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Education and Training



Virtual conference on the future of TVET teaching and learning

Virtual conference report

UNESCO-UNEVOC TVeT Forum, 7 to 14 October 2019

Moderated by Gita Subrahmanyam

This virtual conference was held as a contribution to UNESCO-UNEVOC's Trends mapping study on the future of TVET teaching and learning

Virtual conference report **AT A GLANCE**



UNESCO's 2015 Recommendation concerning technical and vocational education and training (TVET) reminds us that TVET in all forms and settings should be oriented to equipping all youth and adults with relevant knowledge, skills and competencies for work and life, and that this should be done through an overall lifelong learning framework. The Recommendation recognizes the crucial role of teaching staff in assuring TVET quality and relevance, and states that 'policies and frameworks should be developed to ensure qualified and high-quality TVET staff, including teachers, instructors, trainers, tutors, managers, administrators, extension agents, guidance staff and others'. Yet implementing this Recommendation may not be so straightforward, given the unprecedented impacts that global disruptions like climate change, the Fourth Industrial Revolution, digitalization, migration and demographic change are having on people's lives, the world of work and the world of learning.

The virtual conference on the future of TVET teaching and learning was held from 7 to 14 October 2019. It was open to all members of the UNESCO-UNEVOC TVeT Forum, an online community with more than 6100 members. The conference sought to gather knowledge, insights, experiences and practices from the international TVET community on the future of TVET teaching and learning in the context of these global disruptions.

Insights gained from the virtual conference will form part of the evidence base for a forthcoming UNESCO-UNEVOC trends mapping study on the 'future of TVET teaching and learning'.

Key reflections

The future of work will likely be characterized by rapid technological advancement, heightened competition for jobs and a demand for new and specialized skills, which will require parallel shifts in the world of learning

Specialized skills and knowledge will continue to be important, but workers will also need ICT/digital, transversal and 21st century skills, and must be able to apply their skills and knowledge to solving real world problems.

Teachers and trainers need 21st century skills, a lifelong learning mindset and the ability to impart information in a demand-driven, learner-centred way

TVET teaching staff need the same skills package as their students, since they cannot impart competencies that they themselves lack. They also require training in modern vocational didactics and new technologies to deliver training that is both demand-driven (responding to the future skills needs of employers) and learner-centred.

TVET teachers and trainers need support to deliver future-oriented training

Support needed includes access to accurate information and up-to-date infrastructure and equipment, as well as quality pre-service and continuing training opportunities.

Partnerships are key to delivering future-oriented skills

Strategic partnerships can help improve countries', TVET institutions' and TVET teaching staff's responsiveness to future skills needs by overcoming barriers to providing TVET teaching staff with future-focused training opportunities and other support.

Background

UNESCO's [2015 Recommendation concerning technical and vocational education and training \(TVET\)](#) reminds us that TVET in all forms and settings should be oriented to equipping all youth and adults with relevant knowledge, skills and competencies for work and life, and that this should be done through an overall lifelong learning framework. The Recommendation recognizes the crucial role of teaching staff in assuring TVET quality and relevance, and states that 'policies and frameworks should be developed to ensure qualified and high-quality TVET staff, including teachers, instructors, trainers, tutors, managers, administrators, extension agents, guidance staff and others'. To this end, the Recommendation asks Member States to build the necessary institutional capacities to 'ensure the relevance of TVET to current and evolving needs in the world of work, nationally, regionally and internationally, including those implied by the transitions to green occupations, economies and societies'.

Yet implementing this Recommendation may not be so straightforward, given the unprecedented impacts that global disruptions like climate change, the Fourth Industrial Revolution, digitalization, migration and demographic change are having on people's lives, the world of work and the world of learning. The resulting transformations, especially the emergence of new job roles, call for learners to continuously upgrade their knowledge, skills and competencies in line with evolving labor market needs, which in turn requires flexible and responsive TVET programmes with up-to-date curricula and state-of-the-art teaching and training methods (both theoretical and practical). However, despite the expansion of support mechanisms for TVET teaching staff in many countries – specifically concerning new pedagogies, curricula and technologies – challenges persist in ensuring that TVET teachers and trainers possess future-oriented competencies that they can pass on to students.

The implications of global disruptions for the future of TVET teaching and learning are yet to be fully unpacked, understood and synthesized into an actionable framework. This virtual conference sought to gather knowledge, insights, experiences and practices from the international TVET community on the future of TVET teaching and learning in the context of global disruptions. Insights gained from the virtual conference will form part of the evidence base for a forthcoming UNESCO-UNEVOC trends mapping study on the 'future of TVET teaching and learning'.



Overview

The aim of the virtual conference was to:

- Collect insights on the skills needed for the future of work in the context of global disruptions, and the impacts of these disruptions on different forms of TVET teaching and learning.
- Gather knowledge, experiences and practices on the steps that TVET systems should take – at policy, institutional and practitioner levels – to prepare teachers and trainers to deliver the skills needed in the 21st century and beyond.
- Collate evidence from the international TVET community as a contribution to the UNESCO-UNEVOC trends mapping study on the ‘future of TVET teaching and learning’, and as a first step to developing an actionable framework for improving the responsiveness of TVET to an increasingly complex and rapidly changing labour market.

The following topics were opened for discussion during the virtual conference:

Thread 1: The future of work and learning

This thread sought to collect views and evidence of the context in which education and skills development will take place in the future. Relevance in TVET means providing the skills demanded in the workplace, while changes in the way work is done may necessitate new educational content and delivery structures. Participants were asked, amongst others, the following questions:

- What are the most noticeable changes in workplace organization and practices that have occurred over the past 3 years, and what major shifts are expected to occur over the next 10 years? How will these changes affect the demand for workers and skills?
- In what areas are there currently skills gaps, and what skills will workers likely require in the future?
- How should TVET be taught and what should be taught in TVET programs to ensure that graduates have the skills they need for the future of work? Do additional steps need to be taken to ensure that no one gets left behind in the market for future-oriented skills?

Thread 2: Skills needs of teachers and trainers in a responsive TVET system

Responsive TVET systems are those that supply the skills demanded in the workplace. As teachers and trainers are at the frontline of TVET delivery, they need to possess future-oriented competencies in order to pass them on to students. This thread was concerned with the skills needs of teachers and trainers in a responsive TVET system. It sought to gather insights on what knowledge, skills and competencies TVET teachers and trainers possess, or still need, to be able to deliver future-oriented training. It also sought to elicit ideas, research or practices on how to bridge the skills gap to improve TVET effectiveness across different locations (schools, colleges, in-company, private institutes, etc.) and formats (in-class, online, blended, etc.). Participants were asked, amongst others, the following questions:

- What skills do TVET teachers and trainers need to be future ready, and what skills do they currently possess or lack? Where are the gaps, and how can they be bridged?
- How can TVET teacher training systems be adapted to improve their responsiveness to the changing content, methods, pedagogies and/or technologies needed to deliver skills to learners across different training locations and formats?
- Can you share any practices from your country/region for improving access to quality training for both young and seasoned teachers/trainers?

Thread 3: Support needed by TVET teachers and trainers to deliver future-oriented skills

In a rapidly changing and increasingly complex labour market, TVET teachers and instructors need training as well as other support to deliver the skills of the future. This thread was concerned with the current support mechanisms available to TVET teachers and trainers across different countries/

regions to help them fulfill their role as disseminators of future-oriented skills, as well as the support mechanisms needed in the future. It sought to collect evidence on what support mechanisms exist to equip TVET teachers and trainers with state-of-the-art teaching and training methods (both theoretical and practical), as well as what incentives are offered to motivate teachers and trainers to continually assess and acquire the knowledge, skills and competencies they need to offer training in line with sectoral and methodological changes. Participants were asked, amongst others, the following questions:

- What training and support do TVET teachers and instructors need to deliver future-oriented skills? Do they need special training and support to ensure that the future of learning is inclusive and equitable?
- What can governments and TVET institutions do to prepare and support TVET teachers and trainers to deliver the skills needed for the future of work and learning?
- What policies or mechanisms can be put in place to ensure that TVET teachers and trainers continuously monitor and take steps to address their own skills needs? Is such an expectation realistic and/or actionable?

Thread 4: Key partnerships for improving TVET effectiveness through teacher-focused interventions

Teacher- and trainer-focused interventions aimed at improving TVET responsiveness and effectiveness are currently being implemented by a range of stakeholders across the world. Evidence also shows that partnerships between stakeholders at different levels are needed to rapidly and sustainably overcome the financial, technical and/or infrastructural barriers that many (especially poorer) countries face in improving TVET quality and relevance. This thread sought to identify which stakeholders are taking steps to improve TVET quality through teaching interventions and what roles they play in different countries/regions. It also sought to gather examples of innovative projects and partnerships that have led to improvements in TVET quality and relevance through teacher-focused interventions. Participants were asked, amongst others, the following questions:

- Which stakeholders are involved in training and supporting teachers and trainers in your country/region, and what role do they play? What are the impacts of their interventions on TVET quality and relevance?
- Do you know of any innovative projects or partnerships that have led to improvements in TVET quality and relevance through teacher-focused interventions? Can you provide any information on these interventions?
- What actions are different stakeholders (individually or collectively) taking to improve the relevance of TVET teaching – for example, by improving access to information on future labor market trends? Can you provide any examples of promising practices in this area?

Intended outcomes

It was intended that at the end of this virtual conference, participants would be able to:

- Understand the impacts of global disruptions on the future of work and learning, and explain how these developments present challenges as well as opportunities for TVET teachers' and trainers' role in fostering responsive, future-oriented TVET systems
- Recognize the importance of continuous TVET teacher and trainer development and identify the types of support mechanisms that teachers and trainers need to deliver the skills of the future in a rapidly changing and increasingly complex labour market
- Appreciate the role that different stakeholders (governments, TVET institutions, employers and other key partners) play in supporting and motivating TVET teachers and trainers to deliver relevant and high-quality skills
- Identify policies and practices that can improve the responsiveness of TVET systems through the medium of TVET teachers and trainers

Key reflection

The future of work will likely be characterized by rapid technological advancement, heightened competition for jobs and a demand for new and specialized skills, which will require parallel shifts in the world of learning

In terms of what skills will be required for the future of work, participants agreed that specialized skills and knowledge will continue to be important, but workers will also need ICT/digital, transversal and 21st century skills, and must be able to apply their skills and knowledge to solving real world problems. To remain productive in a rapidly changing labour market, workers will need to embrace a culture of lifelong learning and have the skills to create their own employment opportunities. The concept of education for sustainable development (ESD) aims to transform society by reorienting education and helping people to develop the knowledge, skills, values and behaviours needed for sustainable development. TVET is not exempt from this requirement, and to protect themselves and the environment from exploitation, TVET graduates and workers will need to develop sustainable attitudes and behaviours (towards, for example, the efficient use of energy and use of renewables) and have knowledge of labour law, occupational health and safety, and human rights.

In the context of global disruptions and changing skills demands, participants agreed that both the content and processes by which TVET is delivered need to be more demand-driven and future-focused. For example:

- A participant from Qatar remarked: “Based on our extensive work with industry here, there are indications that the future of work and learning will increasingly require varied, learner-driven pathways with diverse options such that few students will have an identical and uniform program of study, but will render workers who are highly and uniquely skilled”
- Likewise, a participant from Kenya said: “The TVET sector must integrate ICT in teaching and learning and work with the industries. This will ensure currency of instructors and that the content delivered is what the industry requires.”

Several good practice examples in aligning TVET to future skills needs were presented during the conference (see box to the right). On the other hand, some participants spoke of persisting challenges their countries face in preparing TVET learners for the future of work:

- “Our Government has spent substantial funds in education and training. At least 7% of our National Budget goes towards this sector. However, no significant research is conducted into new and emerging work trends which can guide the development of new TVET or skills development programmes to fulfill the demands of the changing workplace.” (Participant from Trinidad and Tobago)
- “In my country, the Government for the last five years or so has made it mandatory for all pupils in primary school to secondary school to take up technology studies. However, these policies have been very challenging to implement fully because of lack of ICT infrastructure especially in the rural areas.” (Participant from Zambia)

A TVET school in Italy - **Apro Formazione** - interviewed 60 local companies in 2018 regarding the skills and competencies they will require in the future. It used the findings to set up new training programmes and courses and to establish regional, national and international networks. The school also periodically organizes ‘Tech Days’, where technicians from large companies come to the school to present their products and processes, and discuss issues concerning industry 4.0, automation and innovation with teachers and students.

A TVET institution in the USA will soon be conducting an occupational analysis of the current and future competencies required by maintenance technicians, who are employed in many small- and medium-sized machine shops in Illinois. Findings from the analysis will be used to update the institution’s courses and workshops.

A new report by the UNESCO-ITU Broadband Commission for Sustainable Development¹ shows that limited progress has been made globally in providing workers with digital skills. Some countries and groups (e.g. women) are at greater risk of being left behind as the speed of technological change increases, not because of affordability but due to lack of literacy, digital skills and/or access to technology.

¹ The State of Broadband: Broadband as a Foundation for Sustainable Development, September 2019. https://www.itu.int/dms_pub/itu-s/opb/pol/S-POL-BROADBAND.20-2019-PDF-E.pdf

Key reflection

To be future ready, teachers and trainers need 21st century skills, a lifelong learning mindset and the ability to impart information in a demand-driven, learner-centered way

Participants pointed out that TVET teaching staff (teachers, trainers, instructors, etc.) need the same skills package as their students, since they cannot impart competencies that they themselves lack. They also require training in modern vocational didactics and new technologies to deliver training that is both demand-driven (responding to the future skills needs of employers) and learner-centered (responding to the needs of, amongst others, 'Generation Z' and other groups who have grown up with or use information technology and thus might have problems learning when taught using traditional didactic methods). They should also develop a lifelong learning mindset, including a willingness to learn about emerging concepts (such as sustainable development, ICT and entrepreneurship) and new pedagogical methods (such as MOOC, mobile learning and simulation) to integrate those concepts into their teaching. In addition, they need training in educational psychology to manage the anxieties that young learners and adult workers are experiencing in the context of global disruptions, as well as in diversity to offer inclusive education in an increasingly interconnected world. They also need foreign, especially English, language skills to communicate with and learn from other countries.

Participants also highlighted practices TVET teaching staff should engage in to ensure that their own – and their students' – knowledge, skills and competencies remain current and relevant:

- "It is critical that the instructors deliberately commit to work in the industry for a specified amount of hours to appreciate the new technologies, equipment and work-readiness skills critical for the learners." (Participant from Kenya)
- "If we focus specifically on the role that the teacher must adapt to stimulate students' creativity, we could say that it would be a sociocultural mediator and a facilitator that creates the right conditions to mobilize divergent thinking as opposed to convergent thinking. That is, the teacher would go from being an exclusive transmitter of content to a designer of learning spaces where the main axis of the teaching plan is no longer exclusively in the content to be learned and developed but the technical skills on how to find and share information" (Participant from Spain)

Several innovative practices in upgrading TVET teaching staff's knowledge, skills and competencies in line with future needs were presented during the conference (see box to the right).

The **University of Management 'TISBI'**, a UNEVOC Centre in the Russian Federation, offers a scientifically-based training module ("Digital technologies and ICT in teacher training activity") that teaches TVET teachers and trainers how to create and use ICT and 3D technologies in their daily professional activities. Training is delivered by the CISCO Networking Academy via face-to-face seminars using a multimedia complex with 3D visualization. Teachers and trainers are taught how to use software products and are also given the opportunity to work independently with the latest equipment.

Tknika, a UNEVOC centre in the Basque region of Spain, has developed the Irekin Initiative for teacher training in entrepreneurship. With the aim of "seeking out entrepreneurial teachers at entrepreneurial centres to make entrepreneurial students", the initiative has drawn up a training itinerary consisting of six stages aimed at developing teachers' competencies in three areas: appreciating the importance of fomenting entrepreneurial initiative in students; teachers' economic and business polish; and knowledge and design of good practices. Good practice contests are arranged to collect and disseminate inspiring entrepreneurial practices as well as to encourage sharing of knowledge and experience. For more information: <https://tknika.eus/en/cont/proyectos/irekin-initiative-oriented-toward-entrepreneurial-teachers/#>

However, some participants outlined persisting challenges that their countries or regions face in preparing TVET teaching staff for the future of learning, including a lack of knowledge and confidence in new technologies and work processes:

- “[I]n Nigeria, trainers in Government Technical Colleges are still far from having the right knowledge needed to improve TVET in our schools. It is time to invest in teachers/trainers to possess the right skill for sustainable development in TVET. Electrical and Electronics teachers to be exposed to Principle of Automation, Advanced Automation and Robotics - the syllabus should be reviewed to contain this new level of knowledge available in the industries. Block-laying and Bricklaying teachers should be trained on the latest software for designs and building construction.”
- “[T]rainers state a lack of confidence and critical use of ICT. The main causes can be found in the high average age of trainers, that did not experience directly digital technology as learners and teachers, and in the lack of digital competences, to cooperate and communicate through ICT and to use specific devices and software.” (Participant from Italy, sharing the findings of an analysis of European teachers' digital competence needs)

Key reflection

TVET teaching staff need support to deliver future-oriented training

In terms of what support TVET teachers and trainers need, participants identified several key requirements:

- Access to accurate information on changing patterns in the world of work
- Up-to-date infrastructure and equipment, as well as clear policy guidelines on their use
- Access to quality pre-service and continuing training and professional development opportunities
- Strong management support, including an organizational culture that allows for bottom-up processes
- Adequate financial resources
- Assistance in developing partnerships with businesses and other key stakeholders

In terms of who should provide this support, participants recognized the roles of both government and managers of TVET institutions. For example, a participant from Zambia remarked that “[I] believe there is a need for Government sanctioned collaborations between TVET institutions and strategic companies to work together on key projects. This model will allow TVET institutions to have a practical view of what exactly industry needs as it may be hard for these linkages to be formed independently.”

However, participants also identified challenges that TVET teaching staff face in obtaining the funding and other support needed to deliver the skills of the future:

- “Our institution is renewing its laboratories and premises every year as every year companies evolve in their processes, products, and services... but we do need to search every year for financial resources to cover such investments.” (Participant from Italy)
- “In Nigeria, there is little or no evidence of government involvement in provision of any formal platform for TVET teachers and educators to acquire right and current skills to effectively deliver on their mandate. TVET teachers resort to solo efforts to properly skill themselves.” (Participant from Nigeria)

Teachers of Mechanical Manufacturing and Automation courses at the **Sino-Zam Vocational College of Science and Technology** in Zambia are recruited, paid and provided with comprehensive training by Shaanxi Polytechnic Institute in China. New teachers are required to undergo six-month pre-service training at Shaanxi Polytechnic, which teaches them how to operate relevant machinery and equipment, how to offer practical training to students, new teaching methods (e.g., how to use the college's online courses), ICT, and some Chinese language. Visits to partner industries are arranged for teachers during their time in China and, upon their return home, teachers visit Chinese industries in Zambia to gain an understanding of the context in which their programmes are being delivered.

Key reflection

Partnerships are key to delivering future-oriented skills

Participants highlighted the benefits of strategic partnerships for improving countries', TVET institutions' and TVET teaching staff's responsiveness to future skills needs by overcoming barriers to providing TVET teaching staff with future-focused training opportunities and other support. The private sector was cited as the most important partner for providing insights into changes taking place in the world of work, as well as for overcoming resource constraints:

- "Some industries have 'adopted' TVET institutions so that they can equip them with current equipment and skills so that they get quality employees." (Participant from Kenya)
- "In order to offer up-to-date TVET programs it helps to involve companies and real work processes. In an ideal economic environment, they provide top notch machines and work processes etc., which will add to the quality of the TVET program." (Participant from Germany)

Other important partners identified during the conference included:

- Other educational institutions - in particular, universities and research centres – for their role in improving the quality of training received by TVET teaching staff and providing research on future skills needs.
- Political leaders and/or government agencies, since funding is critical for the success of these initiatives
- Other sectors - e.g., mental health and addiction services for support in managing learner anxieties and stress
- NGOs/CSOS – to provide local support to initiatives (e.g., training space, infrastructure, relevant contacts, etc)
- Development partners – to fill funding gaps faced by governments and link TVET institutions and practitioners to international experts and technical assistance

Participants also emphasized the importance of networks and partnerships between TVET teachers and trainers for peer-to-peer learning and mutual support, as well as to strengthen the relationship between theory

Teachers, trainers and tutors at **Cometa Formazione** VET schools in Italy, a UNEVOC Centre, are encouraged to develop practice-led research projects as part of their continuous teacher training activities. Twenty of these educators have used their experiences of implementing reality-based learning approaches at Cometa as the basis for their PhDs, which in turn has led Cometa to establish its own in-house research department, Cometa Research, which cooperates with several international universities and research centres. Cometa is currently working to consolidate a community of practice of experts on social-emotional learning and life skills - the Karanga Global Alliance - which operates through learning platforms to support teachers and trainers, as well as policymakers and institutions, in providing quality and equitable social-emotional learning and life skills training. For more information: <http://www.puntocometa.org/home/english-area/>

In **Mexico, Nigeria, Senegal and Pakistan**, teacher training is being delivered through use of mobile technology to overcome the challenges experienced by poorer countries in delivering teacher training. The project, which was developed by UNESCO, offers in-service training to (mainly general education) teachers but could be adapted to meet the needs of TVET teachers preparing to enter classrooms. After all, recent studies show that in many countries pre-service training is not routinely offered to TVET teachers, partly due to financial constraints. The UNESCO mobile training project has been found to have positive impacts on the targeted teachers' frequency and skills in using ICT, as well as their frequency in use of ICT for teaching. For more information: <https://unesdoc.unesco.org/ark:/48223/pf0000251511/PDF/251511eng.pdf>

To overcome the challenges that African countries face in improving TVET responsiveness to future skills needs, the Commonwealth of Learning (COL) in partnership with the Commonwealth Association of Polytechnics in Africa (CAPA) established the **Innovation in Vocational Education and Skills Training in Africa (INVEST Africa)**. INVEST Africa's mission is to expand the scale, efficiency and quality of learning by using online distance learning and technology-based approaches. Online training for TVET teachers and trainers - including those in the informal sector - is provided through the COL Learning Management System workshops, supplemented by institutional visits and an online community of practice for interaction and collaboration. COL has also assisted some partner institutions to upgrade their ICT infrastructure. For more information: <https://flexibleskillsdevelopment.ning.com/>

and practical skills. As a participant from Germany stated, “teachers and trainers must not work in isolation. They should work in teams and in cooperation, today more than ever. They should be sharing and learning together, onsite and online.”

However, participants also recognized challenges to developing partnerships with important stakeholders - for example, the private sector. A participant from Mozambique remarked that “[i]n Mozambique, for instance before the TVET Reform System was introduced, companies did not care much about training itself or contributing in that direction. Their concern was much in recruiting skilled competent labour with at least 5 years work experience not caring where and how the competencies were acquired.”

Shared resources and learning materials

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Videos

UNESCO (2019). Futures of Education: Learning to Become. Retrieved from <https://youtu.be/7865y7hbehY>

This video introduces UNESCO's Futures of Education initiative which aims to rethink how knowledge and learning can shape the future of humanity and the planet. Looking to 2050 and beyond, the initiative seeks to reimagine how education and knowledge can contribute to the global common good.

Maungaraki School (2015). Retrieved from <https://youtu.be/Y1EGrzf9yQU>

This video briefly summarizes how Maungaraki School adopted future oriented teaching and learning practices, and the significant changes that have enabled this to happen successfully.

About the moderator



Gita Subrahmanyam is founder and director of the Inclusive Development Lab, a UK-based international development consultancy that provides research, training and advice focused on reducing poverty and inequality and building more inclusive and sustainable societies. She is also a university lecturer with affiliations to the London School of Economics and other University of London institutions, where she continues to teach postgraduate courses and offer teacher training, both in the UK and internationally. She holds a PhD in Government and an MSc in Public Policy and Administration from the London School of Economics, as well as a BSc in Economics from the Wharton School, University of Pennsylvania.

Ms Subrahmanyam has authored a range of economic briefs and reports on various aspects of TVET, including the UNESCO Bangkok TVET progress review titled 'Enhancing Relevance in TVET', which formed the basis of the Kuala Lumpur Declaration on Quality Education and Skills Development for a Sustainable Future (2015). This is the second UNESCO-UNEVOC virtual conference that Gita will be moderating. She previously co-moderated the 2013 eForum online conference on 'Tackling Youth Unemployment through TVET'.

Gita is conducting the trends mapping study on the 'future of TVET teaching and learning' for UNESCO-UNEVOC.

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