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SWISS FEDERAL UNIVERSITY FOR VOCATIONAL EDUCATION AND TRAINING

Swiss excellence in vocational education and training

THE DIGITAL TRANSFORMATION OF APPRENTICESHIPS: EMERGING OPPORTUNITIES AND BARRIERS

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Cedefop and OECD symposium | Apprenticeships and the digital transition

Thessaloniki, 15 June 2023

The Apprenticeship Development for Universal Lifelong Learning and Training (ADULT)

Global policy research on innovative strategies to modernize apprenticeships based on the following themes:

1. Adapting apprenticeships for reskilling and upskilling of adults and older workers;
2. Promoting apprenticeships to meet skills needs of the digital and knowledge economy;
3. Using technology to strengthen the effectiveness and efficiency of implementing apprenticeships;
4. Enhancing the participation of enterprises, specifically SMEs, in offering apprenticeship opportunities;
5. Improving the attractiveness and social perception of apprenticeships including promoting pathways to higher education;
6. Introducing or strengthening dual training through traineeships, internships and any other work based learning programme in addition to apprenticeships with the school-based VET;
7. Upgrading the quality and credibility of apprenticeships in the informal economy.

Country-level research reports on innovative strategies to modernize apprenticeships in four countries (one each from Americas, Asia, Africa and Europe): Dominican Republic; Finland; India and South Africa

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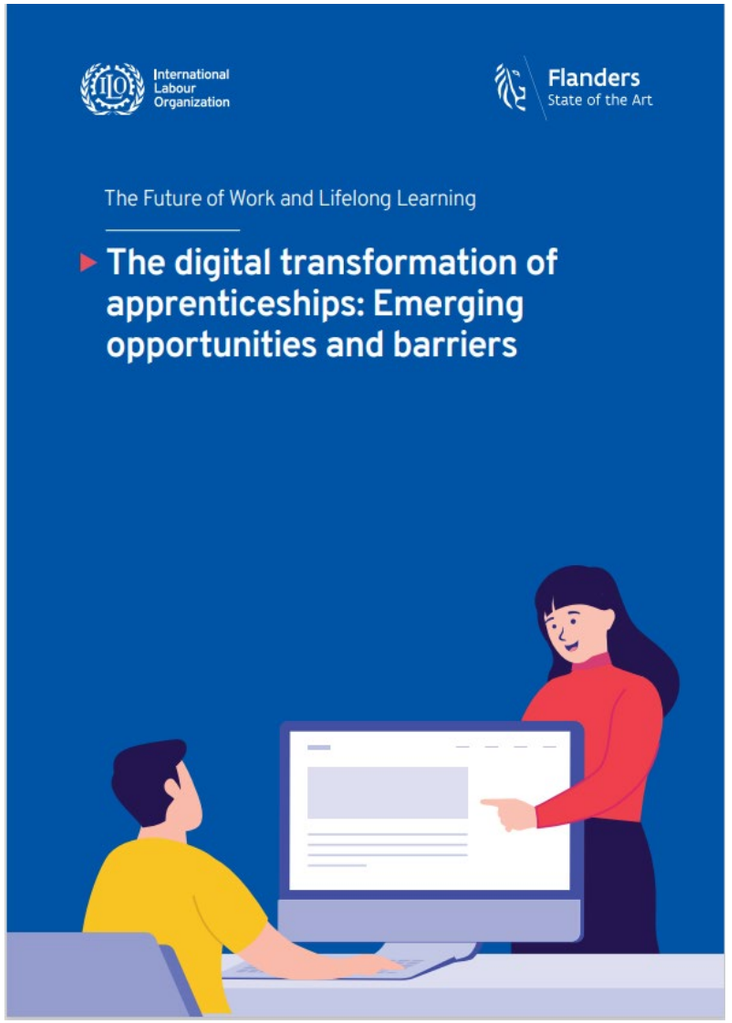
Theme 3: Digital transformation of apprenticeship systems



Report drafted by Dr. Francesca Amenduni and Prof. Alberto Cattaneo from SFUVET

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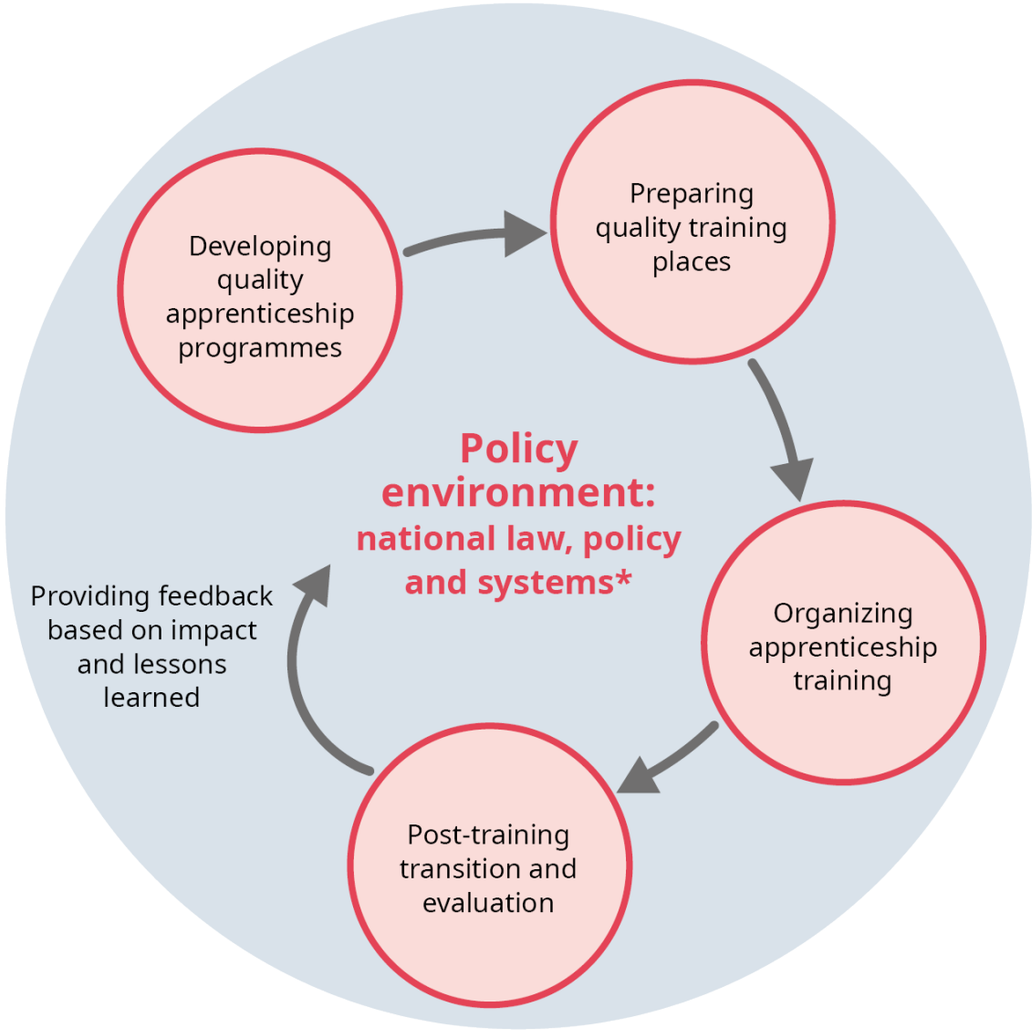

Stage	Key digital transformation	Key challenges and threats
Developing quality apprenticeship programme	• The use of big data for job market analysis • The development of international framework for digital credentials and badges enhanced by blockchain	• Quality, reliability, and feasibility of big data analysis, especially for developing countries • Poor level of interoperability of digital credentials and badges
Preparing quality training places	• Dedicated platforms for providing complementary off- or on-the-job training • The introduction of the role of digital experts/facilitators in apprenticeship programmes	• Resources for negotiating, scaling up, and community management • Lack of digital skills framework for digital educators in TVET
Organising apprenticeship training	• The use of extended-reality technologies (AR, VR, 360-degree videos) and game-based simulations to develop and assess professional competences	• Technical issues, costs of development, infrastructural requirements; • Research on pedagogical designs is needed.
Post-training transition and evaluation	• AI to provide individualized career advice • Learning and educational institution analytics for programme assessment	• Bias reiterated by AI algorithms • Ethical implications around the collection, analysis, and use of personal data

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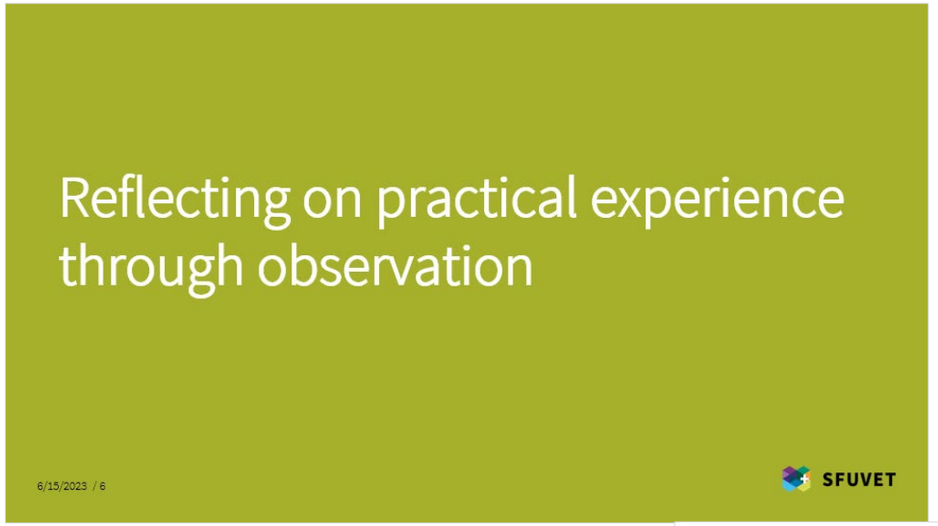
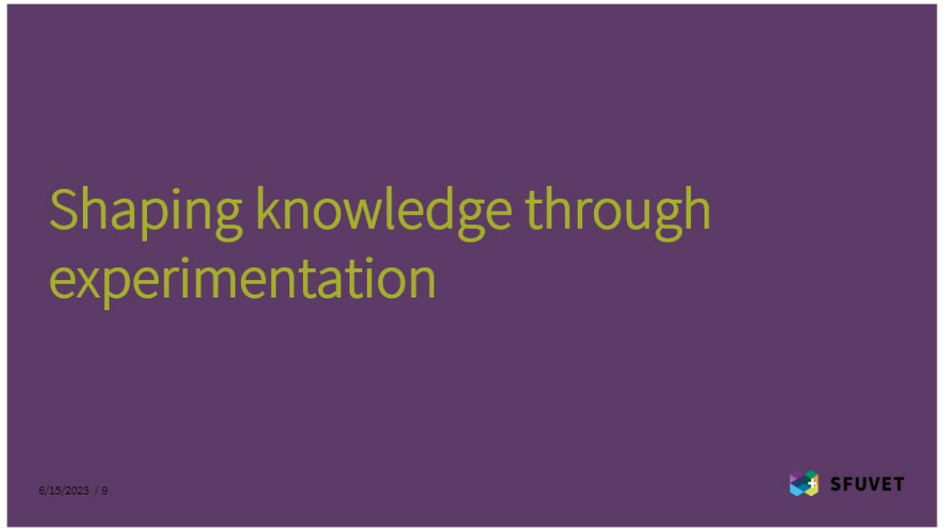
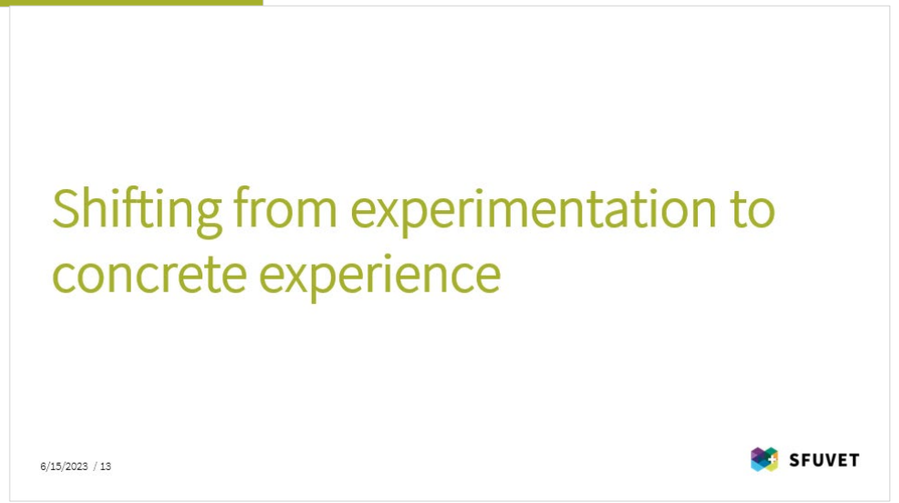
Emerging opportunities: Technologies allow for







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Reflecting on practical experience through observation

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Developing abstract knowledge based on reflective observation

Annotating static pictures through Realto

Co-designing hypervideos - iVideo

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Shaping knowledge through experimentation

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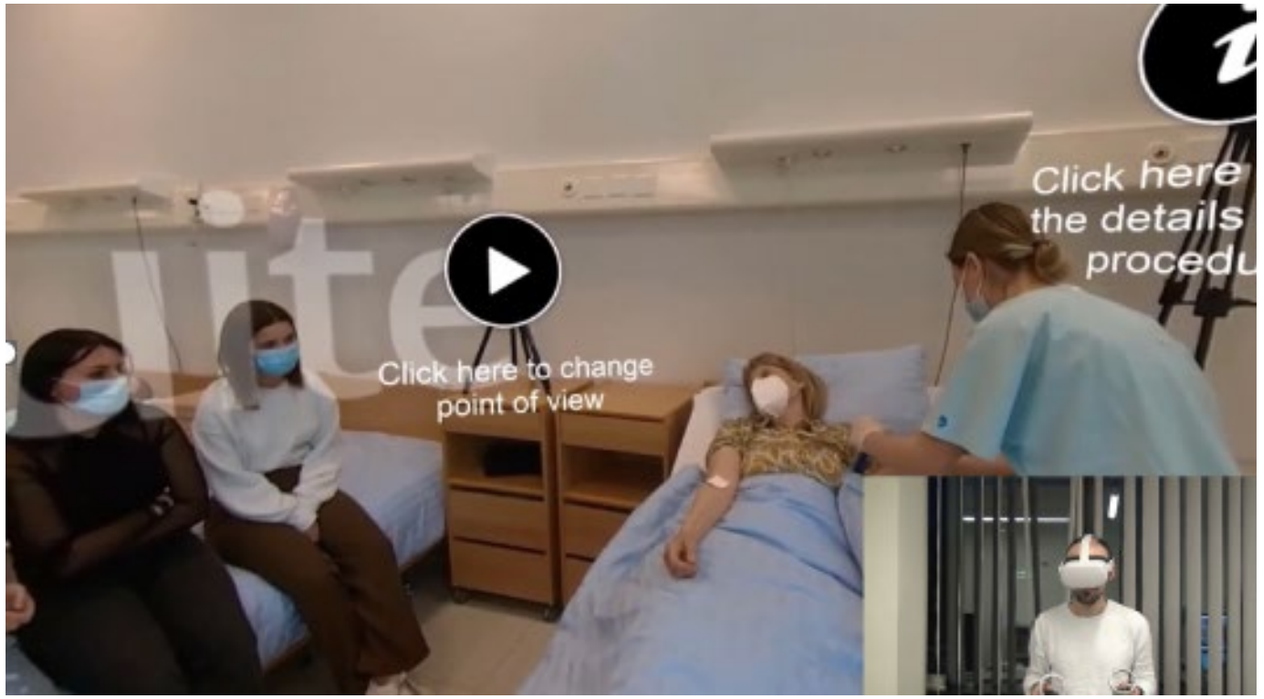
Shaping knowledge through experimentation

Developing designing skills by designing a Virtual Garden



Developing competences on blood sampling through a 360° video

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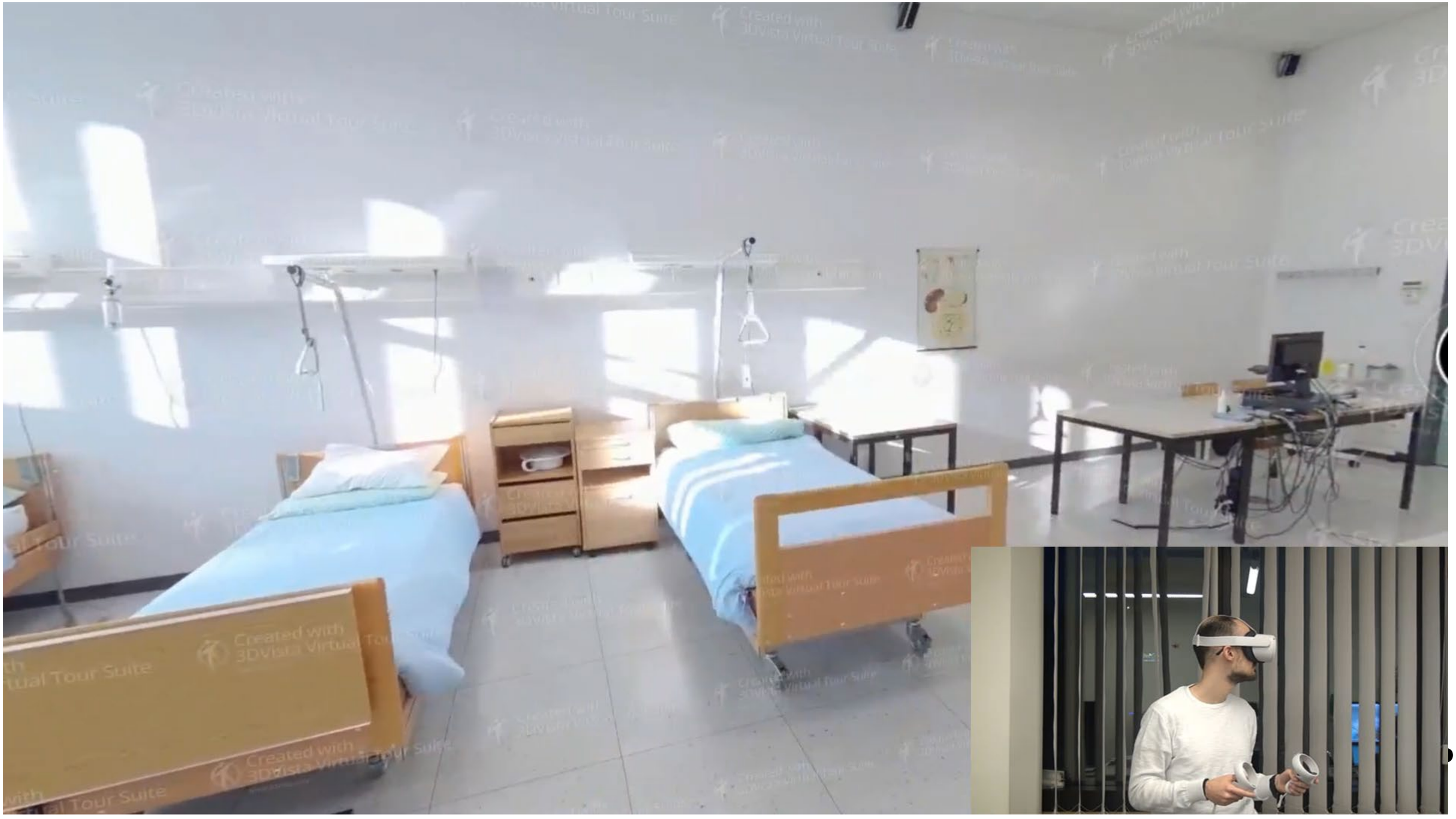
Capture the landscape


Created with 3DVista Virtual Tour Suite

Shifting from experimentation to concrete experience

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Dual-T
Project 3

Technologies for Vocational Training

Leading House funded by the
Swiss Federal Office for
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Solutions brought by XR technologies

- Research shows XR solutions are effective on learning (cognitive, metacognitive and affective aspects)
- offer positive effects on motivation, engagement, and interest.
- AR saves time and costs in procedural learning and allows for constant feedback at the workplace.
- They facilitate learning for apprentices with disabilities and support the development of functional skills.
- VR enables learning in inaccessible or dangerous environments.
- 360-degree videos provide immersive experiences without programming skills and are cost-effective.

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Limitations and Overcoming Challenges

- Adopting XR technologies requires infrastructure and human resources.
- **Strong pedagogical rationale and design** are crucial for beneficial learning effects.
- Promote projects that allow teachers and trainers to create AR/VR experiences **without programming skills.**
- Utilize existing AR/VR applications and partner with research centers for implementation in apprenticeship programs and benefit from infrastructure

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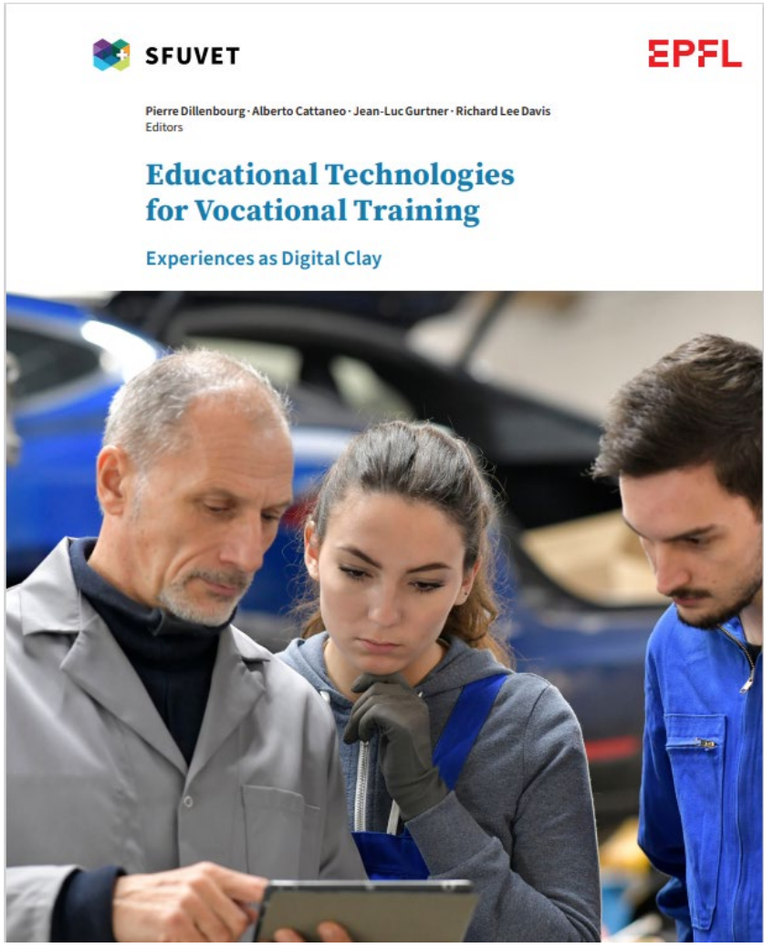
More on SFUVET's activities



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THANK YOU !

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