



Digitalization in TVET



## The Learning Factory

Submitted by Fagskolen Innlandet, Norway

**BILT Innovation and Learning Practice**

In view of the increasing prominence of digital skills and use of technology in work and daily life, it is crucial to meet modern digital skills requirements and to reflect the latest technological evolutions in TVET training. As a response, Fagskolen Innlandet TVET School in Norway works closely with regional industry to provide opportunities for TVET students to develop their skills and use modern technology in training. One such example is their partnership with the Manufacturing Technology Norwegian Catapult Centre (MTNC). Thanks to this collaboration, TVET students have access to several mini factories at Raufoss Industrial Park which serve as Learning Factories. This partnership allows the use of the world's most modern technological equipment for the training of Fagskolen Innlandet's students at a Learning Factory.

- Start date: Autumn 2019
- Type of implementing institution: Private - Public
- Target groups: TVET students, adults in company-based VET, SMEs, and large companies across industries

## Fagskolen Innlandet, Norway

Fagskolen Innlandet is an innovative TVET school in Gjøvik, Norway, which works in close collaboration with the UNEVOC centre Oslo Metropolitan University (OsloMet). Fagskolen Innlandet's goal is to become Norway's most forward-looking TVET school, ensuring it develops sustainable competencies and provides technology education for the future.

## Description of activities

Working collaboratively with local industry, Fagskolen Innlandet TVET school in Norway provides training for students in especially designed spaces called a 'Learning Factory'. These spaces provide the opportunity to apply theoretical knowledge gained in the classroom and practise skills needed in the workplace. The Learning Factory is equipped with state-of-the-art equipment and the latest technological evolutions, allowing students to perform workplace tasks in a safe environment. For example, 'crisis' situations can be simulated where student responses, including mistakes, are managed safely. These scenarios can be adapted and manipulated based on given issues and needs, and the students get to experience a situation close to reality. The concept implies a new structure for learning at different learning venues and new ways of cooperation between the school and the private sector. Besides improving TVET training, Learning Factories help to develop and test new production technologies and new working methods.

This opportunity for TVET students is possible thanks to a collaboration with the Manufacturing Technology Norwegian Catapult Centre (MTNC) to provide the physical space for the Learning Factory, which was developed into a world-class technology centre built to industry 4.0 standards. MTNC has two main areas of enabling technology: Advanced Production Processes, and Digitization/Industry 4.0. MTNC is one of eight such centres in Norway, each addressing a different type of industry. MTNC is financed by both public and private sector contributions. In the Learning Factory, some of the equipment is financed by private companies at a substantial discount, for example Siemens and Intek.

## Added value

### What current challenges does your initiative address?

Fagskolen Innlandet is aware of the digital industrial shift with implications on most businesses: technology,

digitalization and artificial intelligence, often referred to as Industry 4.0, will change the way future professional engineers will work. In turn, this will have implications for content and learning tasks in TVET schools. Fagskolen Innlandet wants to be at the forefront when it comes to offering students training in the latest technology to meet modern skills requirements. To do this, it is important to work closely with industry and relevant companies in the region to bridge the gap between industry and TVET.

### Why is this initiative a success?

While this is a promising initiative for the TVET school to align its classes with real industry demands, it is still at an early stage and results are limited. Since inception, much interest has been generated among SMEs in accessing modern machines and equipment to develop products and production processes, without having to invest in capital and equipment themselves.

### What is the added value of this example?

A Learning Factory is a whole new concept for a TVET school. It is not about 'assembly line students', but about a teaching system that is based on a real industrial situation with most modern equipment in a simulated factory. Importantly, this allows students to learn theory, and then implement it and fully grasp the concept in the Learning Factory, before then moving to real work environment.

## Impact on curricula

### What implications does this example have for current or future curricula?

The Learning Factory content and organization follows the Norwegian national curriculum. It improves the alignment of the school syllabus with the newest trends in technology and industry demands.

### How does this example impact TVET systems?

The primary impact is at the local level of TVET providers. The Learning Factories provide the opportunity for students to practise different situations, which are directly linked to the theoretical knowledge provided by TVET schools, as prescribed by curricula.

### How does this example respond to industry and social demands?

By building a physical factory that includes the entire production process using modern equipment from the workplace, students can implement theory in practice

and gain holistic insights to their learning. Students can test processes and see how individual elements affect another, and analyse, reflect, and apply their learned theory. In this way, students are well prepared to face real challenges when they start to work for industry. This benefits industry as their new employees are familiar with the modern equipment and processes, which means less investment needed for training and upskilling for their particular sector.

## Transferability

### Which components of this practice may have practical value to other UNEVOC Centres/TVET institutions?

Physical learning environments equipped with technology used in the workplace could be an inspiration for other small-scale versions of a Learning Factory. As the equipment is sector-specific, it has a wide appeal for collaboration between TVET institutions and the private sector.

### What challenges do you see if transferred to another context?

A key challenge was ensuring meaningful collaboration between a range of public and private sector entities. Because of the need to physically build the Learning Factory and equip it with modern equipment, access to finance may be a challenge, as well as the access to technology and the possibility to utilize it safely and correctly.

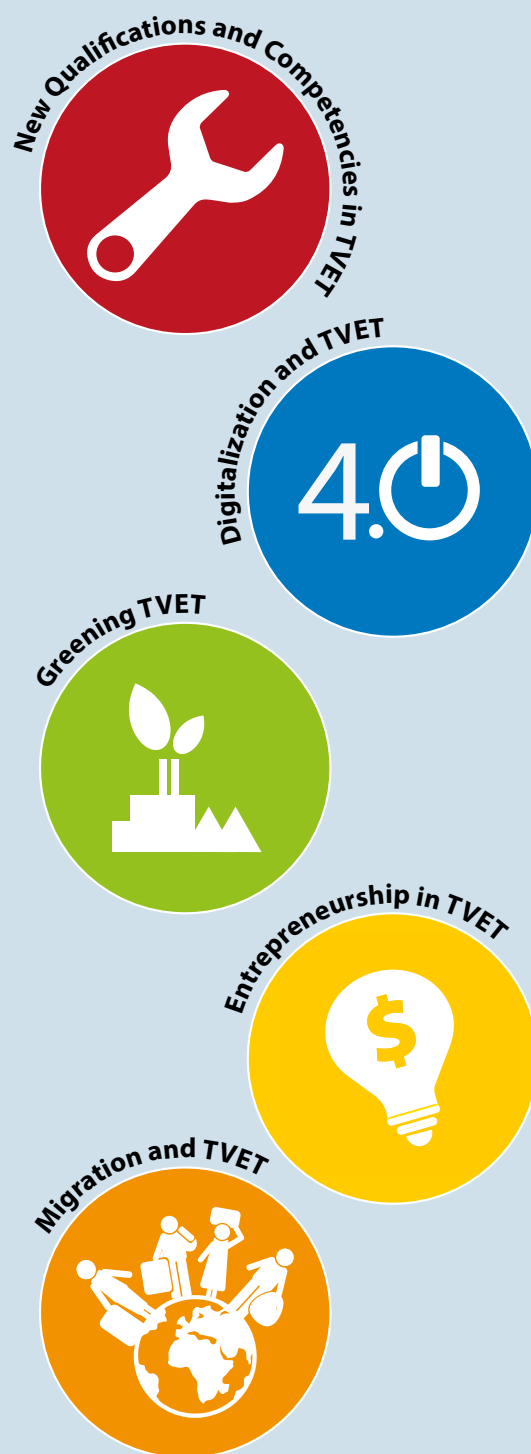
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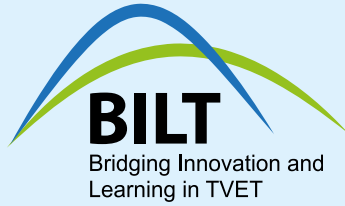
- For more information about this practice:  
[www.fagskolen-innlandet.no](http://www.fagskolen-innlandet.no)  
[www.mtnc.no/](http://www.mtnc.no/)

*Part of the BILT project involves collecting Innovation and Learning Practices\* that address systemic challenges within the five work streams of the project, with the purpose to understand what elements lead to their success and can be transferrable to other contexts.*

Access more BILT Innovation and Learning practices in the thematic areas of:



\*UNESCO-UNEVOC does not endorse any of the practices included in this database and is not responsible for their management or implementation.



The Bridging Innovation and Learning in TVET (BILT) project provides TVET stakeholders with a platform for exchange and supports them to address current challenges in TVET systems, which arise due to technological, social, environmental, and workplace changes.

Within BILT, the overarching thematic area is New Qualifications and Competencies in TVET, which is supported by four work streams:

- Digitalization and TVET,
- Greening TVET,
- Entrepreneurship in TVET, and
- Migration and TVET.

Through regular knowledge exchange, thematic project activities, and expert working groups, BILT offers opportunities for collaboration between UNEVOC Centres and TVET stakeholders in Europe, and a platform for bridging of innovation and learning between European UNEVOC Centers and TVET stakeholders in the Asia-Pacific and Africa regions.

The results of ongoing activities are accessible on BILT's web page and will be disseminated during a BILT Learning Forum.

The BILT project is carried out in collaboration with UNEVOC Network members, coordinated by UNESCO-UNEVOC with support of the German Federal Institute for Vocational Education and Training (BIBB), and sponsored by the German Federal Ministry of Education and Research (BMBF).

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