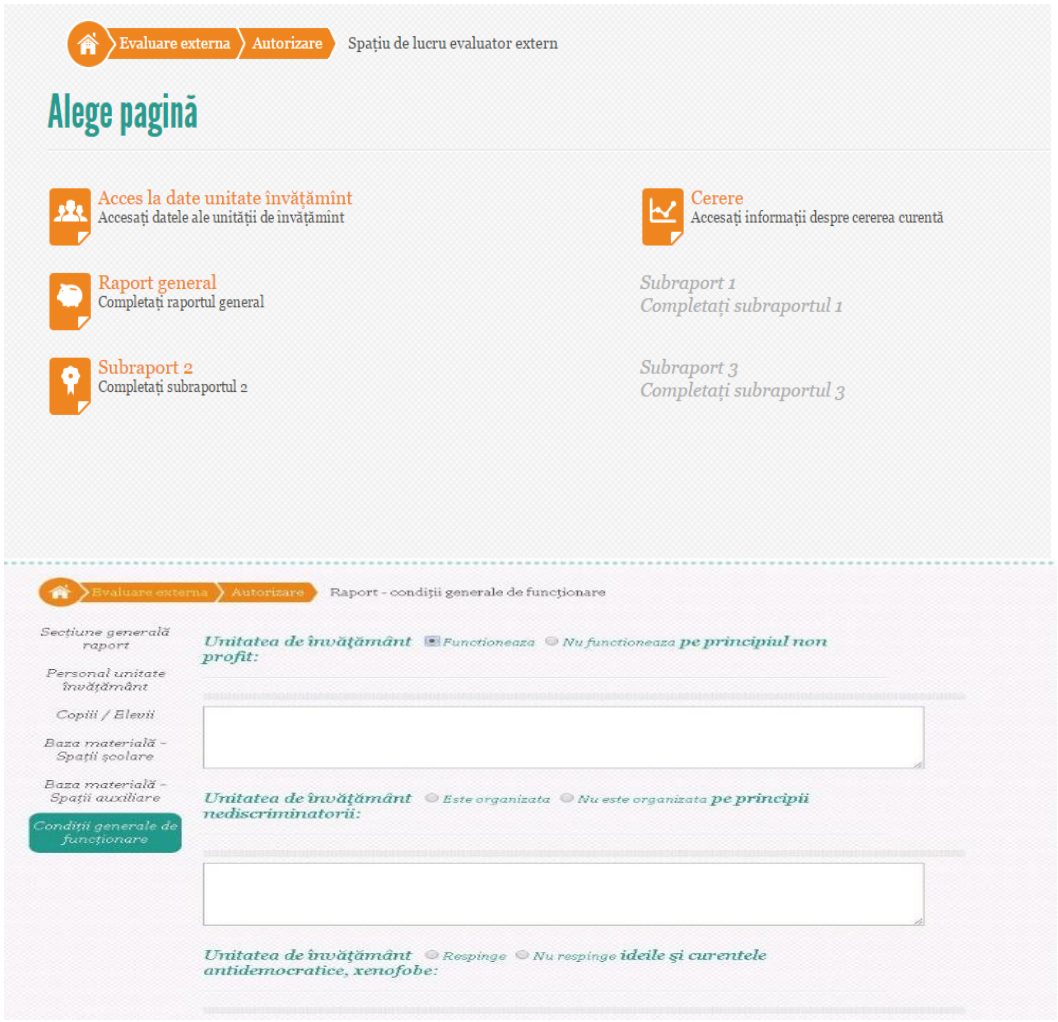




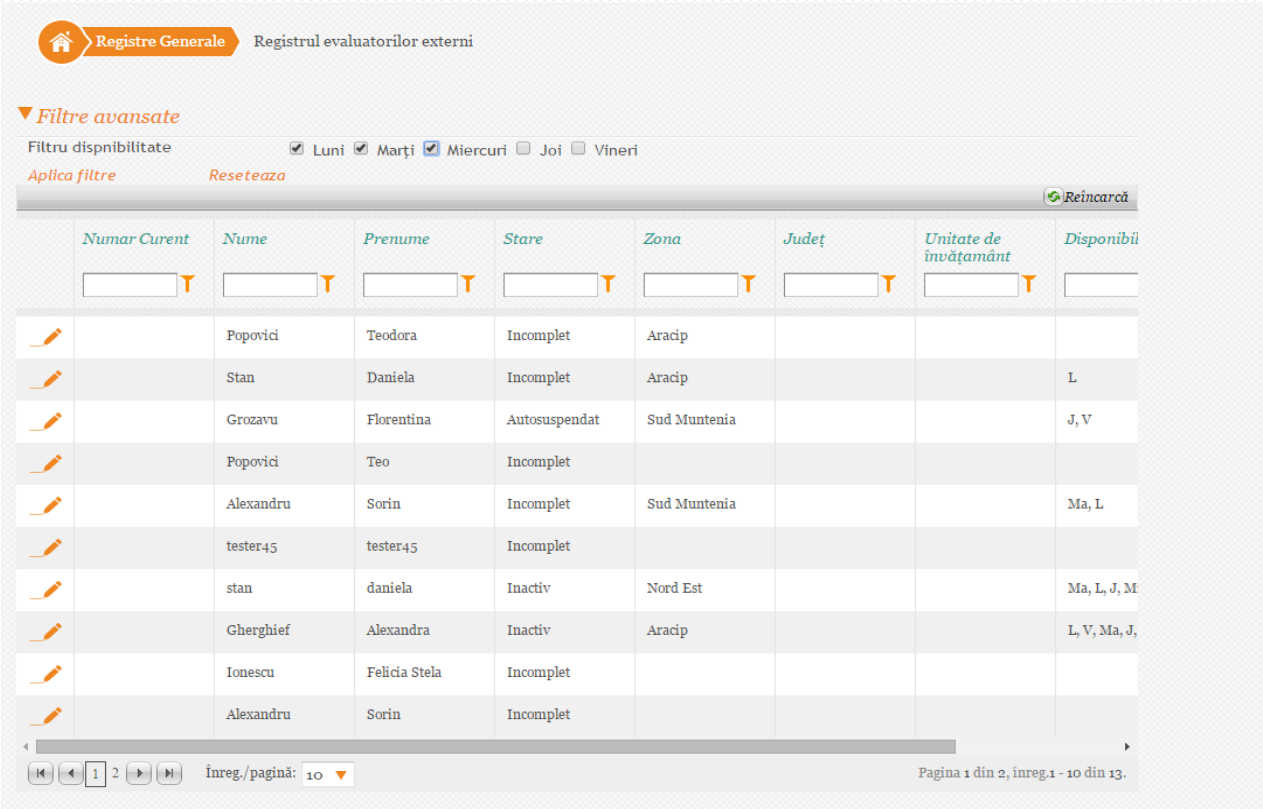
- User's profile
- School's profile
  -data base
  -PDCA circle (Plan-Do-Check-Act)
- Plan=project the activities for quality commission (internal evaluation and implementing the improvements)
- Do-the report of every activity planned
- Check-list form improvement activities
- Act-lessons learned and the future plan for activities



External evaluation section



External evaluators section



INTERNAL EVALUATION-procedure in Romania

Gathering data (parents, teachers, students, lessons assistant, documents)

Judge the level of each indicator

Make an Internal Report annually. The report is public

Propose an improvement plan

EXTERNAL EVALUATION-procedure in Romania

TOOLS for gathering data in Romania

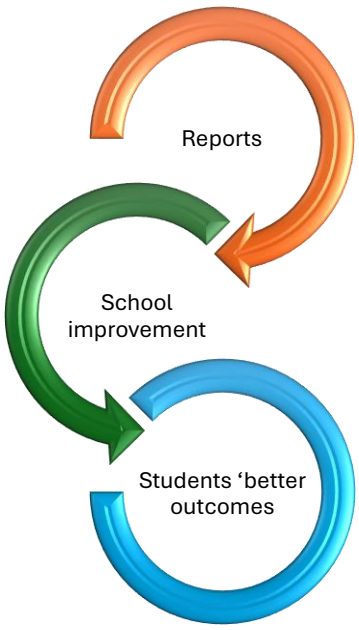
a.For internal evaluation

Observation (observation file with criteria), analizying the documents (file with criteria),lessons assistant (file with criteria), questionnaires for pupils, parents, teachers

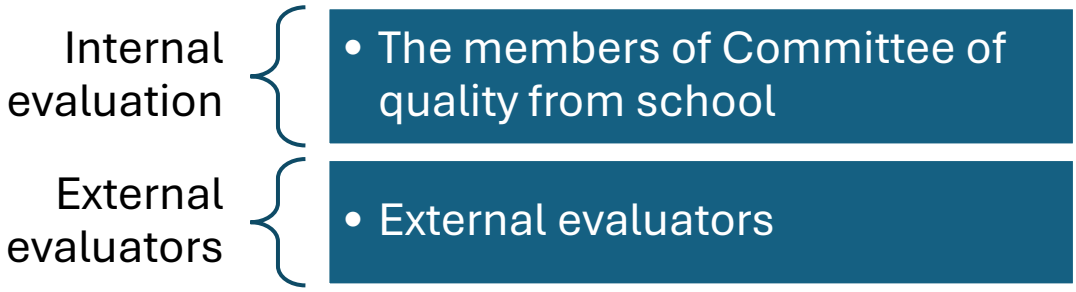
b.For external evaluation

Observation (observation file with criteria), analizying the documents (file with criteria),lessons assistant (file with criteria), questionnaires for students, parents, teachers, interview with schoo principal, local community, with entrepreneurs

The results of Internal and external evaluation



Who is in charge for each type of evaluation?



What is the Standard structure?

- *The quality area and criteria - stipulated under Government Decision no 993/2020)*
- *The sub-quality area- corresponding to the respective quality area and criteria.*
- *A (variable) number of indicators for each quality area, criteria and sub-quality area stipulated in the Law.*
- *A (variable) number of descriptors which point for each indicator:*
  - *The „rule" that must be respected or the „result" that must be obtained – for the operation standards (authorization, accreditation / periodical assessment).*
  - *The „requirements" which indicate the optimal level of accomplishment– for the quality standards (reference standards).*

What types of standards related with types of external evaluation are in Romania?

The standards are different for the stages of the school existence regarding the requirements. The domain, sub domain, criteria are the same for each type of evaluation, but the descriptors are progressive.

For **provisional authorization -** applied when a new school unit/a new level/new qualification starts its existence

- For **accreditation**, for each level of education, study program or professional qualification - applied for these who already have one series of graduates; these schools get into national system of education
- For **reference** (every 5 years)

Risk indicators in Romania that could affect students outcomes

- *The level of family education.*
- *The percent of pupils from families with economic difficulties*

- *The percentage of unorganized families (mono parental families, divorced families, children with parents gone abroad).*
- *The percent of roma students*
- *The percentage of students with special needs.*
- *In service training of teachers*
- *The percentage of new teachers at the same class*
- *The percentage of qualified teachers*
- *The space for each student*
- *Number of books from school library*
- *Percent of students that are interested to read*
- *Number of computers for each students*
- *Number of computers connected at the Internet for each pupil*
- *Number of absences motivated for each students*
- *Number of absences unmotivated for each student*

Every VET school has an efficiency index calculated taking into consideration the follows dimensions. The efficient index calculated that indicates the effort spent for students' outcomes having starting point school resources .

The dimensions of risk coefficient

1. Voulnerables groups (roma, special needs, destroyed families, low income families):

- *The most powerful influenced indicators in a negative way*

2. Quality of professionalism of teachers initial training (qualified teachers, in service trainig,mobility):

- *One of the most important indicator because it correlates positively with pupils outcomes*

3. The quality of school infrastructure (IT, educational space,school library)

- *Positively correlated with pupils' outcomes*

4. The level of family education

- *Positively correlated with pupils' outcomes*

5. "(In)discipline":

- *Absences correlated negatively with the pupils outcomes*

The Role of the External Evaluators

- ***External evaluation of schools – for authorization / accreditation/ recurrent evaluation purposes.***
- ***School (site) visit;***

- ***Reporting;***
- ***Making proposals for improving the instrument they used.***

Who might be external evaluator ?

- A teacher in VET – a good one, with proven competence.
- With experience / expertise in evaluation (personnel, projects, institutions etc.).
- With at least 40 hrs of in-service training within the last three years.
- Being able and willing to travel outside his/hers own county of residence.
- Having (as an advantage) managerial experience.

How the external evaluator are selected?

- Phase I: CV, letter of intent, personal portfolio.
- Phase II: interview.
- Phase III: evaluation during training: fulfilling specific tasks; three site visits (filling in the reporting sheets, report from the leader of the evaluation team)
- Phase IV: Written paper (essay) and interview after the completion of the training. The evaluators are officially registered.
- Phase V: evaluation after the first year of practice. The evaluators receive the credits related with their training.
- Recurrent evaluation - yearly.

EVALUATING THE EVALUATORS (continuous evaluation)

- Satisfaction questionnaires completed by the principal from school evaluated
- Satisfaction questionnaires completed by the team of evaluators from each evaluation visit
- Evaluation of school report

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Chapter 3: European Experiences in internal Quality Assurance of VET

Learning outcomes

In this chapter, you will learn about initiatives in various fields to improve the quality of VET programmes undertaken in several Member States of the EU.

You will gain insight into different strategies, approaches and methods for improving the provision of VET. By learning from these examples, you will discover practical strategies that can be adapted and implemented within your own institutional context.

- You will be empowered to improve the relationship of your institution with the labour market by designing and implementing appropriate learning processes for your students.
- You will be able to improve relationships with companies and the quality of cooperation between your institution and the labour market.

You will be able to initiate the necessary changes within your institution through change management.

*

In the last two sections of this chapter, you will learn about the challenges of the green and digital transformation for VET. You will learn new approaches to overcome these challenges and be empowered to implement appropriate approaches in your institution.

You will understand the inherent value of these experiences and will be able to use the potential of these European examples for your own country and the Armenian VET organization you're working in.

Rather than imposing rigid standards, the European framework for quality assurance works as a dynamic toolbox, from which users can select what is most relevant to their unique contexts and needs.

The European approach respects diverse methodologies applied by Member States, preserving the richness of their educational approaches, and encouraging them to exchange good practices and organise mutual learning activities with multiple potentials to drive meaningful progress across Europe.

The European framework for quality assurance is not a one-size-fits-all approach. Its versatility allows for the assessment and improvement of learning environments, regardless of their format, be it school-based, work-based, or blended learning. Whether a country or region seeks to enhance the design of vocational qualifications, bolster online learning initiatives, or refine accreditation systems, the European approach provides a structured yet adaptable reference framework for continuous quality improvement.

The crucial issue is that Member States and local provider organizations take initiatives to improve the quality of VET in those areas which they consider important based on their experience and in regard of their specific context. The following illustration provides an

overview of the very different initiatives taken by some Member States in recent years to improve the quality of their VET systems.

Source: European Commission 2024, p. 13.

3.1 Strengthening links with the labour market

Increasing the employability of graduates is the ultimate goal of every VET program. Numerous empirical data demonstrate that the employment rates of graduates of apprenticeships and dual VET programs conducted in cooperation with industry are significantly higher than those of graduates of school-based VET programs. In dual vocational education and training students in formal VET institutions spend a significant amount of time alternating between the classroom and working in labs, workshops, or an industry environment in a partner company. To combat weak employment rates of VET graduates, particularly in EU Member States with school-based VET systems, considerable efforts have been made in recent years to strengthen cooperation between VET schools and industry and to promote different types of work-based learning.

To strengthen links with the labour market in school-based VET systems and to boost work-based learning, regulatory and governance frameworks must allow and promote the necessary leeway for networking and cooperation between the education system and the industrial sector by taking into consideration and modernizing national traditions. In a few countries rigid curriculum requirements of VET courses and programs still limit the ability of VET providers to align with the labour market, but it is a general tendency in the EU to foster cooperation of VET schools with employers and adapt the design and delivery of VET programs to the needs of local and regional industry.

3.1.1 Flexibility, modularization, and individualization of learning

Flexibility and modularization, individualization, and adaptation of VET to the needs of companies and learners can be seen as a key to modernizing school-based VET by cooperating more closely with the business sector, as demonstrated by the following snapshot example.

Finland – increasing flexibility of learning

With its latest reform in 2018, the Finnish VET system may serve as a master example of flexibilization of educational pathways and curricula. The reform aimed to systematically strengthen the role of work-based learning in a school-based VET system, by making qualifications, programmes, pathways and types of learning as flexible as possible, and to align them with the needs of the learner and demand in the labour market. The system applies to both young learners and adults. VET providers are encouraged to strengthen cooperation with employers by a performance-based funding system. Delivery of VET is characterised by a flexible blend of school-, work- and online-based learning.

Flexible work-based learning components

With the reform of the VET system in 2018, the number of qualifications was decreased, and qualification content was broadened to support individualised learning pathways and to enable more rapid responses to the changing competence needs in working life. The governance framework allows VET providers to adapt qualifications according to employer-specific, regional and personal requirements. Previous learning is recognised, and students acquire only the missing skills. A personal competence development plan is drawn up for each student. Work-based learning may be provided during the whole programme duration and could cover the whole qualification, a module/unit or a smaller part of the programme. The most suitable method for a learner is agreed in the personal competence development plan. Legislation does not stipulate a maximum or minimum amount on work-based learning.

Apprenticeships and training agreements

Any qualification can be acquired through apprenticeship training or by a training agreement, and a learner may flexibly transfer from a training agreement to apprenticeship training. This

includes that training via a training agreement may be used as a pre-apprenticeship that may lower the threshold for the employer to recruit an apprentice.

Apprenticeship is a work-based form of VET with a written fixed-term employment contract between an employer and an apprentice. The student is a full-time worker and receives payment. Since the last VET reform, there is no indication in the legislation where the theoretical part should be acquired. The term “theory” is no longer used; instead, “learning in the working place” and “learning in other environments” applies. If the company is able to cover all training needs, there is no need for the learner to attend a school venue at all. (Cedefop 2019, p. 36).

In the training agreement, learners are not in an employment relationship with the company. They do not receive any payments and employers do not receive any compensation. This agreement is drawn between a VET provider and the company. No minimum or maximum amount is set for competences acquired in connection with practical work tasks. Education and training at work are integrated into personal competence plans, aligning with both workplace and individual needs.

Source: ILO 2022, p. 116f.

In Finland, such a high degree of flexibility is possible without the danger to disregard educational standards because for many years there have been coded quality standards for VET that are widely recognized and accepted by all stakeholders involved. In addition, there are solid, trust-based cooperation relationships between VET schools and employers. Nevertheless, there are indications that the extensive autonomy of VET providers and companies could lead to unequal practices. “As there is less regulation and standards, the certification process may become less comparable and transparent.” (Rintala, 2021, p. 23)

It is not a silver bullet to leave the organization of WBL to the companies and the VET schools only. Rather, it is a matter of maintaining a balance between standardization and flexibility, defining clear responsibilities for both partners and checking compliance with agreed standards. Flexibility alone is not the universal solution for strengthening work-based learning in school-based VET. There must be a framework of standards although this should be redesigned, altered, and adjusted from time to time as changing circumstances may demand.

Flexibility requires not only autonomy of local VET providers but also the necessary (financial) resources to train and prepare their staff for cooperation with companies and supervision of WBL periods. Although in Finland work-based learning together with companies has been promoted, VET schools are expected to carry the main responsibility for active collaboration. VET providers emphasized the lack of interaction between workplace and school, as well as difficulties to align work-based and school-based learning in a meaningful way (Rintala, 2021).

3.1.2 Fostering Dual Learning

The key for strengthening links with the labour market is fruitful cooperation of VET schools with local companies, partnerships between schools and (small and medium sized) enterprises. Initiating and sustaining communication on this level will ensure that training and education in work-based learning periods really fit into school-based learning. It is by

cooperation at these levels that details for coherent VET programmes are created, and that work-based and school-based components are smoothly synchronized with each other.

Dual Learning in the Flemish Region

Since 2019, the region of Flanders in Belgium operates a "Dual Learning" pathway, which is a school-based VET track including work-based learning to supply skilled workforce and match with labour market needs. Learning of competences is balanced between the workplace in a company and learning at a VET provider; it is compulsory to alternate training between the two learning venues with work-based learning compassing equivalent to 50% or more of the total scheme duration.

The training plan is based on the regionally developed curriculum (Flanders), but it can be personalized. The company is jointly responsible for the training and the achievement of the learning objectives. The VET provider remains overall responsible for the learning pathway and the qualification. School teachers are visiting the workplace on a regular basis, teachers and in-company trainers closely monitor the development of competences.

The region has established "The Flemish Partnership Dual Learning (Vlaams Partnerschap Duaal Leren)" as a structural network and center of governance. The partnership is a council with representatives of employers and employees, educational institutions, training centers for entrepreneurial training, the regional public employment agency, Department of Work, and Department of Education. The Partnership is working in close cooperation with sectoral partnerships aiming to strengthen the engagement of sectors, the quality of learning in companies, and development of synchronized curricula for dual learning. Responsibilities are as following:

- Towards policy: legislative and governance advice
- Towards stakeholders: support in quality assurance, curricula development, recognition of companies, transition from education to work
- Towards society: informing learners and companies.

(Source: Cedefop 2019; Haesarts 2021)

3.1.3 Competence-based teaching and learning (CBT)

VET schools are the crucial actors in strengthening links with the labour market. VET schools have extensive opportunities to strengthen work-based learning by modernizing their approach to teaching and learning in a dual perspective. To make this happen, VET schools must "change their mind-set" (Musset 2019), start to implement VET delivery in cooperation with industry and promote a corresponding reorganization of their education and training.

An essential step in this direction is practising competence-based teaching and learning (CBT). CBT is a structured training and assessment system that allows individuals to acquire skills and knowledge in order to perform work activities against a specified standard as expected in a real-life workplace environment. The main three pillars of CBT are

i) performance of competences (skills/knowledge/attitudes) which are derived from labour market demand

ii) criteria/standards which are defined by labour market requirements
iii) conditions which simulate or replicate real-life workplace environment.

CBT entails the mastery of each competence in the training programme before the certificate/qualification is granted. Competences and performance criteria are derived and defined by/with labour market and performance is conducted in real (or simulated work processes) workplace environment. ILO (2020) has published a manual for the development of CBT.

With CBT, VET students are introduced to the (professional) requirements that prevail at a corresponding workplace. The training method has many attributes and objectives similar to the approaches applied in dual VET systems. These include:

- Clear competence standards, which can be measured against industry-specified occupational standards, are applied
- Education and training are linked to the skills needed at the workplace
- A quality-assured skills development system is assured, which is responsive to the expectations of all stakeholders, including learners, training providers and involved companies.

In countries with a strong apprenticeship culture, the competence-based approach is a widespread standard, while systematic implementation of this approach is a challenge in other countries. Implementation of CBT requires changes in VET schools' way of management, changing instructors' timetables and schedules, and other administration issues. The main difficulties and challenges of implementing a demanding, up-to-date CBT approach quite often are the following:

- Competence-based learning turns out to be a challenge, especially when students are used to academic-style up-front teaching in classrooms.
- For the teacher it is not easy to take on the role of a practically oriented competence trainer, when having an academic background and lacking experience with industry.
- When labs and workshops are not equipped appropriately and/or when the machinery is out-dated or not working due to lacking professional maintenance.

Despite such difficulties, in many EU countries CBT is promoted to better interlink school-based and work-based learning. The experiences made suggest that CBT has promoted customer-orientation by making the studies more flexible and more individualized (Korpi et al., 2018). In addition, local companies are often willing to enable work-based learning if the VET students demonstrate relevant professional skills and appropriate work virtues. The less efforts and costs arise for companies through their participation in WBL, the more they regard their involvement as an investment with significant returns over time.

3.1.4 Preparing, guiding and monitoring work-based learning

VET schools have an important mission to keep the balance between the extended flexibility of WBL and educational quality standards and to mediate between specific employer needs and the development of transferable skills that will be beneficial to individuals throughout their working lives. To allow both, flexible and quality-oriented VET provision, VET schools must ensure synchronisation of work-based and school-based learning by relating their

students' abilities to the requirements at the workplace. Quality of work-based learning should be monitored by the school and students in WBL be supported by regular on-spot visits of schoolteachers. But teachers need time and resources for interacting with companies and sometimes find it difficult to align work-based and school-based learning professionally.

It is important, that staff in VET schools fulfil this monitoring and coordinating function professionally and perform the various tasks appropriately. VET school staff, teachers and trainers must understand the requirements at the workplace and be able to support in-company staff in organizing appropriate learning processes. Suitable training of staff of VET schools to effectively implement WBL is very important. Instead of control and instruction, a service role for the companies must be in the foreground, as foremost it is a matter of implementing work-based learning in cooperation and mutual understanding between the school and the company.

The following table contains an overview of crucial topics that should be considered when carrying out work-based learning periods in cooperation of VET schools and companies. In detail, these topics are covering the preparation of WBL periods, support and quality assurance of the implementation process, validation of students' achievements, and evaluation of WBL experiences for future cooperation of VET schools and companies.

Quality of work-based learning

Initiatives and steps to prepare, guide and monitor WBL by VET schools

	Strengthening enterprises and developing practical tools for enterprises and students
Inputs	• Screening of employers by schools before students take part in work shadowing or work experience • Selecting students carefully so that enterprises are not asked to train those who are not interested • Classes to prepare students for work placements • Skill lists that show students what they need to learn • Skill lists that show enterprises what they need to teach
Processes	• Local steering committees for programmes that bring schools and enterprises together • Regular visits to enterprises by teachers, employers' chambers or similar organisations to help them with training problems • Involving employers in selecting students for work placements
Outcomes	• Debriefing enterprises after placements to check whether there were any problems and discuss ways to address these problems • Debriefing students after their work placements to see what they have learned, and to check whether there have been any problems

Source: ETF 2017

ETF (2021) has also designed a questionnaire for VET schools to self-assess their own role in supporting or facilitating work-based learning in companies (WBL). This self-assessment can assist schools to understand their own strengths and opportunities and to plan their own improvement strategies for WBL. VET schools must prove being reliable partners to companies they work with. The best they can do is continuously improve the quality of their education and training and adapt it to new developments in the world of work. They should systematically build trust in the quality of their education, and in the attitude and skills of their students. They need to develop effective and sustainable communication channels at all organizational levels to make communication as smooth as possible. Fostering continuous communication between VET schools and companies is essential for the implementation of all WBL components.

3.1.5 Quality in cooperation of VET schools with the labour market

While cooperation with employers may be a valuable additional asset for the quality of VET provision in general, it is a "must" for VET institutions that include in their provision practical training in companies. As nowadays in many VET programmes at least some part of the training is work-based, the quality of this part becomes an inherent and decisive issue for internal quality management.

The following Action Plan outlines in a step-by-step approach how quality and continuous improvement may be incorporated into cooperation between VET providers and companies in developing their partnership.

Action Plan

to establish Quality in Partnerships of VET Schools with Companies

Step 1

Making contacts, aims to generate the willingness to cooperate and to recruit companies to provide appropriate work-based training opportunities. This is usually a long-term endeavour that calls for continuity, networking and the establishment of dependable partnerships. VET institutions' most important starting activities are:

- Invitations to employers and company representatives to events, presentations of students' work to the public, visits to companies, joint projects with companies;
- Active engagement with chambers and employers' associations, preparing the ground for mutually beneficial collaboration;
- Invitations to external stakeholders to participate in feedback surveys and interviews.

Step 2

The **planning of work-based training activities**, is mainly under the responsibility of the VET institution and must take into consideration legal requirements as well as pedagogical aims:

- Contractual arrangements setting out the rights and obligations of the trainee and the employer should be clear before the work-based training period starts;
- Adequacy of training opportunities in enterprises must be ascertained: the content of the work-based training needs to fit in with the curriculum of the VET programme, and the work-based learning environment should allow the acquisition of hard and soft skills;
- An individual learning plan should be drawn up detailing the competences to be acquired by the trainee during the work-based training period.

Step 3

includes **tutoring the students and monitoring the work-based training** through the collaboration of the VET institution with the in-company trainers, in:

- Documenting the work-based training process by means of the training protocols of the in-company tutors and the training dairies of the trainees;
- Self-evaluation by trainees and in-company tutors which helps to steer the learning process and to detect areas for improvement;
- Onsite visits of the VET institution's teachers and trainers to facilitate supervision of the trainee's performance and provide opportunities for first-hand feedback.
- On-going exchange between the VET institution's teachers and trainers and the in-company tutors to ensure a favourable work-based learning process.

Step 4

encompassing **review and evaluation of work-based training** activities, provides information for further improvement:

- Feedback from trainees and in-company trainers on the quality and results of the work-based training can be gathered through surveys and interviews;
- Evaluation of the work-based training period should include an objective assessment of the learning outcomes that the VET institution achieves;
- Additionally, evaluation should build on the observations and feedback collected during the site visits of the VET institution's teachers and trainers.

Step 5

refers to the **improvement and change of work-based training activities**, and is based on the evaluation results, the agreement on a common quality approach and the application of shared quality indicators:

- ❖ Evaluation results should be discussed among the responsible teachers and trainers in the VET institution; and also…
- ❖ Together with the in-company trainers in order to draw lessons for the future;
- ❖ Organising reflective workshops or focus groups encompassing all stakeholders may entail improvements of quality, for example the better preparation of students, reinforced coordination of work-based and school-based training, adaptation of curricula for VET programmes; leading to
- ❖ The final result of applying shared quality indicators and agreeing on a common quality approach.

Source: CEDEFOP 2015, p. 70f.

The following table presents the tools and quality goals to strengthen cooperation and to increase the involvement of external stakeholders in a VET organisation. The rows at the top of the table apply to all stakeholders, employers, local authorities and graduates, whereas the rows at the bottom refer in particular to cooperation of the VET institution with employers to jointly provide work-based training. Taking the example of implementing work-based training, the table contains not only the activities but also the quality goals to guide cooperation activities, as well as a number of tools supporting the attainment of the quality goals.

Tools and quality goals to strengthen the involvement of external stakeholders

	Type of activities	**Tools applied**	**Quality goals**
Weak ↓ Degree of involvement ↓	Socialising with external stakeholders to increase participation in common activities	PR and information activities to stake-holders	Strategy to improve cooperation with stakeholders
	Participation of stakeholders in feedback surveys or interviews	Questionnaires, interview guidelines	Response of stakeholders to quality issues
	Participation of stakeholders in workshops - selective meetings - thematic workshops - continuous cooperation	Invitation, agenda setting, inputs from VET provider, collecting feedback, focus groups	Contribution of stakeholders to quality improvement
	Cooperation in training provision		

Strong	Shared implementation of training in cooperation with external stakeholders	Formalised cooperation agreement	Strengthening work-based learning
	Shared monitoring and tutoring of work-based training	Training protocols and diaries, site visits, feedback	Assuring quality of work-based learning
	Application of shared quality indicators in common provision of VET	Agreement on indicators, common quality approach	Improvement of common VET provision

Source: CEDEFOP 2015, p. 72.

3.2 Enforcing the management of quality assurance

Within EU countries, self-assessment is the most common approach for managing internal quality assurance. Despite its widespread adoption, numerous studies and practical experiences have indicated that the potential advantages of self-assessment are often diminished due to significant shortcomings in how it is implemented. Referring to the PDCA-cycle, it was found that many VET providers have particular difficulties to move from 'Check' to 'Act' (or from 'Assessment' to 'Review and Act') in the quality cycle.

In response to these challenges, several countries have undertaken efforts to address the weaknesses identified in self-assessment practices. The initiatives to enhance internal quality assurance have concentrated on three primary areas:

- Developing effective data collection and analysis methods.
- Supporting decision-making for quality improvements by VET providers' senior management and fostering collaboration with stakeholders.
- Promoting a culture of continuous improvement among staff and other stakeholders, encouraging commitment to change, and preparing for new challenges and the resolution of existing weaknesses.

These issues are supporting VET providers to establish a fully operational internal quality management system and ensure that quality is understood as a task for the entire institution, including teachers, other staff members, students and external stakeholders. VET providers applying the whole PDCA-cycle into their operations, become better equipped to adapt to evolving educational requirements and stakeholder expectations. And the evolution in practice is intended to pave the way for empowerment of school teams, and the practical implementation of continuous improvement across all parts of the institution.

Establishing an internal quality management system ensures that the pursuit and improvement of quality are approached systematically, relying on concrete facts and measurable figures. Data collection should be intentionally designed to assess the achievement of specific quality objectives, which is central for VET institutions striving to develop effective internal quality management systems.

3.2.1 Targeted data collection

Experience in European countries has shown that VET institutions often accumulate excessive data, much of which remains unanalysed or unused due to the overwhelming volume. Uncontrolled data collection not only increases unnecessary workload but also discourages respondents from providing feedback. When stakeholders are inundated with feedback questionnaires, especially those with unclear or incoherent questions, the reliability of their responses may diminish.

It is vital to keep data collection strictly aligned with predefined quality objectives and focused on the core processes of teaching and learning. Feedback from stakeholders should be kept within manageable limits from the very beginning.

The scope of collected data must remain limited and clearly focussed to assess the (degree of) achievement of the quality objectives defined during the planning phase of the PDCA cycle.

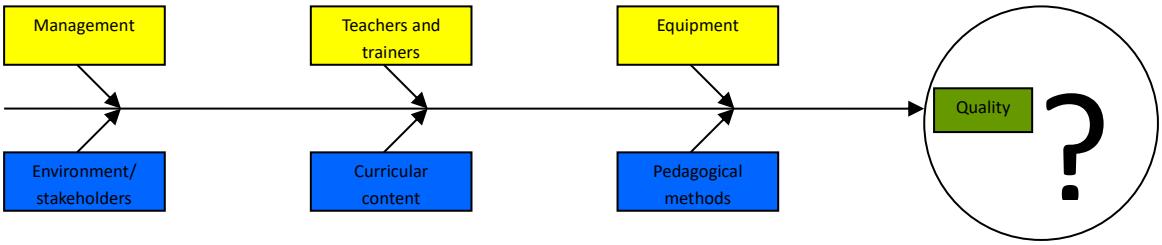
Apart from companies in which students gain workplace experience, students are the most significant stakeholders in providing feedback on issues around learning. Typically, their feedback is collected annually, and online methods should be used where possible. Questionnaires should primarily focus on the learning process and cover topics like the students' understanding of learning outcomes, the balance between theory and practice, opportunities for digital and self-directed learning, and the clarity of assessment criteria.

3.2.2 Learning by analysing factors that contribute to quality

Based on the results of the monitoring and assessment activities an analysis of performance (in relation to quality objectives and previously set targets) has to be made. This analysis reveals both successes and shortcomings, providing the VET organisation with essential lessons to support continuous quality improvement. For the analysis of both achievements and failures, it is extremely useful to be aware of the factors that could have caused the positive and the negative effects. In order to improve quality, one has to know and to change or strengthen the factors that have caused these effects.

An initial overview of basic causal factors in VET is given in the figure below, which is constructed according to the cause-and-effect model developed by and named after the Japanese quality theorist Kaouro Ishikawa. The diagram is a graphical figure of causes leading to or significantly affecting an intended result; it can be applied in many areas to analyse if and how certain factors have contributed to quality and is therefore widely used.

Basic factors contributing to quality in VET



Source: CEDEFOP 2015, p. 46.

The Ishikawa diagram is a tool for analysis and generating ideas for problem-solving and improvement. It is an illustration of cause and effect, where the intended effect is placed at the right end of an arrow, whereas main causes are noted on each side of the effect "bone" with sub-causes linked to the main factors.

3.2.3 Preparing for change

Once the causal analysis has progressed so far, the most important issues for change and improvement should be at hand. But since it is impossible to improve quality simultaneously all over the institution, one has to make choices, select and determine a focus for action. In this respect the technique of Pareto analysis, explained in the following box, may be a helpful tool.

The Pareto analysis, also known as the 80-20 rule, is a tool for prioritising improvement actions and finding solutions for problems. The rule states that 80% of problems originate from 20% of the causes. By identifying the crucial 20% you are able to improve your performance disproportionately.

As soon as the preferred areas for change and improvement are identified, the options that exist must be discussed and agreed. As the expectations and intentions of the VET organisation, of teachers and trainers, of other employees, students and other stakeholders do not necessarily coincide, quite often compromises have to be found. Moreover, it is relevant to check the means that are available through which the intended objectives should be achieved: are they sufficient to accomplish the desired results? Which partners would be available to cooperate in achieving the intended objectives? Which stakeholders could give support?

3.2.4 Developing an improvement plan

An improvement plan builds on the results of the analysis of achievements and deficits and incorporates the challenges, the opportunities and the resources available for change.

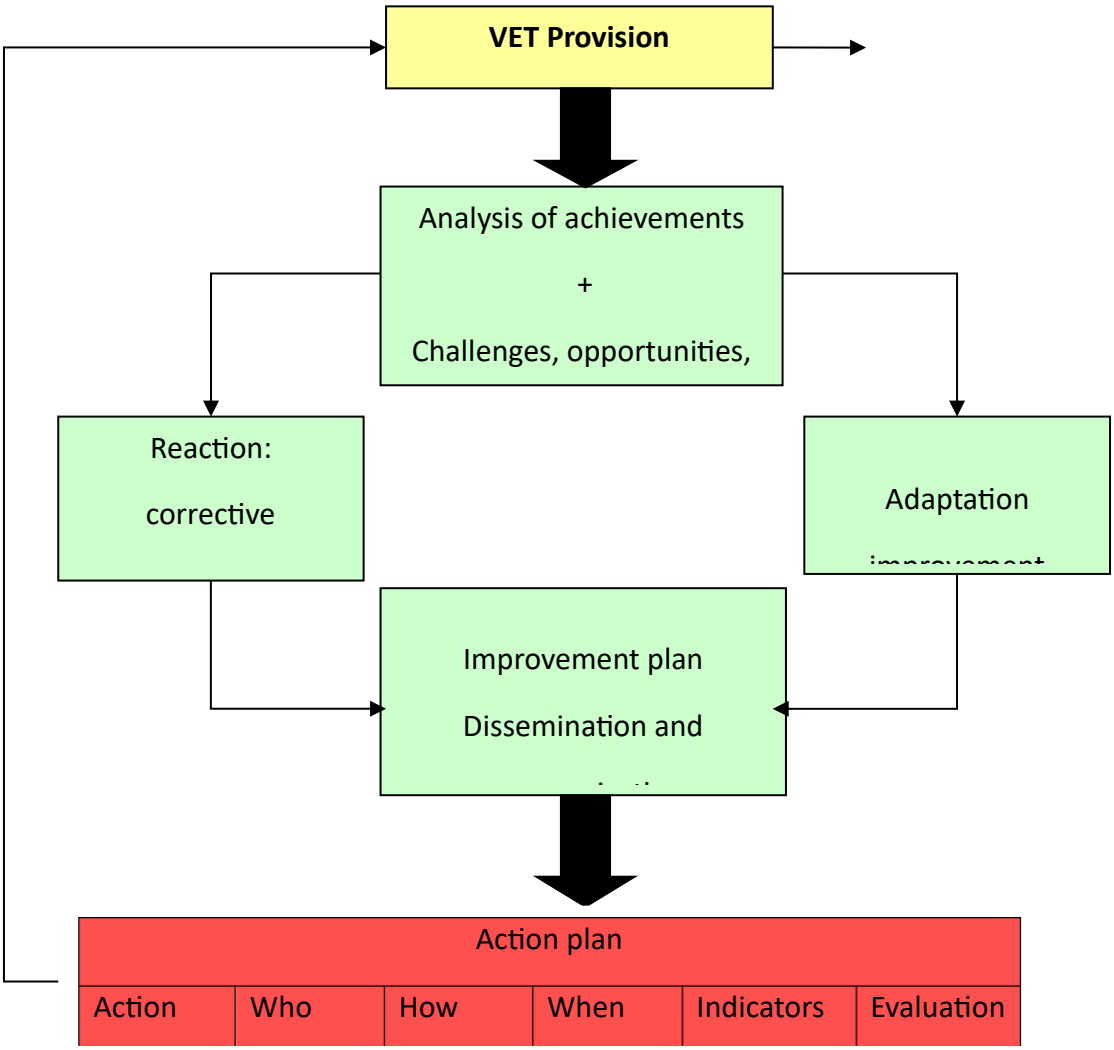
Once the main issues are identified and the most important areas for change are agreed upon with staff and stakeholders, the improvement plan compiles all this information and elaborates proposals for change of two different kinds:

- **Corrective actions** to overcome the failures and deficits detected, as an immediate response to the major complaints of students and other stakeholders.
- **Adaptive actions** to make structural improvements and adaptations of the VET institution and VET programmes offered, taking into consideration underperformance in certain areas or new demands.

An improvement plan should be reviewed twice a year and updated at least once a year as an inherent part of the annual quality cycle.

Finally, the improvement plan must be put into practice. The following figure gives an overview of how commonly identified and agreed needs for change are transformed into a detailed action plan.

Transforming improvement needs into an Action Plan



Source: Cedefop 2015, p. 49.

An action plan is meant to ensure that change really happens and that the envisaged improvement process is monitored and evaluated in order to check if the intended effects have been achieved. In detail, an action plan should record the:

- kind of actions to be undertaken,
- individuals responsible for implementation,
- resources and tools needed to undertake the planned actions,
- deadline by which the actions should be completed,
- indicators to measure if the intended effects are really achieved,
- assessment and evaluation of the envisaged progress.

The Austrian Quality Management System for Schools (QMS)

The newly established Quality Management System in Austria aims at developing and implementing a common quality framework for all types of schools to better monitor the education system. The QMS has been implemented since 2021 across 5,927 Austrian schools, of which 696 are VET schools.

The Quality Management System for Schools (QMS) main objectives are:

- To systematically design and organise quality development and quality assurance at school level by providing schools with a common quality framework and the supporting tools for schools to implement agile quality management at all levels and to develop schools' projects (including both central reform and school-specific projects). To this end, the QMS centralised all the necessary tools on the dedicated platform qms.at (e.g., the school development plan, the QMS Manual, tools for internal school evaluation and feedback).

- To provide schools autonomy and flexibility to set their own goals and review them periodically with the respective school quality manager to pursue their own development plan.

- To generate evidence-based school management and decision making at all school levels (teams of teachers and individual teachers).

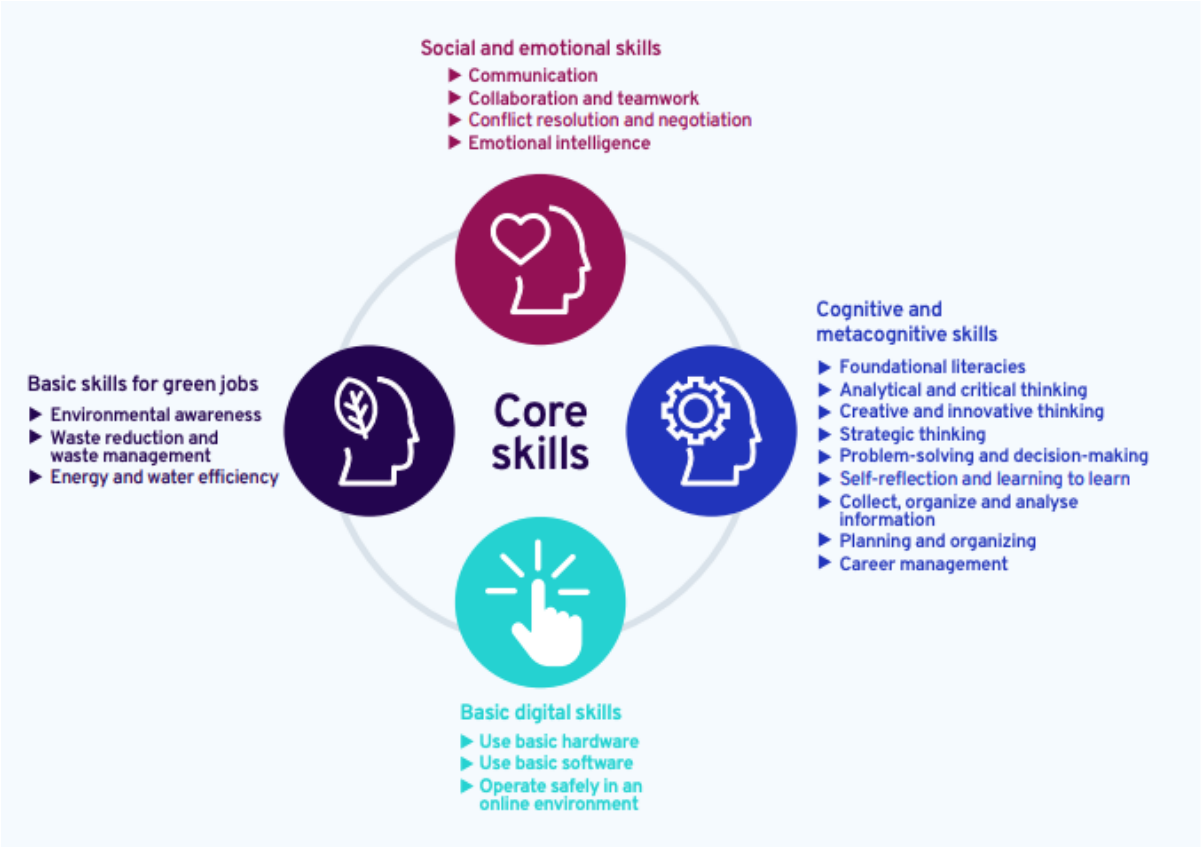
- To encourage the development of 'mission statements' at organisation and individual level, which may encourage the cultivation of a quality culture in schools.

Source: European Commission 2023.

3.3 Changing skills demand in the labour market

While the importance of transversal competences has long been acknowledged, only in recent years have they gained substantial attention within VET frameworks. Marking a pivotal development, the ILO unveiled a framework in 2021 that brings together core social, emotional, and cognitive skills, integrating them with the abilities required for thriving amidst digital and green transition. This framework, depicted in the accompanying figure, highlights that digital and transversal skills are deeply interconnected - sometimes one forms the foundation for the other, and in some cases, they mutually reinforce each other.

Framework for Skills and Life in the 21st Century



Source: ILO 2021, p. 26.

It is important to recognise that these different types of skills are not mutually exclusive: digital and green skills tend to overlap with transversal skills, sometimes having them as a precondition, and sometimes conditioning them. The position of digital skills as one component of a wider set of 'core skills' has important consequences for how they can be reflected within VET.

The shifts in labour market needs and skills described above are generating a number of new or enhanced demands on the VET system, in particular with regard to the digital and green transitions. The following two chapters will further elaborate these two key issues.

3.4 Managing the digital transition

VET has great potential to respond to the mentioned changes and to contribute to the increases in productivity that digitalisation can bring about in the economy, not just in technology sectors but across all sectors where technology is a central driver. Navigating the evolving influence of digital technologies in the labour market, the rising influence of artificial intelligence (AI) has propelled digitalisation beyond manual and routine tasks to encompass cognitive ones as well. This shift underscores the growing significance of digital competences, which now stand alongside transversal skills as pillars of workplace readiness.

3.4.1 Improving the speed of responses to changing skills demand

Whilst the need for greater labour-market responsiveness - and hence agility - has long been on the agenda, the pace of technological advancement demands even greater agility and flexibility. Digital technologies change rapidly, creating challenges in keeping standards and curricula up to date and requiring systems to refresh more quickly and to be agile in adapting to hybridisation as the lines between occupations blur and new occupations emerge.

To maintain the quality of VET provision and its relevance for the labour market, it is necessary to ensure that digital competence standards are embedded in the curricula of VET programs by reviewing occupational standards and learning outcomes more frequently, and to see how adaptation of VET programs might be speeded up in order to keep pace with changes in technology.

VET systems' extensive engagement with the business sector enables them, in contrast to other educational models, to adapt efficiently to evolving labour market demands regarding workforce qualifications. Indeed, partnerships between VET schools and companies can play an important role in meeting digital skills needs by adapting VET programs and curricula. And collaboration in providing work-based learning will make it even clearer that the speed of change in the digital world requires significant systemic changes in the design and delivery of VET programs.

By opening up qualification systems, modernizing curricula, and providing modular learning, VET students should be enabled to acquire digital skills in high quality programmes linked to recognised credentials. Amidst these evolving demands, innovative approaches to learning and qualification are emerging as key tools for ensuring the relevance and agility of VET systems. Traditional models of lengthy, linear education pathways are increasingly complemented by more modular, targeted learning opportunities. These approaches allow students to quickly acquire and demonstrate specific competences aligned with urgent labour market needs but also support lifelong learning by enabling upskilling and reskilling at any career stage. This adaptability is particularly vital in sectors experiencing rapid technological change, where the ability to certify new or updated skills efficiently can be a significant advantage for both workers and employers.

3.4.2 The potential of micro-credentials

Short courses, micro-credentials and their digital form - digital badges - seem to play an increasingly important role in flexible skills developing, and more generally in modernizing the design of VET programs.

They can be used both to recognise skills acquired before or during a programme through external courses or other informal learning experiences, and to recognise skills acquired as part of a formal VET programme (at school or at the workplace).

An important issue for national authorities is whether and how digital badges might be incorporated into state-regulated qualifications which provide a guarantee of quality. More generally, VET providers could include professional digital badges as 'add-ons' so that they are not part of the mainstream programme but enable wider skills to be acknowledged. Such digital badges have the potential to fit within a wider range of VET programs.

Using short courses and digital badges for greener construction in Ireland

To meet new Building Regulations for Near Zero Energy Buildings, Ireland has developed training modules and learning units to equip the workforce with necessary skills. Limerick Institute of Technology, along with partners Waterford Wexford Educational Training Board WWETB, have developed the portfolio of current craftworkers (plasterer, carpenter, electrician, ventilation, plumber, bricklayer and site supervisor).

The courses are approved by the Construction Industry Federation and 'assured' by the international awards organisation, City & Guilds, which provides digital badges under its programme recognition service, which benchmarks programmes against their quality standards.

The courses were developed with inputs from industry partners, government departments, local authorities and third level (post-secondary) institutions. Course duration ranges from one to four days and delivery is a mix of online provision and one-day practical workshops.

Source: ILO 2023, p. 60

Micro credentials, digital badges and the associated learning programmes offer the potential for 'ready-made' solutions to keep qualifications and programmes up to date. Whilst having many potential advantages, micro-credentials and digital badges also present some challenges, which are stemming from their unregulated nature and recent proliferation, leading to a lack of clarity for both learners and (potential) employers as to their quality and value in the labour market.

3.4.3 Provision of higher level technical and professional skills in VET

Development of higher-level VET programs could play a key role in digitalisation by opening up alternative pathways to high-skilled jobs. The development of the digital economies entails increased demand for high level skills. To meet the demand for higher level skills, there is an opportunity to develop higher VET programs that provide alternative pathways to general/academic educational routes for those individuals who flourish through practical learning. VET programs could be used to develop alternative high-quality routes into digital professions, as for example AI learning. An adequate approach for development is through

partnerships with employers in the definition of occupational standards to ensure consistency across levels and coherence between workplace and school components.

3.4.4 Training for Teachers and in-company Trainers

A critical aspect of the digital transition relates to ensuring that teachers and in-company trainers are equipped with the skills they need to meet the needs of their students in the digital and knowledge economies. Teacher and in-company trainers need to have opportunities through continuing professional development to acquire digital skills, not just at basic level but in order to teach their students in the latest technologies.

European examples: Equipping teachers and trainers for the digital transition

In Estonia, several steps have been taken over several years to support teachers' digital skills development. For example, the Digital Focus Programme developed the digital skills of all teachers, including VET teachers, who also received support for using and updating digital resources.

There has also been a focus on developing digital assessment tools. These tools have been developed to assess the professional components of VET, in which representatives of selected professions have proposed parts of professional exams to be assessed digitally. Teachers have also received training in the use of digital assessment tools.

*

In North Macedonia, the pilot project 'Digitalschool.mk' helped vocational teachers to use digital instructional tools in their teaching. 'Lead teachers' were trained to use Moodle tools and in turn they trained and mentored more teachers in their schools, rolling out the programme across the country.

Teachers were in charge of all aspects including designing websites, materials, training and support processes. In the classroom, teachers were able to use tools most suited to their particular subjects, with quizzes, programmed learning and video being most popular.

Source: Cedefop 2022

There is an important role to be played by specialized teachers being trained as professionals in relation to digital learning, as the following example of the digital facilitator demonstrates. Digital Facilitators or Animators are teaching professionals with teaching skills related to the integration of digital technologies and with a strong media education competence. They implement digitalisation projects for VET programmes and support colleagues in the use of new technologies.

Digital Facilitators or Animators to support Digitalisation of VET Schools

The Swiss Federal University for Vocational Education and Training (SFUVET) has developed the skills profile of the so-called Digital Facilitator, a teaching professional deputed to promote digital transformation of Swiss VET Schools. The Digital Facilitator is a teacher with advanced digital competence and a strong media education competence who is an expert in facilitating digital innovation within educational institutions and pay particular attention to the interplay among and across learning sites.

A similar profession has been created in in Italy, the Digital Animator. The *Digital School National Plan* which came into force in 2015 requires every school to have a teacher nominated as a 'Digital Animator', with a strategic role to promote digital skills.

Source: ILO 2023, p. 196

3.5 Managing the green transition

Worldwide, the green transition is driven by challenges such as climate change and protection of the environment and the related economies. In the EU, the green transition has been significantly accelerated in recent years by a political agenda, the so-called "Green Deal". However, following serious concerns that the swift pace of the policy-driven transition could impact the competitiveness of European industry, certain aspects of the Green Deal have been moderated meanwhile and given a lower priority on the political agenda. Nevertheless, as global challenges persist, the green transition will continue and most likely reinforce the developments for the VET system described in the following sections.

3.5.1 Evolving demand for green skills in the labour market

So far, experience has demonstrated already that the green transition will alter many existing occupations and generate new ones, particularly those requiring higher skill levels, at the same time. The renewable energy sector and the environmental goods and services sectors - including waste, energy, and water management - have contributed to the growth of green jobs in various countries. The employment impact of the green transition differs across sectors; for instance, in certain segments of manufacturing, such as the automotive industry transitioning to electric vehicles, job substitution is occurring, while other segments, which focus on producing green products like wind turbines, generate significant numbers of new jobs.

Skill effects vary by level of skill:

- In low-skilled jobs, greening tends to need generic skills, for example, in environmental awareness and simple adaptations to work tasks like waste collection.
- In medium-skilled jobs important technical skills changes are needed in existing occupations like construction (for example, energy efficiency skills), along with some new green occupations like wind-turbine operators.
- Most new green occupations involve high-skill levels, for example, climate-change scientists, agricultural meteorologists, and there are significant demands for new skills in existing jobs like engineering.

Although technical skill effects differ by level, all occupations will require some degree of skill change. Core transversal skills for green jobs are necessary across the workforce and closely align with those needed for digitalisation (see section 3.3.1) presenting opportunities for policy synergies (ILO, 2022).

Transversal core skills needed for the green transition

- ✓ Environmental awareness and protection; willingness and capability to learn about sustainable development
- ✓ Adaptability and transferability skills to enable workers to learn and apply the new technologies and processes required to green their jobs
- ✓ Teamwork skills reflecting the need for organizations to work collectively on tackling their environmental footprint
- ✓ Resilience to see through the changes required
- ✓ Communication and negotiation skills to promote required change to colleagues and customers
- ✓ Entrepreneurial skills to seize the opportunities of low-carbon technologies and environmental mitigation and adaptation
- ✓ Occupational safety and health (OSH)

Source: ILO 2019, p. 30

3.5.2 Towards greener VET programs: renewal of qualifications, curricula and teaching

It is difficult to judge how far a general greening of curricula has taken place. Although numerous EU countries have engaged in developing VET programs for emerging green occupations, such as those within the renewable energy sector, efforts to update existing curricula have been considerably less consistent.

Developing these skills is not just a matter of (re-) designing curricula by VET providers; it also requires the definition / re-definition of occupational standards and related nationally recognized qualifications in line with new developments in industry. To accurately reflect the effects of the green transition on work tasks and responsibilities, occupational and competence standards, as well as learning outcomes, should be updated across all VET programs - not just those in the green economy.

Collaboration between governments, educational institutions, and industry stakeholders is vital to align VET providers with real-world green job requirements. In greener VET programs students must be equipped with competences to respond to evolving environmental standards and technological advancements, ensuring that they can both contribute to and benefit from the green transition. Embedding green skills into every stage of the program - from curriculum

design to assessment - will help prepare graduates for new demands in the labour market, and support businesses in meeting their sustainability goals.

It is important to highlight that greening involves both redesigning and upgrading the occupational (or competence) standards and learning outcomes that underpin VET programs and, where necessary, investing in new courses and teaching equipment in order that VET providers can design and adjust curricula. There is also potential for micro-credentials and digital badges to play a role similar as described in the section on digital transition (see section 3.4.2).

3.5.3 Teaching and learning in schools and at workplaces

While qualifications and curricula address what students learn, it is also crucial to consider how they learn. Fostering greener mindsets requires innovative approaches that encourage critical thinking, collaborative problem-solving, and practical application of „reuse, repurpose, and recycle“ principles.

An integrated approach is necessary, combining curriculum innovation with investments in capacity building of teachers and trainers. Updating VET programs to reflect evolving green skills requirements means not only embedding environmental content but also ensuring that educators are equipped and confident to deliver these changes effectively.

VET is well positioned to embrace new methodologies since programs provide a range of environments and learning modalities: they mix experimental and hands-on learning and provide learners not just with classroom-based theory but also with opportunities to learn from practical experiences of greening either in workplaces or in school-based simulations.

By nurturing collaboration among learners, teachers, and industry mentors, VET programs can create a dynamic learning environment where theoretical understanding meets practical application. This synergy prepares VET graduates to be agile contributors to a rapidly shifting labour market, capable of addressing the nuanced demands of sustainability in diverse sectors.

Case-based and project-based learning are examples of methods that support greening by bridging classroom and workplace experiences and offering interdisciplinary approaches and practical problem-solving relevant to environmental issues.

Just as important as the development and use of new methods is the development of the learning environment. Indeed, one cannot proceed effectively without the other. This can be as simple as greening classrooms and workplaces by putting up posters to promote green awareness and actions. But a more thorough approach is to look at the entire environment, the campus of VET schools, to see how it can be greened. ‘Campus greening’ means examining how to apply green principles to activities such as waste management and the procurement of goods and services. VET schools can develop sustainability plans to put this into effect and use tools to measure their carbon footprint.

The work-based learning element of VET can also support the greening process. It can enable the green ‘theory’ learnt in VET schools to be put into practice, offer opportunities to tap into the latest green developments, when employers are using the latest green technologies, which VET schools might not be able to provide.

Using work-based learning to meet the need for green jobs in construction

Estonia is setting up a new internship system for VET specifications in construction with a project focusing on energy-efficient construction and smart house solutions. These areas suffer from skills shortages, as identified by the national skills forecasting system, as well as a lack of TVET provision.

As a result, learners struggle to find internships in companies to learn the special skills they need. Through the project, construction teachers and partners of the schools involved are improving the way the internships are organized and construction practitioners will be involved more deeply in teaching: ten top specialists from companies belonging to the Estonian Association of Construction Entrepreneurs will give lectures or supervise in-school practical training for at least four hours.

The project partners are three TVET schools, the Estonian Employers' Confederation and the Estonian Association of Construction Entrepreneurs. The involvement of the two national employers' organizations is seen as an important benefit.

Source: ILO 2022, p. 62

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Chapter 4: External and Internal Quality Assurance-Trends and Challenges in the EU

4.1.External Quality Assurance-Trends and Challenges in the EU

We can divide the challenges in external evaluation into two main categories: trends related to the learning process and those related to how external evaluation can capture these aspects.

The contemporary educational landscape demands a holistic approach to curriculum design, student engagement, and institutional leadership to address diverse learner needs and promote equity. We synthesize key principles from educational research, emphasizing learning outcomes, motivation, feedback, autonomy, and inclusive practices, with a focus on overcoming socio-economic barriers. Drawing on established theories and empirical studies, it outlines strategies to optimize educational quality through integrated, evidence-based practices.

4.1.1. Learning outcomes as the foundation of curriculum design

Learning outcomes, encompassing knowledge, skills, and competencies, serve as the cornerstone of curriculum design and assessment.

Effective curricula align assessments with clearly defined objectives, ensuring that evaluations measure both academic progress and practical competencies. Challenges include aligning assessments with transversal skills, such as critical thinking and collaboration, which are essential for holistic development. An integrated approach, incorporating formative and summative assessments, ensures that educational practices foster comprehensive student growth.

Examples from Romania (requirements from national standards)

B.53. *Ensuring compliance with current legislation regarding the balance between planned learning activities, including homework, online learning activities, and extracurricular activities, and recreational activities.*

B.54. *Ensuring the relevance of designed learning activities for the development of key competencies – with an emphasis on literacy and numeracy skills – or professional competencies, as applicable.*

B.*62.* *Organizing and implementing learning activities aimed at developing key competencies – with an emphasis on literacy and numeracy skills – or professional competencies, as applicable.*

B.65. Implementing individualized support, remedial, or improvement activities in learning that lead to achieving the expected and designed learning outcomes of educational activities

Motivation is pivotal in sustaining student engagement, influenced by internal factors (e.g., autonomy, personal interest) and external factors (e.g., teaching methods, resources, family support) (Deci & Ryan, 1985; Jain & Prasad, 2018). Digital tools and constructive feedback

enhance motivation by providing personalized learning experiences and recognizing progress (Hopkins, 2015). Policies that support infrastructure development and teacher training further amplify student commitment, particularly in under-resourced settings.

Examples from Romania (requirements from national standards)

C.55t. *Collaborative design of workplace learning activities by the practice tutor and the teacher responsible for monitoring the implementation of the practical training stage.*

B.46t. *The existence of measures ensuring that the qualifications of personnel responsible for workplace learning (the practice coordinator from the educational institution and the tutor from the enterprise) are aligned with the professional qualifications being taught.*

4.1.3. Feedback and digitalization for continuous improvement

Feedback, both formative and diagnostic, is critical for optimizing educational outcomes. Evaluations conducted by agencies like ARACIP, combined with digital platforms, enable data-driven decision-making and collaborative dialogue (Garira, 2024; Kulal et al., 2024). These tools identify areas for improvement and support inclusive practices. Teacher training and digitalization ensure feedback is actionable, fostering a reflective culture that adapts to diverse learner needs (Hopkins, 2015).

Examples from Romania (requirements from national standards)

B.4.t. *Correlating the outcomes obtained following the implementation of the School Action Plan (PAS) with the product or outcome indicators from the current Institutional Evaluation Plan (PLAI) and School Performance Assessment Report (PRAI).*

B.105*. Demonstrating access and progress, since the last external evaluation, regarding the access of children/students and teachers to school and auxiliary spaces, teaching materials, curricular auxiliaries, the library/documentation and information center, and information and communication technology.*

4.1.4. Embracing errors as learning opportunities

Errors, when managed constructively, become opportunities for growth. A supportive environment that encourages risk-taking and provides formative feedback fosters a growth mindset (Dweck, 2006; Dahlberg et al., 2007). This approach empowers students to view challenges as integral to learning, enhancing resilience and critical thinking.

Examples from Romania (requirements from national standards)

B.57. *Defining the expected outcomes of learning activities in terms of competencies (knowledge, skills, attitudes, and expected behaviors).*

B.19. *Annual and accurate collection, at the community and educational institution level, of data regarding risk factors that may affect school participation, the well-being of toddlers, preschoolers/students, and the achievement of expected outcomes.*

4.1.5. Addressing socio-economic barriers

Poverty and social inequality significantly hinder educational access and outcomes. Structured learning environments and trusting teacher-student relationships mitigate these effects, promoting equity (Suharti et al., 2021). Afterschool programs and mentorship initiatives create a sense of belonging, reducing dropout rates and supporting vulnerable students (Peterson, 2013).

Examples from Romania (requirements from national standards)

B.46t. *The existence of measures ensuring that the qualifications of personnel responsible for workplace learning (the practice coordinator from the educational institution and the tutor from the enterprise) are aligned with the professional qualifications being taught.*

B.51. *Annually promoting and communicating within the educational institution and the community the progress and outstanding achievements […] students, and staff, as well as interventions aimed at improving school participation and learning outcomes—particularly for disadvantaged/vulnerable groups or individuals. Where applicable, this should be done in accessible formats and with technologies suitable for specific disabilities, while ensuring the confidentiality of personal data and avoiding labeling.*

B.52. *The inclusion in the educational offer of activities that reflect the language, culture, and traditions of national minorities present in the educational institution, where applicable, or activities specific to intercultural education.*

4.1.6. Teacher leadership, student autonomy and fostering self-awareness

Teachers play a pivotal role in fostering student autonomy through democratic leadership and small, achievable goals (Muhammad, 2022). Strategies such as project-based learning (PBL) and individualized learning spaces empower students to manage their learning and make informed decisions (Allison et al., 2015; Sigurðardóttir & Hjartarson, 2015). These approaches are particularly effective in disadvantaged communities, where autonomy builds confidence to overcome socio-economic barriers.

Self-awareness, encompassing recognition of strengths, weaknesses, and motivations, is critical for student development. Mental health programs, parent-school collaborations, and Universal Design for Learning (UDL) principles support students in setting goals and managing stress (Reicher & Matischek-Jauk, 2018; Williams et al., 2018; Chambers & Coffey, 2018). These interventions are vital in underserved communities, where students face heightened emotional and social challenges.

Examples from Romania (requirements from national standards)

C.88*. Facilitating the implementation of evaluation activities (including for extracurricular activities) to develop autonomy and the capacity for self-regulation in toddlers, preschoolers, and students.*

C.89. *Statistical processing of evaluation results and the use of processed data to establish subsequent learning tasks.*

4.1.7. Evidence-based strategies for autonomy and reflection

Hattie's (2014) research underscores the importance of understanding students' current knowledge levels, deliberate practice, and constructive feedback. Normalizing errors and personalizing learning enhance autonomy and self-awareness, particularly for students in low-income settings who benefit from accessible challenges and reflective practices (Hattie & Timperley, 2007).

Examples from Romania (requirements from national standards)

B.8.t. *Conducting practical training stages at the economic operator in accordance with the planned schedule and achieving the outcomes established by legal regulations.*

C.88. *Facilitating the implementation of evaluation activities (including for extracurricular activities) to develop autonomy and the capacity for self-regulation in toddlers, preschoolers, and students.*

4.1.8. Collaborative partnerships

Bidirectional school-family collaborations and afterschool programs foster autonomy and belonging (Buchanan & Buchanan, 2016; Peterson, 2013). These partnerships provide opportunities for personalized development, strengthening community ties and supporting student success. n Romania, these partnerships are regulated by the National Education Law (Law No. 198/2023, as amended) and are mandatory for dual or vocational education programs, where students spend a significant portion of their time in practical training stages at economic operators.

Role and importance of partnerships

- **Development of practical competencies**: partnerships enable students to apply theoretical knowledge in real-world work environments, such as factories, workshops, or offices. According to ARACIP (Romanian Agency for Quality Assurance in Pre-University Education) standards, educational institutions must sign contracts with employers for practical training, ensuring alignment with occupational requirements (see indicators B.35t and B.46t in ARACIP evaluation standards).
- **Alignment with labour market needs**: collaboration with economic operators facilitates curriculum updates, incorporating modern technologies (e.g., digitalization, automation). Programs supported by the Ministry of Education or European funds (e.g., Erasmus+, PNRR) promote inclusivity and reduce dropout rates.
- **Benefits for all parties**: Schools gain access to resources (equipment, mentors), companies secure qualified labor, and students benefit from employment opportunities post-graduation. For instance, dual education networks in counties like Timiș or Cluj, involving partnerships with multinational companies (e.g., Bosch, Continental), have achieved employment rates exceeding 80% for graduates.

Examples from Romania (requirements from national standards)

***C.39**. The existence of partnership agreements with public institutions, economic operators, or NGOs, or the procurement of complementary educational services to expand and improve the use of new digital technologies in the educational process.*

***C.2.** Including projects, partnerships, programs, and/or measures in the PDI/PAS regarding collaboration between the educational institution, parents, and the local community to achieve the established strategic objectives.*

***B.35t.** Establishing, through contractual clauses, the alignment of workplace training facilities at the economic operator with the requirements of professional training standards for each qualification taught in vocational/dual education.*

***B.46t.** The existence of measures ensuring that the qualifications of personnel responsible for workplace learning (the practice coordinator from the educational institution and the tutor from the enterprise) are aligned with the professional qualifications being taught.*

4.1.9. Leadership for inclusive environments

Effective leadership, characterized by collaboration and self-evaluation, creates environments that promote independence (Ramberg et al., 2018; Podgornik & Vogrinc, 2017). Culturally responsive practices and coaching enable teachers to address diverse needs, particularly in disadvantaged communities (Heineke et al., 2017; Barkley, 2010).

Examples from Romania (requirements from national standards)

C.1. *Facilitating the participation of legally designated education beneficiaries, as well as other specific representatives of the community, in the development of the Institutional Development Plan (PDI) / School Action Plan (PAS).*

C.2. *Including projects, partnerships, programs, and/or measures in the PDI/PAS regarding collaboration between the educational institution, parents, and the local community to achieve the established strategic objectives.*

C.3*. Including targets, programs, and/or activities in the PDI/PAS that are established at the request of education beneficiaries from the community, including, where applicable, those related to existing minorities or elements of intercultural education.*

C.4. *Incorporating the European and international dimension into the PDI/PAS through activities, programs, partnerships, and projects specific to intercultural education and diversity.*

C.5. *Including at least one target/program/activity in the PDI/PAS related to inclusive education, aimed at attracting and integrating all categories/groups of vulnerable toddlers, preschoolers/students into the school community.*

C.6. *The existence, in the PDI/PAS and the managerial plan, of specific strategic targets and activities dedicated to improving learning outcomes and the well-being of toddlers, preschoolers/students from disadvantaged/vulnerable groups, as well as those who are talented and/or capable of high performance.*

C.7. *The existence of specific strategic targets/programs/activities related to intercultural education and diversity.*

4.1.10. Technology and innovation in education

Digitalization facilitates data collection, personalized learning, and continuous feedback, but requires robust data protection policies (Zhu et al., 2017; Dronkers, 2010). Artificial intelligence (AI) enhances data analysis and administrative efficiency, yet ethical guidelines are essential to ensure equitable implementation (Nikolaeva et al., 2023; Wang et al., 2024).

C.39. *The existence of partnership agreements with public institutions, economic operators, or NGOs, or the procurement of complementary educational services to expand and improve the use of new digital technologies in the educational process.*

C.57. *The use of information and communication technologies in the design of learning activities*

Equity in education requires tailored interventions that address the needs of vulnerable groups, including those from low-income backgrounds, minorities, and students with disabilities (Kyriakides et al., 2019). Culturally responsive practices, mental health support, and

flexible curricula reduce disparities and promote inclusivity (McKinney & Flenner, 2006; Chen et al., 2023). Monitoring and evaluation tools ensure interventions are effective, fostering a reflective organizational culture (ARACIP, 2023; Demissie & Pearse, 2025).

Examples from Romania (requirements from national standards)

B.51. *Annually promoting and communicating within the educational institution and the community the progress and outstanding achievements […] students, and staff, as well as interventions aimed at improving school participation and learning outcomes—particularly for disadvantaged/vulnerable groups or individuals. Where applicable, this should be done in accessible formats and with technologies suitable for specific disabilities, while ensuring the confidentiality of personal data and avoiding labeling.*

B.52*. The inclusion in the educational offer of activities that reflect the language, culture, and traditions of national minorities present in the educational institution, where applicable, or activities specific to intercultural education.*

4.1.12. Well-being, resilience and reducing bullying

The physical, emotional, and mental health of students is essential for learning. A school environment that provides counseling, safe spaces, and health supports students' well-being, resilience and decreases bullying.

Examples from Romania (requirements from national standards)

B.26. *Organizing activities that ensure a numerical and percentage reduction in cases of violence and harassment of children (bullying and mobbing) within the educational institution, as well as preventing cases of child trafficking within the institution.*

C.98*. Facilitating the participation of the majority of teaching staff in professional development programs focused on developing competencies in priority areas established by strategic documents and public policies, such as: health education; creative problem-solving; critical thinking; the European and international dimension of education; managing conflict and bullying situations; legal and financial education; education for diversity, and managing situations of discrimination and segregation, etc.*

C.105. *Revising the educational offer and programmatic documents based on the evaluation of risk factors at the community level that may affect school participation, the well-being of the child/youth, and the achievement of expected outcomes, or identifying measures to improve the identified issues.*

B.83*. Designing and implementing support and remedial activities based on the analysis of academic outcomes regarding school participation, learning results, and well-being.*

4.1.13. Green and digital competences

Aligning education with European climate priorities requires a profound transformation of educational paradigms to address both current societal needs and the demands of transitioning toward sustainability. In the context of an increasingly competitive global economy and pressures to enhance economic productivity, investment in education is akin to the investments made during the first industrial revolution, but with a focus on human capital and the development of competencies necessary to tackle climate challenges (Dahlberg et al., 2007). This approach is supported by the European recognition of education's critical role in preparing a workforce that is adaptable and aware of the environmental impact of human activities. Consequently, European educational policies promote the integration of the green agenda across all levels of the education system, emphasizing the importance of developing transversal competencies related to sustainability, critical thinking, and social responsibility.

4.1.14. Artificial Intelligence (AI) in quality management

Artificial Intelligence (AI) holds transformative potential for quality management in education by providing advanced tools for analysis, monitoring, and continuous improvement. In the context of accelerated digitalization and alignment with the European agenda for inclusive and sustainable education, AI serves as a catalyst for innovation and the optimization of quality assurance processes.

They stress the importance of an ethical framework to guide AI integration, ensuring equitable and responsible implementation.

By integrating AI-based technologies, educational institutions can efficiently collect and analyze vast amounts of data related to student performance, teacher feedback, and stakeholder satisfaction. A key aspect of AI in quality management is its ability to identify complex patterns in educational data that might be overlooked by traditional analysis. For example, machine learning algorithms can detect correlations between pedagogical methods and student outcomes or predict dropout risks based on subtle indicators (Chen et al., 2023). Such predictive analytics enable early interventions and the adaptation of teaching strategies to meet diverse student needs.

Furthermore, AI can support the development of dynamic feedback systems that provide real-time insights to both teachers and students about progress. These systems can automatically evaluate written assignments or digital projects, offering specific and personalized suggestions for improvement. The implementation of such technological solutions fosters a student-centered approach and enhances motivation by promptly recognizing individual progress. Additionally, AI facilitates the continuous evaluation of the educational process by monitoring teacher-student interactions, thereby contributing to sustained quality improvement.

4.1.15. External evaluation for EU trends. ARACIP case

How can ARACIP evaluate all these aspects in quality management?

The Romanian Agency for Quality Assurance in Pre-University Education (ARACIP) employs a comprehensive and multifaceted approach to evaluate quality management in educational institutions, ensuring alignment with national and European standards. To assess the diverse aspects outlined in the provided items (e.g., learning outcomes, student well-being, vocational training, inclusivity, and digitalization), ARACIP utilizes a combination of qualitative and quantitative methods, standardized tools, and stakeholder engagement. Below is an academic explanation of how ARACIP evaluates these aspects, integrating relevant references and aligning with the principles of quality assurance in education.

1. Framework and Methodology for Evaluation

ARACIP's evaluation process is guided by a structured framework outlined in its *External Evaluation Guidelines* (ARACIP, 2023), which align with national legislation (e.g., Law No. 198/2023) and European standards, such as the European Standards and Guidelines (ESG). The agency assesses quality management through three main dimensions: capacity (institutional resources and infrastructure), educational effectiveness (learning outcomes and student well-being), and quality management (leadership, planning, and continuous improvement). These dimensions are evaluated using specific indicators, such as those provided (e.g., B.19, B.26, B.35t, C.88), which target competencies, inclusivity, stakeholder collaboration, and practical training.

2. Evaluation Methods

To comprehensively evaluate quality management, ARACIP employs the following methods, as referenced in the provided context and ARACIP's operational guidelines:

a. Learning process observations

ARACIP evaluators directly observe classroom and extracurricular activities to assess the implementation of learning activities (e.g., B.53, B.62, B.84). These observations focus on:

- The alignment of teaching practices with key competencies, particularly literacy and numeracy (B.54, B.62).
- The integration of digital technologies in learning activities (C.57, B.82).
- The fostering of autonomy and self-regulation through evaluation practices (C.88).
- The creation of a safe and inclusive environment, including measures to reduce bullying and promote well-being (B.26, B.76).

Observations provide qualitative insights into teacher-student interactions, pedagogical approaches, and the application of inclusive and intercultural education principles (B.52, C.7).

b. Questionnaires and surveys

ARACIP administers standardized questionnaires to students, parents, and teachers to collect data on satisfaction, well-being, and perceived educational quality (B.19, B.76). These surveys:

- Assess student participation, learning outcomes, and emotional well-being (B.83, C.105).
- Gather feedback on the relevance of extracurricular activities and their impact on learning outcomes (B.74, B.75).
- Evaluate the effectiveness of support and remedial activities for vulnerable groups (B.77, C.5, C.6).

Statistical processing of survey data (C.89) enables ARACIP to identify trends, risk factors, and areas requiring improvement, supporting data-driven decision-making .

c. Interviews with stakeholders

Interviews with school principals, entrepreneurs, and local community representatives provide a broader perspective on quality management (ARACIP, 2023). These interviews focus on:

- The alignment of vocational training with labor market needs, including the adequacy of workplace training facilities and personnel qualifications (B.8.t, B.35t, B.46t).
- Community engagement in the development of the Institutional Development Plan (PDI) and School Action Plan (PAS) (C.1, C.2, C.3).
- Partnerships with economic operators and NGOs to enhance digitalization and inclusivity (C.39, B.51).

These discussions ensure that educational practices are responsive to local needs and aligned with strategic priorities, such as sustainability and intercultural education (C.4, C.7).

d. Document analysis

ARACIP reviews key institutional documents, such as PAS, and managerial plans, to verify the inclusion of (this evaluation is only through the platform https://aracip.calitate.eu)

- Strategic targets for inclusive education and support for vulnerable groups (C.5, C.6).
- Programs promoting diversity, intercultural education, and European/international dimensions (C.3, C.4, C.7).
- Measures to address risk factors affecting participation and well-being (B.19, C.105).
- Evidence of progress in access to resources, such as teaching materials, libraries, and digital technologies (B.105).

Document analysis ensures that schools' strategic planning aligns with quality assurance standards and legal requirements (B.4.t).

e. Focus on VET education

For vocational and technical education (VET), ARACIP evaluates:

- The quality of practical training stages, ensuring compliance with legal regulations and contractual clauses on occupational health and safety (B.8.t, B.25t, C.21.t).
- The alignment of workplace training facilities and personnel qualifications with professional standards (B.35t, B.46t).

- Collaborative design of workplace learning activities by practice coordinators and enterprise tutors (C.55t).

These evaluations involve site visits to economic operators and analysis of training contracts to confirm that practical training meets industry requirements.

3. Focus Areas in quality management

ARACIP's evaluation process addresses specific aspects of quality management, as outlined in the provided items:

a. Learning outcomes and competencies

ARACIP assesses whether schools define and achieve expected learning outcomes in terms of knowledge, skills, and attitudes (B.57). This includes evaluating the development of key competencies (e.g., literacy, numeracy) through both classroom and extracurricular activities (B.62, B.84). The agency verifies the effectiveness of support and remedial activities in improving learning outcomes (B.65, B.83).

b. Student Well-Being

The systematic evaluation of student well-being (B.76) is a priority, with ARACIP examining evidence of improvements through programs addressing physical, emotional, and mental health (Chen et al., 2023). Initiatives to reduce bullying and violence (B.26) and promote inclusive environments for vulnerable groups (B.77, C.5) are closely monitored.

c. Inclusivity and equity

ARACIP ensures that schools promote inclusivity by integrating vulnerable groups and minorities into educational activities (C.5, C.6, B.52). This involves assessing non-discriminatory practices, equal opportunities, and the provision of accessible formats for students with disabilities (B.51, B.79). The agency also evaluates community-driven initiatives in the PDI/PAS to address local risk factors (C.3, C.105).

d. Digitalization and innovation

The use of information and communication technologies (ICT) in learning and evaluation (C.57, B.82) is a key focus, with ARACIP verifying access to digital resources and their impact on educational quality (B.105). The integration of AI for data analysis and personalized learning is an emerging trend, requiring ethical frameworks to ensure equity.

e. Teacher professional development

ARACIP evaluates the extent to which teachers participate in professional development programs targeting priority areas, such as health education, critical thinking, conflict management, and diversity education (C.98). This ensures that educators are equipped to address contemporary challenges, including bullying and discrimination.

4. Challenges and considerations

Despite its robust methodology, ARACIP faces challenges in evaluating quality management comprehensively:

- **Data complexity:** processing large volumes of data from diverse sources (surveys, observations, interviews) requires advanced analytical tools, where AI could play a transformative role

- **Contextual variability:** differences in resources and needs between urban and rural schools necessitate flexible evaluation criteria
- **Stakeholder engagement:** ensuring meaningful participation from all stakeholders, especially in disadvantaged communities, can be resource-intensive

5. Integration of AI and emerging trends

AI enhances ARACIP's evaluation capabilities by enabling predictive analytics to identify dropout risks and tailor interventions. Dynamic feedback systems powered by AI provide real-time insights into student progress, supporting personalized learning. However, ARACIP must ensure that AI integration adheres to ethical principles to avoid exacerbating inequalities, particularly in under-resourced schools**.**

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4.2 Internal QA in VET Institutions - New Trends and Challenges in the EU

Learning outcomes

In this chapter, you will learn about the latest trends in the digitalization of learning and how these tools can be used in the design of VET. It's a glimpse into the future.

You are invited to assess the added value of these digital tools and its potential use in your organization and in your teaching activities.

You will learn about some implications for the further training of VET teachers and trainers and able to assess any corresponding training needs for yourself and your organization.

Finally, you are invited to explore potential sources from which you could obtain support or financial assistance for the use of these digital tools in your organization.

This section presents the latest developments in the digitalization of teaching and learning in VET schools and illustrates the potential impact of digital technologies on all areas of VET and other education systems. In a fast-developing technical world it is vital to continuously improve the effectiveness and efficiency of education and training and support new teaching and learning approaches, including through newly emerging digital tools. The presented tools and initiatives highlight that digital education and training has the potential to create more and better opportunities for learning and teaching for everyone, although probably not every tool will prove successful.

Most of the innovative digital tools presented here are still experimental in nature and, in some cases, still far from widespread use. The current challenge in the EU is about technical

refinement and upscaling of these tools. The challenges with quality assurance arise primarily in technical and economical regard, but rarely from a pedagogical perspective. To determine the benefits, added value, and conditions for successful use of these tools for teaching and learning, further practical testing and empirical research are necessary. It is vital that learners are not just making use of these tools, but understand the functioning of underlying technologies, and develop skills and competences for a creative, safe, ethical and responsible use of these technologies.

As already mentioned in Chapter 1, a steering framework for promoting the digital transition in the education sector exists for EU countries, with guidelines for further action. The EU Commission also provides financial resources to support the development of digital tools for teaching and learning.

4.2.1 Supporting the professional orientation of learners

Digital technologies can be used to help potential VET students develop a better understanding of the opportunities provided by certain VET programs, for example by attending webinars with employers, by watching videos where former apprentices tell their educational and career stories, and by actively exploring their future workplaces through VR and 360-degree video experiences.

Providing insights into professions with Virtual Reality

In Switzerland the Valais Association of Master Builders and the HES-SO Valais-Wallis University of Applied Sciences are using immersion and VR to counteract the lack of young talent in the construction industry.

With VR glasses, young people can immerse themselves in the day-to-day work of various construction professions, choosing from more than a dozen 360-degree videos. These were conceived and filmed in collaboration with the professional associations involved in the Valais Canton.

The films show various typical work situations of a particular profession.

Source: ILO 2022, p. 185.

4.2.2 Improving learning through innovative technologies

VET programs can be fertile ground for the development and implementation of types of technologies that further enhance experimental aspects of learning. Notable examples include video annotation technology and simulations like Augmented and Virtual Reality.

Video-annotation is a feature provided by some hyper-video platforms and can be used to enhance the process of reflection by learners. Reflection is essential for professional competence development in every profession and teachers and trainers can use the annotation of videos, perhaps shot by the students themselves during a particular activity, to support students' reflection on professional practices at work, by connecting implicit and procedural knowledge with theoretical knowledge. Video-annotation facilitates individual

reflection on workplace real or simulated practices and helps to understand what elements of practices are important or controversial and to add theoretical knowledge to workplace experiences.

Video annotation in Swiss health care education

Video, and more specifically hyper-video, is used to stimulate reflection of professional practice in a health care program in Switzerland. Video are used to record the apprentices' relevant procedures (for example, the most difficult or the most important to perform a specific task). The video-material is then imported on iVideo.education, a digital platform specifically designed to turn simple videos into hyper-videos for professional training purposes.

iVideo allows the trainers to highlight critical incidents within the video for instance by adding simple animations like active points to stimulate the apprentice reflection. Moreover, students and teachers can insert comments in specific video timeframes (so called video annotations), which allows more detailed and focused feedback from the supervisors. Students are also asked to design hyper-videos as a learning resource for their peers.

Source: ILO 2022, p. 188.

Simulations can be carried out in both physical spaces through the support of digital technologies, and also in virtual environments accessed through a screen or through head-mounted displays with immersive Virtual Reality (VR). Simulations have long been known to make theoretical knowledge more relevant and facilitate making sense of practical situations in the workplace, as well as offering a range of other benefits, for example, enabling more realistic practical experiences which otherwise would not be possible for reasons of cost or lack of workplace access, allowing activities to be repeated more quickly and with less supervision, enabling learners to access training at their convenience and with less risk of injury.

Recent developments have taken a further step forward. *Immersive 3D Virtual Reality* environments, for example, have been found to outperform desktop or table VR experiences because learners have a higher sense of presence in the immersive VR experience.

VR to simulate professional practice training

GardenVR is an Immersive 3D VR experience which allows students to practice and develop their designing skills through designing a garden and exploring it in an immersive environment. Developed by EPFL within the context of the project DUAL-T, GardenVR was applied with gardener students in Swiss VET schools.

In the design mode, the learners are given the top view of the garden, and they can place objects such as trees in the garden. In the explore mode instead learners can explore the garden by walking through it in a 360-degree 3D environment. That way they can experiment different solutions before completing their garden. For instance, they can plant

a tree, observe the consequence, and undo the action. Moreover, learners can fast-forward the time to visualize the evolution of the garden supporting.

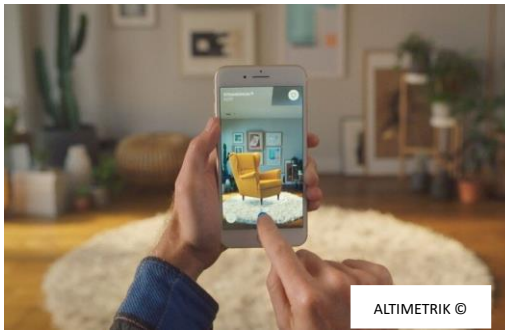
Source: ILO 2022, p. 189.

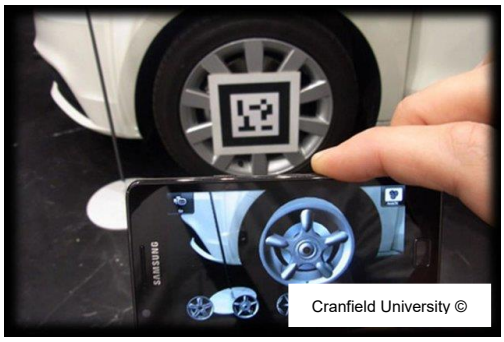
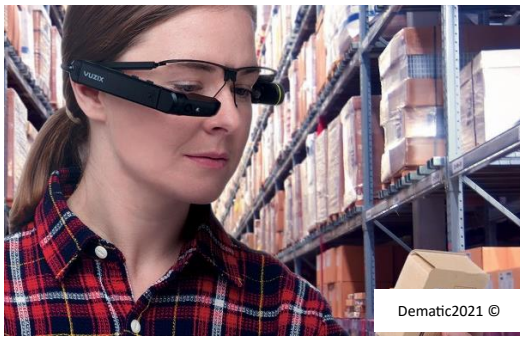
Augmented Reality (AR), overlays the physical world with virtual content to create an immersive platform which places the learner in a real-world context, engaging all senses. AR has been shown to be particularly effective to support and scaffold procedures within real workplaces. AR smart glasses seem to be the most promising type of AR device for workplace learning because learners can manipulate objects and execute tasks without any constriction.

The latest AR systems can communicate with various sensors (cameras, pressure sensors, eye-trackers) in real time, which can offer an even broader range of training affordances. Sensor-based AR training environments can support learners by providing personalized guidance and feedback when company tutors are not available or in-remote working.

The focus here has been on the latest tech, which is evidently 'high-tech'. This is not to ignore the other types of technology, 'low-tech, high-tech and no tech' all have a place in education and training, and AR applications can be available on smartphones, making it much more accessible. What matters is what teachers and trainers do with the technology as much as the technology itself.

Different forms of Augmented Reality

		Device	
		Handheld	Hands-free
Input	Marker-less	 A user using a tablet's camera (handheld) to frame physical objects (marker-less) to access virtual content	 A user wearing smart glasses (hands-free). By looking at physical objects in the environment (marker-less), it is possible to access virtual content

Marker-based	 A user using a smartphone camera (handheld) to frame a QR code (marker-based) to access virtual content	 A user wearing smart glasses (hands-free). By looking at the QR code (marker-based), it is possible to access virtual content

Source: ILO 2022, p. 191

Digital technology also allows to capture and present evidence of achievement in education as a means of supporting all forms of assessment. Recent advances in learning analytics have the potential to foster change in the efficiency and effectiveness of assessment, and the ability to respond to continuing and rapid changes in skills in the workplace.

Computerised competence-based assessment

With the ASCOT+ project, Germany's Federal Ministry for Education and Research is supporting the development of digital training and assessment for vocational skills in different domains (from car mechatronics to socio-emotional skills in nursing). In addition to digital training units using videos and simulations, the project is developing assessments that will be used as exams to certify learners' skills.

For example, an office simulation is being developed that fosters the problem-solving competence of trainees in the occupations of industrial clerks and office management clerks, recording their trouble-shooting performances. To this end, authentic problem scenarios are developed for processing within the office simulation.

The software deployed makes use of several innovative technologies. (Partly) automated procedures for the evaluation of written responses are being put into place to efficiently assess the test results of large groups of participants. The software also analyses the problem-solving competence of learners in real time and uses these data analyses as a basis for providing individualised support.

Source: ILO 2022, p. 192.

4.2.3 Enhancing the coordination of learning

The proliferation of digital tools and the extension of technology in new ways into areas such as learning, assessment and certification raise important issues around how to manage and coordinate education and training systems that are likely to become increasingly complex.

One model for how to deal with these issues, which seeks to create spaces for reflective practices in VET educational systems through the support of digital technologies, is the *Erfahrraum* model, which is a technology-enhanced pedagogical model for supporting students' learning at the borders between vocational learning locations. According to the model, when adequately exploited, technologies can provide a specific space to reflect upon the learners' professional experiences, thus supporting learning and professional development. Another practical solution is the REALTO platform, shown in the box below.

Learning management systems for VET

The **REALTO platform** aims to achieve better integration between schools and workplaces by using a combination of mobile devices and an online learning environment. VET programs can suffer from fragmentation such that knowledge acquired in one learning context is not applied in another.

Developed by the Swiss Leading House DUAL-T, the app enables theoretical knowledge acquired at school to become more understandable and relevant by connecting it to specific examples of workplace experiences; and experiences from the workplace can be used to build connections to knowledge learned in the school context.

Teachers can get learners to collect photos in the workplace about a certain topic so that their practical examples can be used to illustrate abstract concepts back at school.

Moreover, learners can interact with peers in a social network environment (based on posts, comments, messages, likes and sharing), manipulate images through, annotations, overlay and grouping and create workplace-oriented customizable learning journals (Learning Documentations).

Source: ILO 2022, p. 193.

Technology is also generating new ways of monitoring the progress of learners. Learning Analytics (LA) concerns the measurement, collection, analysis and reporting of data about learners and their context for purposes of understanding, optimizing learning and the environment in which it occurs.

Educational learning platforms and tools often collect and store data on learners' activities including their written texts, time spent within a task, navigation behaviour and so on. Increasingly, with the development of artificial intelligence, the possibilities to personalise learning are growing ever more sophisticated, and the range of possible applications is expanding, e.g., LA could help institutions better understand students' future employment prospects, promote better educational and vocational planning and address issues like premature drop-out.

Digital tools to reduce dropout rates and increase success rates

In Helsinki (Finland), an AI-based system (AI-HOKS) has been developed to help limit the risk of VET students, dropping out and maximise their chances of graduating. Its goal is to identify as early as possible the circumstances and phase of learning when students will most likely need support, and to provide automated and semi-automated support (e.g., mobile coaching).

To do this it uses information from the personal competence development plan which all students have, data on the use of tools and learning environments, weekly surveys sent to students' cell phones and student feedback.

Source: ILO 2022, p. 196.

4.2.4 Training for Teachers and in-company Trainers

Technology should support teachers and trainers and not replace them, being used wisely so that machines and humans each play to their strengths. Indeed, digital transition will need not just technology but the full engagement of teachers and trainers. It will need to complement the human role rather than replace it completely. Teachers and trainers will therefore need opportunities to develop the skills they need. Training for teachers and in-company trainers must be an integral part of any strategy for digital transition in VET, empowering them in a way that they are not just consumers of tech learning 'products' but being able to co-create materials and applications through open-source tools.

Increasingly, digital transition is not only reshaping classroom activities but also redefining how students, teachers, trainers, and employers connect and engage with one another. From interactive learning platforms and adaptive assessment tools to immersive virtual environments, these innovations are making VET more accessible, personalised, and engaging.

Artificial Intelligence (AI) is transforming education. The Finish education system is already preparing for an AI-driven future. Courses are offered for educators and school leaders to impart an in-depth understanding of AI's impact on education. Participants get insights into AI integration, learn new teaching styles and learning approaches facilitated by AI, discover various AI tools and applications suitable for classroom use, and learn to create AI-supported learning environments.

Source: Euneos 2025

The integration of digital tools into VET schools must be approached thoughtfully, balancing experimentation with rigorous evaluation. Stakeholders - including teachers, trainers, students, policymakers, and technology developers - must collaborate to establish frameworks that not only support technical advancement but also ensure pedagogical soundness. This involves setting clear quality criteria for what constitutes effective digital learning experiences, gathering evidence through pilot programs, and creating platforms for sharing best practices across institutions.

4.2.5 Challenges for Quality Assurance in the digital and green transformation of VET

So far, most of the approaches and tools presented in the previous sections are not widely used by VET provider organizations in the EU. Therefore, there is little systematic experience with quality assurance when using these innovative instruments.

One conclusion is certainly obvious: a comprehensive approach to QA will combine curriculum updates with investments in teacher and trainer development. Aligning VET programmes with emerging digital and green skills involves appropriate environmental contents and ensuring that teachers and trainers have the resources, the skills and confidence to implement the necessary changes. Ongoing professional development is vital for all staff to stay abreast of the rapid evolution in both technology and sustainable practices. Crucial questions before implementing new innovative tools are: Do teachers and trainers possess the necessary skills and training to make effective use of the technologies, and are ongoing professional development opportunities accessible? The extent to which new tools are actively incorporated into classroom and workshop practice, and the satisfaction levels among staff and learners, will provide valuable insights into the effectiveness of these tools.

Another prerequisite for ensuring the quality of innovative tools is collaboration and exchange among learners, teachers, and industry professionals. Work-based, case-based, and project-based learning must be developed and implemented, and stakeholders' experience with them must be assessed and evaluated.

In quality terms, it is no less important that VET institutions critically assess their digital infrastructure. This begins with a thorough evaluation of both hardware and software resources - identifying which innovative tools are available, their degree of integration into teaching and learning, and their operational reliability. Key considerations will include whether the IT unit of the VET provider oversees maintenance and updates, the existence of a structured maintenance schedule, and the strength of cybersecurity protections.

Institutions might also consider the green implications of digital choices: are cloud services powered by renewable energy? Do procurement policies prioritise devices with minimal environmental impact? These issues will provide indications whether the digital infrastructure of an institution is keeping pace with the aspirations of green and sustainable education.

A strategy that integrates innovative technical resources, skilled staff, and a commitment to sustainability will empower VET institutions to meet the challenges of the digital and green transformation. By fostering a culture of innovation, VET providers will remain agile in the face of technological change and evolving environmental standards. Strategic collaborations with industry, technology partners, and peer institutions may unlock new avenues for sharing best practices to ensure and improve the quality of VET programs.

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Chapter 5: Self-assessment of your learning progress

Learning outcomes

In this final chapter, you can review your learning achievements. Each chapter contains a series of questions addressing the most important learning outcomes. You are invited to answer these questions.

To answer the questions, you can refer to the text in the chapters. At the end of this chapter, you will find brief answers to the questions asked. You can use these answers also to check whether and to what extent your answers match with the questions asked.

5.1. Questions

Chapter 1

Q 1.1: The EU does not have legislative power in vocational education and training (VET). Education policy remains under national sovereignty, and the EU cannot issue binding laws. Which approach is applied by the EU instead to strengthen the quality of VET in the Member States?

Q 1.2: In the EU, key frameworks such as the European Qualifications Framework (EQF) and the European Credit System for Vocational Education and Training (ECVET) have been established.

What is the function of EQF?

What is the function of ECVET?

Q 1.3: Which approach is pursued by the EU to advance the digital and green transition of VET systems?

Q 1.4: In 2005, the EQAVET platform has been established promoting a common quality framework in VET through experience sharing and voluntary application in EU Member States and associated countries. It is based on the PDCA cycle, accompanied with ten quality indicators and six Building Blocks.

What is the function of the PDCA-cycle?

What is the purpose of the indicators?

What is the purpose of the building blocks?

Chapter 2

Q 2.1. How does the process of external quality assurance in Vocational Education and Training (VET) differ between countries with developed economies, such as Finland and Luxembourg, and countries with developing economies, such as Romania and Poland? What are the challenges?

Q 2.2. What does data-driven innovation mean in the context of quality assurance in VET, and what benefits and challenges are associated with this approach?

Q 2.3. Based on the example of the ARACIP platform in collecting and managing data for the external evaluation of VET schools, what could be the added value of such a mechanism?

Q 2.4. What are the criteria and stages of selection for external evaluators in Romania, and what measures are taken to ensure the quality of their work? Drawing from this example, how should external evaluators be trained to ensure their competencies are developed to the highest level?

Chapter 3

Q 3.1 What are the main strategies in EU countries to strengthen connections of VET providers with the labour market?

Q 3.2 What means competence-based teaching and learning and which challenges does it entail?

Q 3.3 What makes the difference between self-assessment and quality management in a VET school?

Q 3.4 What are the practical benefits in using the Ishikawa diagram?

Q 3.5 What are the essentials of an improvement plan?

Q 3.6 What are the potentials of micro-credentials in supporting rapid adaptations of curricula in response to technological developments in the digital sector?

Q 3.7 Digital transformation requires teachers and in-company trainers to develop advanced digital skills, which must be imparted through continuous professional development. Some EU countries have implemented successful programs. How do these programs proceed to equip as many teachers as possible with the necessary digital skills?

Q 3.8 The green transformation is transforming existing professions and creating new ones. Which professional fields are affected, and what kind of skills are needed?

Q 3.9 What does it mean to create green learning environments?

Chapter 4

Q 4.1.1. How does the clear definition of learning outcomes, according to Romanian standards, contribute to aligning the VET curriculum with labor market requirements and the development of transversal competencies?

Q 4.1.2. How do intrinsic and extrinsic motivation influence student engagement in VET, and what specific strategies from Romanian standards support the creation of a stimulating learning environment?

Q 4.1.3. How do digital platforms and formative feedback, according to ARACIP practices, facilitate the external quality evaluation process in VET, and what challenges arise?

Q 4.1.4. How can an educational environment that values errors as learning opportunities contribute to developing a growth mindset among VET students?

Q 4.1.5. What specific measures do Romanian standards provide for addressing socio-economic barriers and promoting inclusion in VET, especially for vulnerable groups?

Q 4.1.6. How can teacher leadership strategies and student autonomy, supported by Romanian standards, promote self-regulation and self-awareness in disadvantaged contexts?

Q 4.1.7. What role do collaborative partnerships between schools, families, and economic operators play in improving educational outcomes and aligning VET with labor market requirements in Romania?

Q 4.2.1 Innovative technologies such as virtual reality, augmented reality, and learning analytics offer diverse opportunities to improve learning processes in VET institutions. What are the potential benefits in using virtual reality and 360-degree videos?

Q 4.2.2 What are the potential benefits in using video annotation and smart glasses with augmented reality?

Q 4.2.3 Are there any options to use digital technologies for assessments in VET?

Q 4.2.4 What should be considered when designing an approach for quality assurance of digital and green innovations in VET?

5.2. Answers

Chapter 1

A 1.1 Quality assurance in VET within the EU is based on a coordinating approach. The EU promotes cooperation, mobility, and the exchange of best practices to create a common quality base and facilitate the recognition of qualifications without compromising national sovereignty. European recommendations are non-binding and serve as guidelines for quality assurance in VET.

A 1.2 The EQF classifies qualifications into eight competence levels for better comparability and mutual recognition of degrees between Member States. ECVET supports the recognition of competences of learners and learning outcomes of training units to promote the mobility of learners and professionals across Europe.

A 1.3 The EU promotes digital and green skills and infrastructure in VET and adopted non-binding recommendations for digital education and green skills in 2023. Member States are invited to integrate digital and green skills into VET programs to support sustainable development and employability.

A 1.4 The PDCA cycle is applied to ensure accountability and continuous improvement through thoughtful planning, monitoring, self-assessment, evaluation, and improvement to keep VET institutions all over Europe competitive and relevant.

The ten indicators assess items such as the relevance of quality systems, teacher training, participation rates and completion rates of students in VET and VET programmes, consideration of disadvantaged groups, and employment effects for graduates.

The Building Blocks address the major challenges of quality management systems in VET and provide guidelines for ensuring and developing quality at the system and provider levels.

Chapter 2

A 2.1. Developed economies (Finland, Luxembourg) use robust resources, digital tools, and authentic assessments, with strong employer ties. Developing economies (Romania, Poland) rely on EU funds, facing resource and infrastructure limitations. Challenges include logistical costs (Finland), multilingualism (Luxembourg), limited resources and employer engagement (Romania), and rural-urban disparities (Poland). Balancing standardization with local needs is a common issue.

A.2.2. Data-driven innovation in VET uses data to optimize quality assurance, aligning programs with market needs. Benefits include faster evaluations, objective decisions, and better alignment with labor demands. Challenges involve incomplete data, GDPR compliance, limited digital infrastructure, and high costs. Training gaps slow adoption, especially in developing economies.

A.2.3. The ARACIP platform standardizes data collection, enhances transparency, and supports real-time monitoring for VET evaluations. It reduces bureaucracy, aligns with EQAVET, and enables evidence-based decisions. Dashboards aid schools and ARACIP in tracking performance, fostering continuous improvement via the PDCA cycle and supporting EU-funded reforms.

A 3.3. Romania's evaluators are selected based on VET teaching experience, evaluation expertise, and training. Stages include CV submission, interviews, practical training, and annual evaluations. Training should include EQAVET standards, digital tools, authentic assessments, and soft skills, with continuous development and peer learning to ensure objectivity and alignment with modern demands

Chapter 3

A 3.1 Main strategies to strengthen connections of VET schools with companies are promoting of dual learning (in school and in companies), strengthening practice-oriented learning in VET schools and adapting curricula more flexibly to the needs of the labor market.

A 3.2 Competence-based learning is based on real-life job requirements and ensures that graduates have mastered all the necessary skills before being certified. This method promotes close integration of school-based and work-based learning, but places high demands on teaching staff, equipment, and organization.

A 3.3 Quality Management within the EU is primarily based on self-assessments, which often face difficulties in implementing the full PDCA cycle, particularly in the transition from

review and evaluation towards change and improvement. To counteract this, several countries are promoting the establishment of a comprehensive internal quality management system.

A 3.4 Analysing performance data against quality objectives enables the identification of successes and weaknesses. The application of the Ishikawa diagram is helpful in identifying causes of quality outcomes and initiating targeted improvements.

A 3.5 An improvement plan based on the analysis of performance, challenges, and resources includes both corrective activities to address immediate deficiencies and adaptive activities for structural changes. This plan is implemented in a detailed action plan with responsibilities, resources, timeframes, and evaluation indicators.

A 3.6 Micro-credentials and digital badges offer flexible options for rapid and targeted skill enhancements. However, challenges remain regarding quality assurance and recognition of these sharpened offerings.

A 3.7 Some countries have developed successful digital skills programs for teachers, who also received support for using and updating digital resources. Other countries have established specialized roles such as "Digital Facilitators" or "Digital Animators" to promote digitalization in VET schools.

A 3.8 New jobs are created, and existing professions are transformed particularly in the fields of renewable energy and environmental management. The impact on skill requirements varies depending on the skill level, with transversal core skills such as environmental awareness, adaptability, teamwork, and entrepreneurial thinking being emphasized.

A 3.9 Creating green learning environments: In addition to adapting the content, the design of the learning environment is important, for example, through "campus greening" with sustainable waste management and carbon footprint measurements.

Chapter 4

A 4.1.1. The clear definition of learning outcomes aligns the VET curriculum with labor market needs by focusing on key competencies, such as literacy and numeracy. This facilitates the assessment of academic and practical progress, promoting transversal competencies (critical thinking, collaboration) essential for holistic development, ensuring educational relevance and graduate employability.

A 4.1.2. Intrinsic motivation (autonomy) and extrinsic motivation (feedback, resources) enhance student engagement in VET. Romanian standards promote collaborative design of practical activities and aligned staff qualifications, creating relevant learning environments. These strategies, supported by constructive feedback, boost student interest and involvement, particularly in disadvantaged contexts.

A 4.1.3. Formative feedback identifies areas for improvement, but challenges include data complexity, contextual variability between schools, and the need for training to effectively use technology, especially in rural areas

A 4.1.4. An environment valuing errors fosters a growth mindset through formative feedback and risk management. Defining competencies and collecting data on risk factors enable personalized approaches, promoting resilience and critical thinking, essential for VET students' success, particularly in challenging socio-economic contexts

A 4.1.5. Accessible formats and data protection ensure equity, reducing socio-economic barriers. These measures enhance school participation and educational outcomes for minorities and students with disabilities, creating an inclusive environment.

A 4.1.6. Teacher leadership, via achievable goals and project-based learning, fosters self-awareness, helping students in disadvantaged contexts overcome socio-economic barriers and manage their learning effectively

A 4.1.7. Partnerships enhance educational outcomes by aligning practical training with professional standards and market needs. Collaboration with economic operators provides resources and job opportunities, reducing dropout rates. Contracts ensure safe and relevant internships, boosting VET graduates' employability, as seen in networks in Timiș and Cluj

A 4.2.1 Virtual reality and 360-degree videos could enable learners to experience professions realistically and thus promote career guidance, as shown in an example from Switzerland.

A 4.2.2 Video annotation can support reflection on professional practice, while augmented reality may offer realistic, safe, and flexible learning opportunities. AR smart glasses are particularly promising for use in the workplace.

A 4.2.3 Digital tools may allow competence-based assessments through simulation-based exams and automated evaluations of professional competences.

A 4.2.4 Implementation of digital and sustainable technologies requires a comprehensive QA strategy that integrates curriculum, infrastructure, staff development, and ecological aspects. Collaboration with industry and continuous exchange of experience are essential.

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