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## FabLab

Submitted by Verket FabLab, Norway

**BILT Innovation and Learning Practice**

Digitalization in TVET

4.0

In today's world, TVET students need to be equipped with modern skills in the fields of innovation, technology, entrepreneurship and digitalization. However, access to modern technology to provide practical learning experiences can be challenging. To address this, the global FabLab network offers small-scale workshops with the newest technological equipment available to use by individuals and industry. FabLabs allow testing of equipment or creating of products without the cost of investing in technology. In Norway, the Verket FabLab is one example of how a FabLab can successfully be implemented thanks to the close cooperation between the private sector, Østfold county, and TVET providers.

- Start date: 2016
- Type of implementing institution: Private and public collaboration
- Target groups: TVET providers, private individuals, industry, and the private sector

## Verket FabLab, Norway

The Verket FabLab was established in 2016 and is a cooperation between the local private sector, Østfold county, and TVET providers. It is privately owned but is accessible for the public through membership. TVET students are able to access the site and utilize the technology to gain practical learning experiences before they enter the workforce.

## Description of activities

A fabrication laboratory, or 'FabLab', is a small-scale learning and production space that offers access to modern technology and where experts can instruct learners in its use. Typically, a FabLab allows students the opportunity to practise on equipment that may normally be difficult to get access to, or for industry and entrepreneurs to build, prototype, and test their products on a very small scale without the need for large investments in technology.

The Verket FabLab in Moss, Norway, was established in 2016. Being in private ownership, it is one of five approved FabLabs in Norway. It offers the above described services to its members for commercial customer projects and education and training purposes. In 2019, the Verket FabLab saw around 200 users. Its goal is to build a multidisciplinary environment, with people of all ages and backgrounds - to foster creativity and facilitate the exchange of knowledge. Moreover, the intention is to offer a useful tool for idea and product realization targeting both industry and individuals. As for the latter, TVET students who are trained in technology-related professions greatly benefit from the FabLab, as it allows to create their own products with modern equipment.

In addition to the regular operation of the FabLab, a 'Fab Academy' has been started. It is a part-time study programme over a six-month period. Thanks to this practical learning experience, students learn to make a prototype or product using digital fabrication tools and methodologies. Additionally, students can watch and participate in global lectures that are available online. Two to three times a week the students have access to the FabLab itself, with the necessary materials and machines. In the framework of the Fab Academy, they receive personal guidance for their individual project. Finally, participating students are part of a global FabLab and Fab Academy network

and can communicate with fellow students around the world.

## Added value

### What current challenges does your initiative address?

FabLabs are a response to the need of TVET students to acquire innovative, technological, entrepreneurial and digital skills.

### Why is this initiative a success?

The Verket FabLab has been a success because of the support of local government funding, and close collaboration with schools and training institutions. This support was instrumental in allowing the initiative to grow and develop into a facility that can offer not only educational opportunities, but opportunities for local companies to utilize the services it provides in order to increase their competitiveness. It has also been a success because of the variety of the provided services that are beneficial for companies of different sizes.

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

FabLab is a working example of how to provide access to modern technology while fostering innovative, technological, entrepreneurial and digital skills in students. Importantly, this example has succeeded in a smaller city where traditionally there has been lower levels of economic activity or industrial output and where less resources have been made available for students.

## Impact on curricula

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

The learning content and training methodologies could be integrated in future curricula.

### How does this example impact TVET systems?

The impact of this example is on a local level, as students attending TVET institutions in Moss can benefit from the Verket FabLab.

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

Allowing TVET students access to, and use of advanced technology and equipment is beneficial to industry that has to provide less training to new employees, and also to the students who learn new

skills and practise with modern technology prior to entering the workforce.

## Transferability

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

The FabLab concept could be an inspiration for similar initiatives or for creating a FabLab at other locations and become a member of the global FabLab network.

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

While in principle a FabLab can be established anywhere, and indeed has spread to many cities and countries globally, key considerations include access to finances to setup the FabLab, along with finding a suitable physical space and acquiring the necessary competences for using modern technology. Strong local government, public, and private sector support is also needed to increase the chances of success.

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[www.fabfoundation.org](http://www.fabfoundation.org)

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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