

# Bridging Innovation and Learning in TVET

## Thematic Workshop - Digitalization

OsloMet, Oslo, Norway, 02-03 October 2019  
**Workshop summary**



4.0



**Bridging Innovation and Learning in TVET**

**Thematic Workshop - Digitalization**



**4.0**

The image features a central blue circle containing the text '4.0' and a white power symbol. This circle is connected to a thick blue line that curves upwards and then downwards. Below this, several other thick, curved lines in orange, yellow, red, and green sweep across the bottom of the page, creating a dynamic, abstract graphic design.

This summary captures the key outcomes of the thematic BILT Workshop on 'Digitalization', held at Oslo Metropolitan University (OsloMet) in Oslo, Norway, on 02-03 October 2019.

# Bridging Innovation and Learning in TVET (BILT)

The BILT project is a collaborative initiative focusing on consolidating the European Cluster of the UNEVOC Network. An additional bridging and knowledge exchange component with UNEVOC Centres and TVET stakeholders in the Asia-Pacific

and African regions is initiated in 2020. At its core, BILT addresses TVET challenges in five thematic areas, or 'work streams', that the participating UNEVOC Centres and other TVET stakeholders will focus on. Within BILT, these are:



In addressing these work streams, BILT intends to share information, generate new knowledge, and enhance national and regional TVET capacities in order to provide quality TVET now and going forward. Besides re-energizing the European cluster of the UNEVOC Network, the BILT project seeks to enlarge membership of the cluster through the addition of new active members.

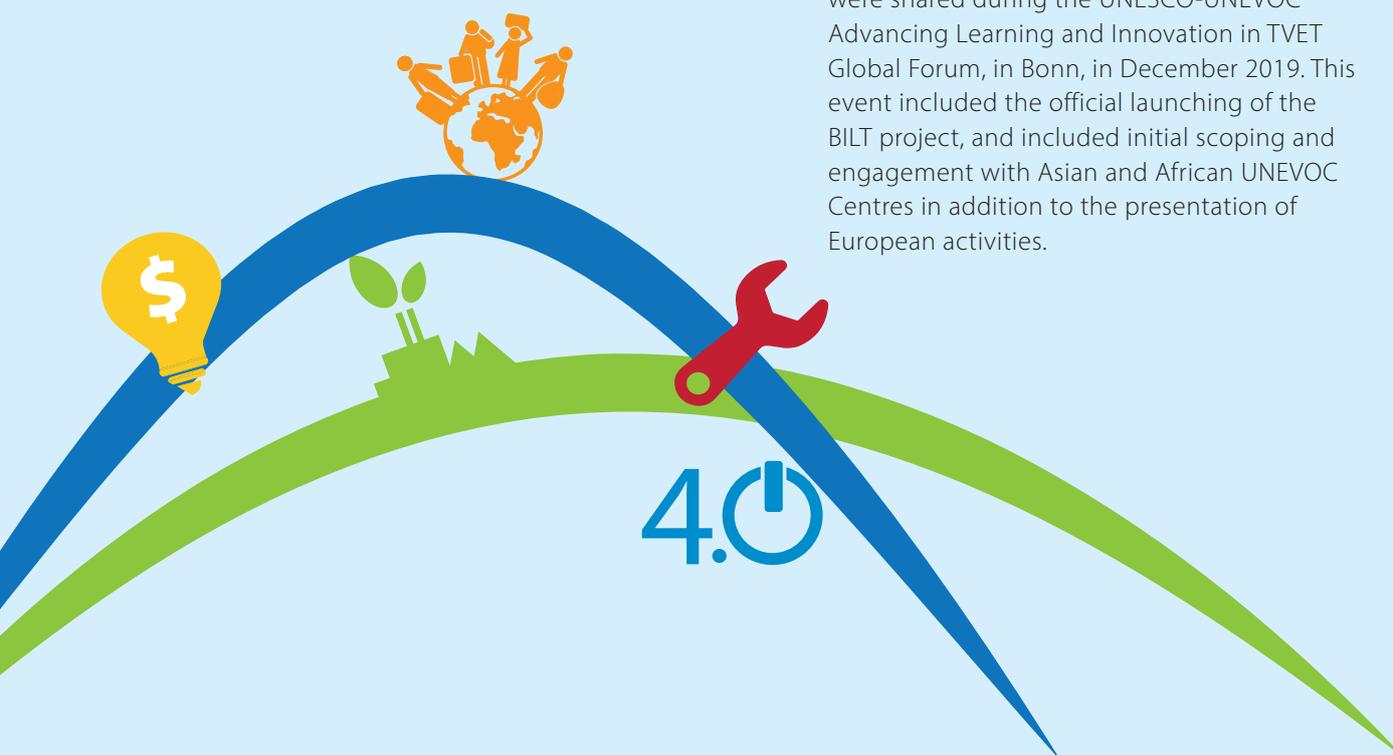
BILT is a collaboration between UNEVOC Network members, coordinated by the UNESCO-UNEVOC International Centre for TVET in Bonn, in partnership with the German Federal Institute for Technical and

Vocational Training (BIBB), and implemented with the financial support of the German Ministry for Education and Research (BMBWF).

The BILT project began with a Kick-Off Conference in July 2019, where European UNEVOC and other TVET stakeholders considered two to three key issues within each BILT work stream. These topics became the framework to be explored in detail between October and December 2019 during a series of thematic workshops, each led by a UNEVOC Centre Focal Point. They were:

Theme	Host	Dates
<b>Digitalization</b>	OsloMet, Norway	2-3 October 2019
<b>Greening TVET</b>	MCAST, Malta	23-24 October 2019
<b>Entrepreneurship and TVET</b>	TKNIKA, Spain	30-31 October 2019
<b>New Qualifications and Competencies</b>	SFIVET, Switzerland	12-13 November 2019
<b>Migration and TVET</b>	University of Nottingham, UK	10-11 December 2019

Interim results of each BILT Thematic Workshop were shared during the UNESCO-UNEVOC Advancing Learning and Innovation in TVET Global Forum, in Bonn, in December 2019. This event included the official launching of the BILT project, and included initial scoping and engagement with Asian and African UNEVOC Centres in addition to the presentation of European activities.



# Thematic Workshop – Digitalization

OsloMet, Oslo, Norway, 02 to 03 October 2019

Digitalization is transforming our economy, society and daily lives as part of a ‘fourth industrial revolution’. Novel and advancing technologies have led to new occupations and substantial changes in the workplace. TVET providers are in the spotlight to offer additional and updated qualifications and competences to students. Worldwide, TVET systems take different approaches to meet this fundamental challenge and adapt training accordingly.

Against the backdrop of these demands, BILT activities in this work stream began with an initial workshop on ‘digitalisation’ in 2019, held at the UNEVOC Centre Oslo Metropolitan University (OsloMet) in Oslo, Norway. This brought together subject matter experts from nine countries (Austria, Estonia, France, Germany, Netherlands, Norway, Portugal, Spain and Switzerland) who attended the event. Each expert contributed an example from their institution or business that addressed a key issue within the topic of digitalization, either **‘Engaging SMEs in the TVET cycle’** or **‘Teacher and trainer training, and teacher-learner interface’**.

The workshop was an occasion to share innovative projects and to discuss key issues in response to the rapid pace of technological change that is affecting current and future jobs. This report illustrates how stakeholders engaged during the workshop to address these challenges and ensure that TVET remains not only relevant now, but positions itself for the future.

## Opening and framing

Representing OsloMet, the Head of Department of Vocational Teacher Education, Ms Inger Lise Holen, delivered opening remarks and welcomed participants, noting that OsloMet as an institution has over sixty years of experience offering TVET programmes for teachers and conducting research on TVET topics: first as a college, and now as a university. Subsequently, the formal opening of the workshop was conducted by Ms Karianne Helland from the Norwegian Ministry of Education and Research, and Mr Morten N. Bakke, representing the Confederation of Norwegian Enterprises. In recognition of the workshop topic, Ms Helland’s opening included the presentation of a newly-developed Norwegian Framework for Teacher’s Digital Competencies. From the perspective of Norwegian private sector, Mr Bakke emphasized that companies frequently experience challenges in hiring employees with the needed digital skills to be successful. He therefore advocated for new flexible education opportunities, including online open learning spaces for initial and continuing TVET.

*Karianne Helland, Norwegian Ministry of Education and Research*





*Morten Bakke, Confederation of Norwegian Enterprises*

Introducing the work stream, Mr Jens Liebe from UNESCO-UNEVOC pointed to the relevance of digitalization in TVET for the Sustainable Development Goals (SDGs), noting how digitalization helps to achieve quality education (SDG 4), has a significant impact on decent work and economic growth (SDG 8), and fosters innovation (SDG 9). In this line, the BILT project supports collaboration activities and thereby partnership for the goals (SDG 17).

With this framework in mind, BILT team member Ms Vera Hark, from the German Federal Institute for Vocational Education and Training (BIBB), familiarized participants with an overview on planned BILT activities as well as the structure of the workshop. The objectives and expected outcomes of the workshop were to:

- Share good practices and innovative solutions for TVET in the field of digitalization with colleagues from across Europe;
- Engage participants in peer-learning activities, via the contribution of institutional experiences and learning from others; and
- Collect information on the examples presented for this theme, enabling their documentation and inclusion as ‘BILT Innovation and Learning Practices’, which will be shared with the TVET community.



*Jens Liebe, UNESCO-UNEVOC*

With these goals in mind, UNESCO-UNEVOC’s position on digitalization and TVET within UNESCO’s ‘ICT in education strategy’ was confirmed by Mr Max Ehlers, UNESCO-UNEVOC staff member. Trends identified included UNESCO’s activities in the area focusing on Artificial Intelligence as an opportunity to accelerate the achievement of SDGs, while keeping in mind the potential risks for equity and access to learning.

The opening session was concluded via remarks from the workshop host, Professor Ronny Sannerud, who explored the clarification of the concept and application of digitalization and TVET from the Norwegian perspective. In Norway, the most frequently discussed topics concerning digitalization include advanced manufacturing, disruptive technologies, use of big data, the internet of things, and cyber-physical systems. TVET’s response to these

challenges and opportunities should involve close collaboration with industry for development and implementation of curriculum, and for defining specific training content as well as the development of digital learning and teaching environments by TVET providers. Professor Sannerud's concluding remarks drew a close connection between digitalization and sustainability – a connection which is also captured by the Norwegian white paper (2016-2017) on a greener, smarter and more innovative industry.

### Workshop discussion format

For this work stream, UNEVOC Centres jointly identified two defining key issues which would structure the workshop:

- Key issue 1: Small and medium enterprises (SME) and engaging them in the TVET cycle
- Key issue 2: Teacher and trainer training, and teacher-learner interface

In preparation of the workshop, the BILT project team collected practical examples from European UNEVOC Centres and other TVET stakeholders within the digitalization work stream. These 'BILT Innovation and Learning Practices' would form the core of presentation and discussions during the event.

For both key issues, a framing presentation included an overview of challenges whilst also providing information on recent developments and trends. This allowed participants the opportunity to understand the context of the 'BILT Innovation and Learning Practices'. Following this, participants presented examples in short 'pitches', designed to present a high-level overview of the example. In order to fully engage participants, the workshop proceeded in a World Café format where each example was given one hour to discuss three main questions:

- What is the added value?
- What is the impact on curricula and training regulations?
- Which elements could be transferable to other contexts?



*Ronny Sannerud, OsloMet*



*Unai Ziarsolo, TKNKA*

In this way, participants gained a deeper understanding of the presented projects and approaches towards digitalization.

Further group discussion following the World Café allowed participants to jointly identify common and exceptional elements from each example, and provided avenues for future exploration for the BILT project.

## Key Issues

### BILT Innovation and Learning Practices

Initial framing of the key issues affecting digitalization was delivered by Professor Sannerud from OsloMet. Regarding the first **'key issue, SMEs and engaging them in the TVET Cycle'**, Mr Sannerud emphasized that a pre-condition to involve and engage SMEs in the TVET cycle is that TVET stakeholders are aware of the challenges faced by companies regarding, for instance, the need for training on digital tools. The development of methods to help analyse work and production processes is thus necessary to understand and address training needs. This, in turn, works towards a common understanding of TVET stakeholders and SMEs of possible responses to digitalization and training.

Importantly, representation from Norwegian private sector also reinforced the need for close engagement between industry and educational institutions. Mr Bjørn Paulsrud, CEO at Norwegian Viken Technology Cluster 4.0, noted how industry and educational stakeholders 'speak different languages', and that successful cooperation requires a bridge to act as a transfer of knowledge between those stakeholders. An example he provided was the mapping of digital competencies of SMEs, something not able to be achieved easily in isolation. Mr Paulsrud further outlined how questionnaires on the requirement on digital competencies developed by academic institutions were not useful for industry – a mismatch that requires better coordination.

With the framing complete for 'SMEs and engaging them in the TVET Cycle', five 'BILT Innovation and Learning Practices' were presented and each was discussed in a World Café format. In addition to the summaries of the examples in this report, more detailed information as well as further material on each example is accessible via the BILT knowledge platform.

#### Learning Factory

**Presented by Mr Frank Jørgen Vangen, Fagskolen Innlandet, Norway**

The Learning Factory is located in Raufoss Industrial Park, where TVET students attend training in Mechanical Engineering and Industrial Production. It is a collaboration between the private and public sectors, and allows TVET students to access both upper secondary school and the real industry. The Learning Factory offers the most modern technological equipment for learning and thereby enables students to follow-up on the latest technological trends and skills required of tomorrow's workforce. This allows students to learn and experiment in a safe environment, learning from mistakes. Altogether, the Learning Factory links working life as a central learning arena with education.

#### Catapult Centres

**Presented by Ms Mette Foss Dalseg, Norwegian Catapult Centre (MTNC), Norway**

The Norwegian Catapult Centre (MTNC) will be developed into a world-class technology centre, where several mini-factories with Industry 4.0 standards will be built to develop and test new production technologies and new working methods. The centre will be a new and important learning arena for both large and small companies, across industries, across the country. MTNC has two main areas of enabling technology: Advanced Production Processes and Digitization / Industry 4.0. MTNC Raufoss is one of eight centres in different types of industries. For example, there are centres for seafood and material technology.

**Campus des Métiers****Presented by Mr Laurent Renaux,  
TechnoCentre HenriFabre, France**

The 'Campus des Métiers' is a cluster developing professions and qualifications for the industry of the future. It has developed a modular training programme in 'Numerical Engineering', which covers the 'life cycle' of digital models, their link with reality and the continuity of digital data. The aim of the one-year extra training course is to foster collaborative work and skills which are expected by business and the industrial sector. Concrete results are the creation of a training plan for trainers as well as the implementation of technical platform equipment (work stations, metallic 3D printers, collaborative platforms, digitalisation arms etc.). As the acquired skills correspond to business and industry demands, the trained technicians in digital engineering are 'directly employable'.

**SIM Project – 4.0 Smart Monitoring Systems for SMEs****Presented by Ms Margarida Segard,  
ISQ Academy, Portugal**

The SIM Project tackles the challenge of SMEs not being aware of Industry 4.0 advantages for their business. ISQ Academy uses proprietary tools, such as SHIFT or Enduce, to help SMEs to get critical answers to the following questions: Do you know what the Industry 4.0 transformation entails?

What are the advantages of this transformation and digitalization for business? What is your business' Industry 4.0 maturity level? What can you do to improve this level and become more competitive/a growing business? Furthermore, the project offers the creation of Industry 4.0 development plans as well as coaching for business transformation and new training programmes for staff.

**EXAM 4.0 – Excellent Advanced Manufacturing****Presented by Mr Unai Ziarsolo, UNEVOC  
Centre TKNIKA, Basque Country/Spain**

In an era where digitalization is constantly changing the competences required in industrial production processes, TVET programmes must adapt and offer updated training. Students in Advanced Manufacturing (AM) do not only need specific technical competences, but must also get used to digital learning and working environments. In this context, EXAM 4.0 offers a '4.0 workflow' that tackles both technical and methodological aspects related to AM. The project targets TVET providers that offer AM programmes as well as SMEs where this technology can be implemented. At this point, there is a digitalized 2000 square metres shop floor running at the Miguel Altuna HVET centre. Three further centres are being implemented at other locations in the Basque Country. One of the aims of EXAM 4.0 is to spread the idea to other TVET centres within Europe.

Day two of the workshop saw the focus switch to the second key issue of **‘Teacher and trainer training, and teacher-learner interface’**.

Mr Sannerud’s framing included how keeping education up-to-date is especially relevant when it comes to digitalization. In this context, OsloMet highlighted their focus on further and continuing education for TVET teachers concerning new technology. This, for example, provides digital learning tools in classrooms in addition to developing learning tasks or educational programmes to complement and increase digital literacy and technology-related knowledge.

Continuing this theme, Ms Vera Hark from the BIBB, Germany, detailed the approach of an ‘International Roadshow: Digital Media in VET’. This didactic concept enables successful training projects and pilot initiatives promoting digital learning tools to be tested and used by TVET stakeholders ‘on the spot’. This dissemination method promotes their utility for TVET training as a learning tool. Ms Hark suggested to realize this format in the framework of the BILT project activities on a European and global scale.

Following the framing component to the second key issue, six further ‘BILT Innovation and Learning Practices’ were pitched and discussed through a World Café format. As for the above, and in addition

to the summaries of the examples in this report, more detailed information as well as further material (if available) on each example is accessible via the BILT knowledge platform.

### **MOVE 21 – 21st Century Skills** **Presented by Mr Ronald Ferket,** **UNEVOC Centre CINOP, Netherlands**

This project seeks to map ‘21st century skills’ (for example IT-skills, digital media skills or entrepreneurial skills) of TVET students by using data science. In a second step, the data is used to create different student profiles (18 different profiles were found, 8 common to each participating TVET school) and to assess the effect of educational activities related to 21st century skills. The core question of the project is thus: What is the effect of educational activities on 21st century skills, depending on different student profiles? The project’s purpose is to gain insights into the development of 21st century skills, which are crucial both for TVET students as active citizens assuming responsibility in society, as well as for future employers who need employees with relevant skills.

*BILT workshop participants discuss a project example during the World Café session*



### **Situation-based Vocational Education with Virtual Reality**

**Presented by Mr Martin Dobricki,  
UNEVOC Centre SFIVET, Switzerland**

This project investigates the usefulness of immersive Virtual Reality technology for situation-based education of TVET students and trainees. More precisely, it examines the usefulness of immersive Virtual Reality for horticultural teachers to train their students' skills in garden planning. This practice can help teachers to connect or merge the school-based education of their students with the work life for which they are, or will be trained. Thereby, it serves to tackle the challenge to better align vocational education and training with the ongoing digital transformation of work life by digital technologies and their use. Making situation-based education more effective and efficient this kind of practice may moreover shorten the time a curriculum will take.

### **LEGO Education Center for Vocational Teacher Education**

**Presented by Mr Birger Brevik,  
UNEVOC Centre OsloMet, Norway**

The project aims to simulate tasks such as automatized processes and robots in working life with LEGO Mindstorms as a learning tool in TVET schools. It provides opportunities for practical training in STEM, digitalization and robotization for young students and adults. LEGO Mindstorms uses industry-standard sensors and software. It helps industry to reach apprentices who will experience such standards and principles.

### **Industry 4.0 Challenge – Apprentice Competition**

**Presented by Ms Johannah Bachmair,  
ibw, Austria**

This project is a team competition for TVET apprentices from age 15 onwards and for all occupations. Teams consist of apprentices who work for different companies. The competition targets specific learning outcomes. Its focus does not only lie on technical skills but also on soft skills, such as communication and inter-professional cooperation. An example of a task performed during the competition would be to generate a QR Code or to work with an industrial robot.

### **VET 4.0: Digitalization in the Austrian VET System**

**Presented by Mr Christian Schrack,  
BMBWF, Austria**

This initiative aims to prepare TVET schools for the challenges related to Industry 4.0 and Artificial Intelligence by creating a basic strategy for all Austrian TVET schools, including dual and academic TVET in several sectors. The core questions are: How to prepare young people in IVET for the professional and social challenges of digitalization, Industry 4.0 and AI? How to prepare teachers and trainers? Within the scope of the initiative, a peer learning TVET 4.0 congress for teachers and trainers takes places, where they collaboratively work on ways to improve the participation of their schools or businesses in the 4.0 transformation. Additionally, students/trainees work on these challenges in cooperation with companies, especially in the framework of their final exams ('diploma work').

## **EQF (European Qualification Framework) Robot Operator/Robot Technician**

**Presented by Ms Anu Moosel,  
UNEVOC Centre Foundation Innove, Estonia**

In Estonia, new Occupational Qualification Standards were developed for two profiles: Robot Operator (EQF Level 4) and Robot Technician (EQF level 4). These were completed and introduced in the beginning of 2018. In the same year, occupational standards-based curricula for these occupations were developed and implemented. The project's target group are the following sectors: mechanical engineering, chemical industry, food processing industry and logistics. The link between EQF, occupational standards, curricula and qualification certificates makes the Estonian TVET system transparent and sustainable. In spring 2019, the first twelve Robot Technician Occupational Qualification Certificates were awarded and this process is evolving.

A representative from Kyambogo University Centre for Vocational Pedagogy and Lifelong Learning in Uganda – partner institute of OsloMet and an African UNEVOC Centre – participated via Video Conference as a passive observer to the presentation of the above listed 'BILT Innovation and Learning Practices'. Thereby, OsloMet initiated a first step towards the BILT Bridging process which will establish an interaction between the European Cluster of the UNEVOC Network and African as well as Asian partners. 30 people at the University of Gothenburg in Sweden participated online, including representatives from academia and the Swedish automotive sector.

*Group work during a World Café Session*



# Findings

## Digitalization trends and opportunities

Digitalization is a broad term, covering multiple dimensions of a complex concept. Besides its relation to notions such as 'Industry 4.0', 'Industry for the future' or 'VET 4.0', it points to modern technological evolutions with a strong influence on the quantity and quality of jobs and TVET in general. Related topics include jobs and occupations at risk, potential new jobs, and technologies that change the nature of jobs in different occupations and at different levels. Consequently, students need to be prepared for the future world of work with adequate new qualifications and competencies that need to be addressed in education and training. Enabling teachers and (in-company) trainers to make use of the concepts and benefits of digitalization through the right knowledge, methodology and didactic approaches is another critical point. During the BILT workshop, consensus was found on the necessity of addressing digitalization trends and opportunities in the 21st Century in an international context. The BILT knowledge platform, gathering 'BILT Innovation and Learning Practices' and illustrating the cooperation between UNEVOC Centres, contributes to the demand for innovative practices in digitalization.

*Mr. Paulsrud, VIKEN cluster, Norway*



### KEY ISSUE 1 SMEs and engaging them in the TVET cycle

Regarding the first key issue, workshop participants drew special attention to the need of establishing strong linkages and building trust between the private sector and TVET institutions. Numerous participants mentioned the improvement of **stakeholder partnerships as key to success** for their projects or approaches – a point reinforced from the business side by the Viken Technology Cluster 4.0. The discussions underlined the interdependency of industry and TVET institutions: on the supply side, TVET institutions prepare professionals with relevant skills through modernized training; on the demand side, the private sector informs TVET institutions of the latest developments in terms of skills needs.

A noteworthy example discussed in this context is the preparation of questionnaires which investigate the skills requirements that SMEs expect from future employees. These questionnaires should address the concerns of end-users – asking the right questions could prompt industry to consider digitalization benefits and skills considerations in ways they had not previously considered. This aligns with evidence indicating that **SMEs can have difficulty in knowing or expressing their training and skills needs relating to digitalization**. Also, reluctance in adopting new technology can be a combination of not-understanding the benefits in addition to considerations such as cost or ease of adoption. Potential solutions could involve closer collaboration between TVET (research) institutions and SMEs that cooperate on understanding and addressing digitalization trends and opportunities, whilst simultaneously exploring overcoming the reluctance of adopting digitalization in TVET and the workplace.

A critical topic that participants drew attention to was the **often occurring lack of financial resources of TVET institutions to buy modern equipment**, particularly in school-based learning.

TVET institutions could therefore seek to create stronger partnerships with companies to finance digital tools for training, with industry and students benefitting from familiarity with particular items of machinery or technology prior to entering the workforce. Participants agreed that if private financial resources are invested into projects and training programmes, the goals and activities must be relevant and of interest for the private sector to commit and participate in.

## KEY ISSUE 2

### Teacher and trainer training, and teacher-learner interface

When it comes to the second key issue, participants emphasized that digitalization in TVET does not only concern ICT but every other aspect of digitalized working life. In this way they focused on different trends within the ‘teacher-learning interface’: On the one hand, students and trainees should have the opportunity to use **digital learning tools as a training method** to facilitate the learning process – for example through applications for digital gadgets or e-learning content. On the other hand, digital tools should serve to **train students’ and trainees’ digital literacy and mind-set**, necessary for tomorrow’s world of work. When, for instance, students have access to a fictional garden with VR glasses, as in the ‘BILT Innovation and Learning Practice’ presented by the UNEVOC Centre Swiss Federal Institute for Vocational Education and Training (SFIVET), this does not only increase their skills in gardening, but will also help to understand and handle digital tools they might need to use in modern service. Additionally, students/trainees might thereby be motivated to suggest such tools to future employers or to integrate them into the working process of their own company if they become entrepreneurs.

Participants regarded regular **capacity building of teachers and trainers as a critical point**, where much improvement can be achieved. Teachers and trainers are often not qualified to effectively train their students and trainees according to newest digital developments. Reasons for this vary, but include the lack of updated teaching content and limited exposure to new equipment which supports teachers and trainers in their practice.

### Integrating digital competencies into curricula and training regulations

How can digital competencies be integrated into curricula and training regulations was one of the three main focus questions for the World Café sessions. The **identification of new digital competencies seems less challenging than the way to introduce these into curricula** and especially training methods. This question is closely connected to the above-mentioned challenge of teacher and trainer digital skill training enabling the knowledge transfer to students and trainees. Some solutions to this challenge were given through the ‘BILT Innovation and Learning Practice’, for example the Learning Factories presented by the UNEVOC Centre OsloMet which offer hands-on learning approaches for digital tasks.

**A specific challenge posed by digitalization is the speed of new developments.** In ever faster cycles of innovation, curricula and training regulations need to be understood as well as quickly and pro-actively updated, as presented in the ‘Campus des Métiers’ example, which works on the development of additional tracks for TVET students or professionals who need new skills for digital working environments. Alternatively, **curricula and training regulations might be kept flexible enough for different types of training institutions to fill them with relevant content** and the degree of digital competencies they are able or willing to teach. The examples presented and discussed covered a range of flexibility in terms of following national guidelines, with variation seen including very structured curricula that allows little movement, to more locally-driven content that is allowed under a less-restrictive national framework.

Finally, an example that received a lot of attention with regards to flexible or individual curricula and training regulations was the ‘MOVE 21’ project, conducted by the Dutch UNEVOC Centre, CINOP. The MOVE 21 project team created student profiles on 21st century skills with the help of analysing big digital data trends amongst self-participating students. In a second step, the created profiles were used to help TVET students adjust curricula to their specific needs: students had the option to access to ‘open’ vs ‘closed’ learning routes according to their profile.

## BILT peer learning

Participants underlined the **importance of further collaboration within the BILT project process** through sharing experiences and maintaining a content-driven discussion. Concrete activities such as sharing information as well as presenting innovative approaches to each other were wished for. Content-wise, participants proposed to investigate common traits which connect the different BILT project work streams – such as the achievement of greening processes through digitalization. A first step towards this goal was reached through the work stream on ‘New qualifications and competencies’ and the corresponding BILT workshop at the UNEVOC Centre SFIVET in November 2019.

*Group work during a World Café Session*



## List of Participants

Name	Institution	Country
Johanna Bachmair	IBW	Austria
Morten N. Bakke	The Confederation of Norwegian Enterprise	Norway
Birger Brevik	OsloMet	Norway
Tristan Cole	UNESCO-UNEVOC	Germany
Martin Dobricki	SFIVET	Switzerland
Max Ehlers	UNESCO-UNEVOC	Germany
Ronald Ferket	CINOP	Netherlands
Vera Hark	BIBB	Germany
Karianne Helland	Norwegian Ministry of Education and Research	Norway
Inger Lise Holen	OsloMet	Norway
Jens Liebe	UNESCO-UNEVOC	Germany
Matthieu Merciecca	French Ministry of Education	France
Anu Moosel	Foundation Innove	Estonia
Aitor Otaño	TKNIKA	Spain
Hans Bjørn Paulsrud	Viken Technology Cluster 4.0	Norway
Laurent Renaux	Technocentre Henri Fabre	France
Ronny Sannerud	OsloMet	Norway
Christian Schrack	BMBWF	Austria
Margarida Segard	ISQ Academy	Portugal
Frank Jørgen Vangen	Fagskolen Innlandet	Norway
Unai Ziarsolo	TKNIKA	Spain

Participants from the BILT Digitalization workshop at OsloMet, Oslo, Norway



# Workshop Agenda

2 October	Wednesday
08:30–09:00	<b>Registration and welcome coffee</b>
09:00–09:45	<b>Welcome and opening</b> Inger Lise Holen, Head of the Department of Vocational Teacher Education, OsloMet Jens Liebe, Senior Programme Expert, UNESCO-UNEVOC Karianne Helland, Senior Advisor, Norwegian Directorate for Education and Training, Norwegian Ministry of Education and Research Morten N. Bakke, Head of Business Policy, The Confederation of Norwegian Enterprise  <i>Introduction of the participants, Group Picture</i>
09:45–10:30	<b>Framing the workshop</b> Overview of the BILT project, objectives and expected outcomes of the workshop and workshop structure  <ul style="list-style-type: none"> <li>• <b>Digitalization workshop within BILT</b>                Jens Liebe, Senior Programme Expert, UNESCO-UNEVOC                Vera Hark, Project Manager/Technical Advisor, BIBB</li> <li>• <b>Defining digitalization</b> <ul style="list-style-type: none"> <li>• Digitalization within UNESCO's Strategy for TVET and Programmes                    Max Ehlers, Associate Officer IT, UNESCO-UNEVOC</li> <li>• Clarifying Digitalization (concept, application)                    Ronny Sannerud, Professor, OsloMet</li> </ul> </li> </ul> Input from the audience
10:30–10:45	<b>Coffee break</b>
10:45–11:30	<b>Topic 1: SMEs and engaging them in the VET cycle</b> Overview of the key challenges & market demands from the Norwegian context  <ul style="list-style-type: none"> <li>• <b>Use of analytical tools to identify industry needs for digital skills</b>                Arne Ronny Sannerud, Professor, OsloMet</li> <li>• <b>Viken technology cluster 4.0 &amp; Viken young</b>                Hans Bjørn Paulsrud, CEO Viken technology cluster 4.0</li> </ul>

<b>2 October</b>		<b>Wednesday</b>	
<b>11:30–12:30</b>	<b>Peer learning via practical examples in ‘SMEs and engaging them in the VET cycle’</b> Session I – presentation of practical examples		
	<ol style="list-style-type: none"> <li><b>1. Learning Factory</b> Frank Jørgen Vangen, Learning factory, Norway</li> <li><b>2. Catapult Centres</b> Mette Foss Dalseg, Learning factory, Norway</li> <li><b>3. Campus des Métiers</b> Laurent Renaux, TechnoCentre Henri Fabre, France</li> <li><b>4. SIM Project - 4.0 Innovation Peer Learning for Companies</b> Margarida Segard, ISQ Academy, Portugal</li> <li><b>5. Excellent Advanced Manufacturing 4.0</b> Unai Ziarsolo, TKNIKA, Spain</li> </ol>		
<b>12:30–13:30</b>	<b>Lunch</b>		
<b>13:30–15:30</b>	<b>Peer learning via practical examples in ‘SMEs and engaging them in the VET cycle’</b> Session II – discussing practical examples in a World Café format  First 60 minutes, examples: presenters 1, 3 & 4 as table hosts Second 60 minutes, examples: presenters 2 & 5 as table hosts  <i>Guiding questions include:</i> <ul style="list-style-type: none"> <li>• <i>What is the added value of this example?</i></li> <li>• <i>How exactly are these examples taught? Are they anchored in curricula, or taught by companies during employment, or via modular delivery at schools?</i></li> <li>• <i>Which elements seem to be transferable to other European countries/ contexts?</i></li> </ul>		
<b>15:30–15:45</b>	<b>Coffee break</b>		
<b>15:45–16:45</b>	Transferability of practice in ‘SMEs and engaging them in the VET cycle’ Arne Ronny Sannerud, Professor, OsloMet, Norway Max Ehlers, Associate Officer IT, UNESCO-UNEVOC		
<b>16:45–17:00</b>	<b>Wrap up Day 1</b> Arne Ronny Sannerud, Professor, OsloMet, Norway		
<b>18:30</b>	Group Dinner		

**3 October****Thursday****09:00–09:30****Topic 2: Teacher training & teacher-learner interface**

- **Presentation of the key challenges**  
Arne Ronny Sannerud, Professor, OsloMet
- **International Roadshow – Digital Media in TVET**  
Vera Hark, Project Manager/Technical Advisor, BIBB

**09:30–11:00****Peer learning via practical examples in ‘Teacher training & teacher-learner interface’**

Session I – Presentation of practical examples:

1. **21st Century Skills**  
Ronald Ferket, CINOP, Netherlands
2. **VR Glasses for Gardeners (title tbc)**  
Martin Dobricki, SFIVET, Switzerland
3. **LEGO Mindstorms (LEGO Education)**  
Birger Brevik, OsloMet, Norway

Discussing practical examples in a World Café format:  
Presenters 1, 2, & 3 as table hosts

*Guiding questions include:*

- *What is the added value of this example?*
- *How exactly are these examples taught? Are they anchored in curricula, or taught by companies during employment, or via modular delivery at schools?*
- *Which elements seem to be transferable to other European countries/ contexts?*

Participation of an observer UNEVOC Centre from Uganda, Kyambogo University, Center for Vocational Pedagogy and Lifelong Learning

**11:00–11:15****Coffee break****11:15–12:45****Peer learning via practical examples in ‘Teacher training & teacher-learner interface’**

Session II – Presentation of practical examples:

4. **Digitalization self-assessment for students (title tbc)**  
Johanna Bachmair, IBW, Austria
5. **VET 4.0**  
Christian Schrack, BMBWF, Austria
6. **EQF Robot Operator/Robot Technician**  
Anu Moosel, Foundation Innove, Estonia

Discussing practical examples in a World Café format:  
Presenters 4, 5, & 6 as table hosts

3 October	Thursday
	<p><i>Guiding questions include:</i></p> <ul style="list-style-type: none"> <li>• <i>What is the added value of this example?</i></li> <li>• <i>How exactly are these examples taught? Are they anchored in curricula, or taught by companies during employment, or via modular delivery at schools?</i></li> <li>• <i>Which elements seem to be transferable to other European countries/ contexts?</i></li> </ul>
<b>12:45–13:45</b>	<b>Lunch break</b>
<b>13:45–14:45</b>	<p><b>Transferability of practice in ‘Teacher training &amp; teacher-learner interface’</b></p> <p>Arne Ronny Sannerud, Professor, OsloMet Max Ehlers, Associate Officer IT, UNESCO-UNEVOC</p>
<b>14:45–15:15</b>	<b>Workshop networking session</b>
<b>15:15–15:45</b>	<b>Networking coffee</b>
<b>15:45–16:15</b>	<p><b>Wrap up and closing</b></p> <p>Arne Ronny Sannerud, Professor, OsloMet Tristan Cole, Project Officer, UNESCO-UNEVOC</p> <p>Q&amp;A Including feedback by participants</p>
<b>16:15</b>	<b>End of workshop</b>



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### Design

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