BRIDGES 5.0 MASTERCLASS: VET and Industry 5.0

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Transformation of VET programmes towards Industry 5.0 through Learning Factories 5.0

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Agenda

1. The Basque VET System — why it's a good laboratory
2. The I5.0 gap — what's missing and why it's hard to change
3. Learning Factories 5.0 — the approach and what it looks like in practice
4. Results, recommendations and what's next

BASQUE VET SYSTEM

1. **Alignment with regional strategies**, Smart specialisation.
2. **Multifunctional education centres:** training-entrepreneurship – strategic partnerships
3. Collaboration **with businesses, universities, tech hubs and governments**

Capacity for self-government thanks to its own financial system

How the Basque VET Strategy 2030 Aligns with Industry 5.0

Human-centric foundation

- Learner at the centre (ETHAZI)
- Strong focus on transversal skills (teamwork, autonomy) (ETHAZI)
- Inclusion and guidance systems

Skills ecosystem designed for **adaptability**

- Lifelong learning & reskilling
- Flexible and modular pathways

Sustainability is present

- Green skills and circular economy
- Projects linked to low-carbon transition

Strong social dimension

- Equity and gender equality policies
- Focus on employability across diverse populations

Gaps Between VET Strategy 2030 and Industry 5.0

•**Administrative and Regulatory Inertia:** Structural rigidity in occupational standards, qualification frameworks, and funding mechanisms slows down the integration of Industry 5.0 competences**.**

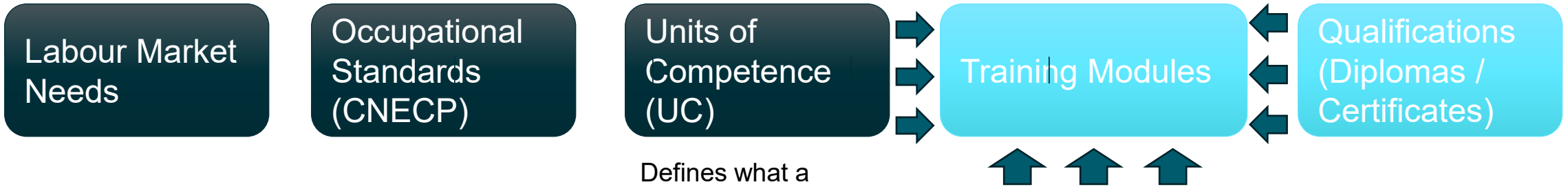
•**Pedagogical and Operational Integration Gap:** The established ETHAZI model provides a strong foundation for integrating Industry 5.0 principles. However, further development is needed in methodologies, teaching practices, and assessment frameworks.

•**Need for integration of Socio-Technical Transformation:** The system prioritises skills development but lacks mechanisms to address organisational change, work design, and participatory production models.

Levers for Change: Content and Delivery Methods

INCUAL. (Spanish Level)

VET delivery.
Adapted (partially) to specific needs



- The Spanish occupational standards system is historically rooted in an Industry 4.0 paradigm, and its current updates have not yet structurally integrated Industry 5.0 concepts.
- The update of the occupational standards can take 3 to 5 years

Levers for change

CHANGES at TRAINING CONTENTS and DELIVERY METHODS LEVEL

1.- Specific courses for industry 5.0
2.- Embedded in the training modules and contents

By updating the
training delivery methods:
Learning Factories 5.0

What makes a Learning Factories 5.0

How Learning Factories 5.0 Enable Integration

1. Competences and Culture

- Human-centric / Resilient / Sustainable culture
- Learning in **socio-technical contexts**, not isolated tasks

2.-Human–Technology Interaction and ergonomics

- Human empowerment over technological control
- Operator-centred technologies (enhancement approach)
- Human factors assessment methods

3. Work Organisation Models

- Interdisciplinarity, polyvalence and collaborative leadership
- HIWS*: Autonomy, transparency and shared goals, well-being and purpose driven work

What is a Learning Factory?

"a close-to-reality factory environment for education, training, and research purposes, which enables experiential learning in a realistic industrial setting." (Abele et al., 2017)

* HIWS: high-involvement work systems

See It in Action: Ikas-fabrika - Learning Factory

Watch how students work in the learning factory in this link:

https://www.youtube.com/watch?v=A_11bwg1cHg&t=43s

Actions to integrate Industry 5.0 within the Basque VET

Pilots
Bridges5.0

Industry 5.0 values into its **Smart Manufacturing program's** curriculum.

I5.0 contents in the curriculum

Optative subject: **Ikas Fabrika: Interdisciplinary activities** in learning factory

Systemic actions

Creation of **22 Learning factories** (i4.0) across the region.

From pilot to systemic change: proving that Industry 5.0 values can be embedded in VET

34
students in pilot
Bridges5.0 pilot, 2024-25

70
students in scale-up
6 study programmes, Sep 2025-Feb 2026

22
Learning Factories approved
Basque Government, 2024

Ongoing international activities

Bridges5.0

Workforce skills for I5.0.

Experiments with Teaching and Learning Factories

LF4VET

Scale up pf Bridges wp6, learning factories 5.0

Technology integration and pedagogies for LF5.0

LCAMP ALLIANCE.

An outcome of the LCAMP CoVE.
A network of VET providers in manufacturing sector.
45 members 5 countries

SKILLAIILITY

Symbiotic complementarities between AI, automation, and human tasks in Learning Factories

Results, What did the Learning Factories achieve?

The Learning Factory 5.0 pilots show that education systems are capable of integrating Industry 5.0 values in meaningful ways,

Main results include:

Clear progress on Industry 5.0 values

Educational institutions reported measurable improvements in the integration of human-centricity, sustainability, and resilience

Renewal of curricula and didactics

Learning Factories 5.0 triggered reflection on existing Industry 4.0-oriented education, which was often seen as too technology-driven. Teachers redesigned courses, introduced interdisciplinary into project-based learning, and experimented with new teaching tools and methods that better reflect Industry 5.0 values.

Positive learning experiences for students and trainees

Students generally valued the Learning Factory approach. Active participation, collaboration, and real-world relevance increased engagement and understanding. Learners developed not only technical skills, but also transversal skills such as teamwork, communication, decision-making, and reflection on human-centred work.

Stronger links between education and business ecosystems

The pilot's Learning Factories functioned as shared spaces where education institutions, companies, and intermediary organisations could meet. This helped align educational programmes with evolving skills needs in industry and allowed companies to benefit from new ideas, methods, and talent.

At the same time, the pilots revealed challenges. Sustainability was often harder to integrate than human-centricity, abstract concepts were sometimes difficult for learners to grasp, and embedding change structurally requires long-term commitment beyond pilot projects.

Strategic Recommendations for Industry 5.0 Preparedness

What does this mean for education, industry, and policy?

The Learning Factory 5.0 findings underline that Industry 5.0 transformation must start early—during education and training.

For education and training systems

Learning Factories show that educational renewal is possible without abandoning existing structures.

Preparing learners for Industry 5.0 requires more than technical skills; it requires attention to values, work organisation, and societal impact.

Long-term vision, institutional support, and professional development for teachers are essential to sustain change.

For companies and labour markets

Graduates exposed to Industry 5.0 thinking are better equipped to contribute to human-centred, sustainable, and resilient organisations.

Cooperation with education institutions is a strategic investment in future skills and organisational adaptability.

For policymakers

Learning Factories, require public investment and policy support.

There is no single model for Learning Factory 5.0; diversity of approaches should be encouraged.

International collaboration and networks are crucial for sharing experiences, developing frameworks, and scaling up successful practices.

Thank you

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https://bridges5-0.eu/

https://lf4vet.eu/

https://lcamp.eu/