



United Nations
Educational, Scientific and
Cultural Organization



International Centre
for Technical and Vocational
Education and Training



UNESCO-UNEVOC virtual conference summary report

Innovation in TVET

Hosted on the UNESCO-UNEVOC TVeT Forum, 25 February to 01 March 2019
Moderated by Jan Peter G. de Otero



Published

in 2019 by the UNESCO-UNEVOC International Centre, Platz der Vereinten Nationen 1, 53113 Bonn, Germany



This publication is available in Open Access under the Attribution-ShareAlike 3.0 IGO (CC-BY-SA 3.0 IGO) license (<http://creativecommons.org/licenses/by-sa/3.0/igo/>). By using the content of this publication, the users accept to be bound by the terms of use of the UNESCO Open Access Repository (<http://www.unesco.org/open-access/terms-use-ccbysa-en>).

The designations employed and the presentation of material throughout this publication do not imply the expression of any opinion whatsoever on the part of UNESCO concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The ideas and opinions expressed in this publication are those of the authors; they are not necessarily those of UNESCO and do not commit the Organization.

Author

Jan Peter G. de Otero

Cover

UNESCO-UNEVOC

Layout

Yinglin Huang, UNESCO-UNEVOC International Centre

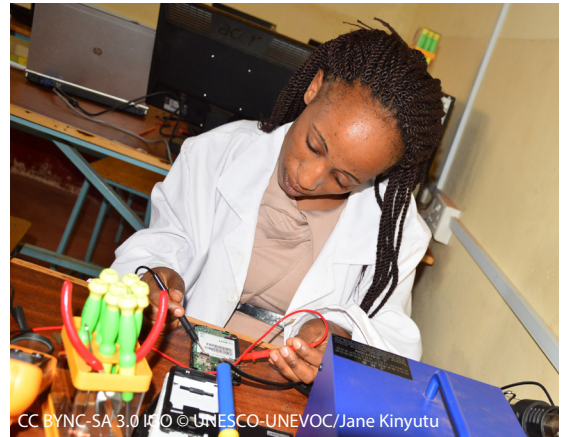


The following summary report captures the main outcomes of a virtual conference on innovation in TVET that took place on UNESCO-UNEVOC's TVeT Forum. The virtual conference was organized as part of a study that maps the trends in innovation in TVET, which feeds into UNESCO-UNEVOC's initiative called Skills for Innovation Hubs (i-Hubs) that is being launched in March 2019 in Bonn, Germany.

Background

UNESCO-UNEVOC's 2018 Global Learning Forum on 'Managing skills in a time of disruption' put a spotlight on the factors shaping the future of the technical and vocational education and training (TVET) landscape, including changes in climate, demography, business and labour markets, technology, and migration. The transition to a green economy, the implementation of digital technologies in the world of work and the emergence of new forms of entrepreneurship are not only changing the profile of jobs but also creating new possibilities for generating solutions for social and economic problems in the form of innovations. On the one hand, this scenario is driving TVET systems to improve their capacity to identify the future demand of skills (e.g. soft and specific technical skills – including digital, greening and entrepreneurial skills) and to expand access to these skills. On the other hand, TVET systems are also leading the way to innovation development by incorporating new activities (e.g. the development of applied research, business incubators, and intellectual property activities), with aims to enhance local innovation capacity and to create greater social and economic impacts.

In all, these changes represent a great challenge for the future of TVET, but at the same time also expresses a need to seize the prospects and enhance the social and economic benefits from TVET in different regions of the world.



Discussions at UNESCO-UNEVOC's Learning Forum underlined that new and radical shifts are needed to ensure that TVET systems can respond to these changes and that TVET systems can no longer just operate according to a 'business-as-usual' model. The speed and scale of change call for a broad process of transformation, with TVET institutions increasingly acting as drivers of innovation in their local ecosystem, and in parallel innovating the learning processes and products offered to youth and adults and increasing citizens' potential to innovate.

As TVET adapts itself to the impacts of significant social, environmental and economic disruptions, innovative practices emerge with great potential to rejuvenate the future of TVET. Current developments in TVET suggest that many types of innovative practices are already being developed or deployed, significantly changing the way we define and practice TVET. However, despite the international appreciation of the important role innovative practices can play to transform TVET, there is a need to better understand what is meant by innovation in the TVET sector and its implications.

For this reason, this virtual conference aimed to discuss different ways through which innovation contributes to the development of TVET. The virtual conference presented and debated the different roles of TVET in systems of innovation, the different use of innovations to improve the quality of TVET, as well as the main barriers to the development of innovation in TVET.

Summary of discussions

Two hundred and thirty two participants from 75 countries attended the virtual conference organized from 25 February to 01 March 2019 on the TVeT Forum.

The conference provided opportunities for participants to share different experiences and ideas on innovation in TVET, including **innovations in products and services** offered by TVET, **innovations in educational processes, innovations in TVET organizational practices,** and **innovations with regards to the relationship with external actors.**

The discussions were informed by earlier publications related to the field of economy, innovation, and TVET, as well as presentations provided by external contributors on applied research in TVET, ICTs in TVET, and strategy and planning for innovation in TVET. Additionally, other resources and links were shared, including short thematic videos, relevant YouTube videos, and different publications.

The virtual conference took place as part of a wider study on innovation in TVET. The outcomes of the discussions will be used to strengthen and reflect upon current literature and studies on the topic. The following summary report provides a snapshot of the discussions.

The discussion in the virtual conference encompassed a number of important topics:

- Topic 1: What is innovation in TVET and is it important?
- Topic 2: Enhancing TVET's impact on innovation development
- Topic 3: How innovations in ICTs can improve TVET delivery
- Topic 4: Creating a culture of innovation in TVET
- Topic 5: Barriers to innovation in TVET



232

participants from 75 countries attended the virtual conference



Topic 1: What is innovation in TVET and is it important

Topic 2: Enhancing TVET's impact on innovation development

Topic 3: How innovations in ICTs can improve TVET delivery

Topic 4: Creating a culture of innovation in TVET

Topic 5: Barriers to innovation in TVET

Topic 1: What is innovation in TVET and is it important

The first topic aimed to discuss how different TVET systems, networks and schools define the idea of innovation in TVET¹, with a focus on discussing the different perspectives and rationales that support the development of innovative practices in TVET². The topic not only presented some of the most important concepts of innovation and their application in the field of TVET, but also discussed the challenges and opportunities related to the development and implementation of innovations in TVET.

Contributions of participants from across the world suggest that innovation in TVET refers to substantial changes in the way TVET is practiced, with aims to make it more relevant to current issues in society, the economy, and the environment. Plus, participants also reflected on innovation as a behaviour and a way of thinking.

The discussions showed that innovation in TVET can include two different perspectives: on the one hand, TVET contributes to the development of business innovation, social innovation or innovation in public sectors. This is what we called the **external perspective**; it is the way in which TVET systems help to enhance the regional and national capacity to generate and implement innovation. On the other hand, innovations are also used to improve the quality of TVET. This is what we called the **internal perspective** of innovation in TVET. TVET systems, networks, and schools can implement innovative practices in teaching and learning, teachers training, and planning and strategy.

Some participants also pointed out the importance of recognizing the strengths of TVET systems, networks and schools while developing innovative practices. This suggests a need to balance change and continuity in TVET:

“a lesson to me in curriculum development - do not take out the golden knowledge of the past.”

(A participant from United Kingdom)

Finally, some participants referred to the technological gap between developed and developing countries, and its impact on the way TVET systems, networks and schools in developing countries understand what innovation in TVET is:

“In the developing world, innovation often implies trying to catch-up with other developed states. Whereas in developed nations, innovation most likely means forging ahead into uncharted waters.”

(A participant from Jamaica)



Business innovation - “business innovation is the creation of substantial new value for customers and the company by creatively changing one or more dimensions of the business system”. (Sawhney et al., 2006)

Social innovation - “...finding acceptable progressive solutions for a whole range of problems of exclusion, deprivation, alienation, lack of wellbeing, and also to those actions that contribute positively to significant human progress and development” (Moulaert, MacCallum and Hillier, 2013).

Innovation in the public sector - includes “all public corporations and general government at central, state and local levels. Its duties cover administration, ensuring public order and safety, education, health and social care, and a variety of other functions for citizens and business.” (Observatory of Public Sector Innovation, 2018)

Along this line, many participants referred to innovation in TVET as some kind of solution to different types of social, economic and environmental problems, with a special focus on labour market issues. It became clear, however, that there is a need to further investigate what innovation in TVET means in the context of developing countries. This investigation will be further conducted within the frame of the trends mapping study on innovation in TVET.

¹ The video about some of the important concepts of innovation and their application in the field of TVET is available here: Innovation in TVET? <https://bit.ly/2XoFKez>

² The video about the challenges and opportunities related to the development and implementation of innovations in TVET is available here: Why is innovation in TVET important? - <https://bit.ly/2SpmVnA>

Topic 2: Enhancing TVET's impact on innovation development

The second topic presented the different roles of TVET in processes of innovation development using a national and regional system approach. This approach on innovation (Freeman, 1988; Lundvall, 1992) suggests that the collective learning between several actors and institutions is the base of the interactive and simultaneous processes of generation, acquisition, and dissemination of innovation.

Participants stated that TVET usually plays a marginal role in "knowledge triangle" – a link between businesses, education, and research. However, innovations in TVET can help to strengthen the development of local and national systems of innovation.

The presentation from Denise Amyot³ – President and CEO of Colleges and Institutes Canada, a UNEVOC Centre – introduced the experience of Canada in developing non-traditional activities in the TVET systems, such as the development of applied research for business and social innovation.

Participants reacted to the video in a very positive way:

"I really share her enthusiasm for this form on enriching the learning experience of the TVET learner, while at the same time providing quality solutions for real needs of the companies."

(A participant from the European Commission)

The virtual conference participants agreed that the role of TVET in systems of innovation is not only focused on competence building (educating and training the labour force for innovation and research and development activities), but also on other activities related to knowledge generation and technology diffusion. Other possible activities can include networking, the formation of new markets, and consultancy services.

From an analytical point of view, we can say that the development of applied research and consultancy services represents a specific type of innovation in TVET: innovation in products and services offered by TVET systems, networks and schools. Plus, the implementation of new activities related to networking refers to innovation in the relationship with external actors. In summary, these are all new opportunities for TVET to expand its scope of activities and create greater impacts in society, the economy, and the environment.



CC BYNC-SA 3.0 IGO © UNESCO-UNEVOC/Charity Thebuho



CC BYNC-SA 3.0 IGO © UNESCO-UNEVOC

³ The presentation of Denise Amyot is available here: Applied Research: Colleges and Institutes Fuelling Innovation <https://youtu.be/dqCyzNtWqpQ>

Topic 3: How innovations in ICTs can improve TVET delivery

The third topic discussed innovations in educational processes. This type of innovation in TVET can be defined as the innovative combinations of specific teaching and learning approaches and techniques that aim to improve learning effectiveness. It involves mainly classroom practices (i.e. teaching and learning) that are also often the most difficult practices of education to change. The topic focused on the use of ICTs in TVET as a type of innovation in TVET processes. According to Saud et al. (2011), “the world of work is in continuous change as ICT itself, thus posing more challenges to the workers in the 21st century and the institutions responsible for their preparation”.

The topic had the participation of Rodrigo Prates (ILO/CINTERFOR), an expert in ICTs in TVET. Mr Prates talked about the use of virtual reality, gaming, augmented reality, and artificial intelligence (A.I)⁴. According to the expert, **the benefits of incorporating virtual reality and augmented reality technologies into educational experiences include that students are able to participate in life-like engagement, resulting in easier application and retention of the subject matter.** Plus, A.I is currently being used in education in the form of customizable content through adaptive learning programmes and software, tracking and monitoring diagnostics, automation of grading and even AI tutors.

In general, participants stated that **innovations in the use of ICT in TVET can be seen as a tool for increasing access to TVET, and enhancing the effectiveness and quality of the education provided by the TVET sector.** The development and integration of ICTs in TVET have been facilitated in previous years because ICT tools are becoming more accessible and interactive. However, digital transformation in society and at the workplace requires fundamental changes in TVET. There is a general understanding that learning in TVET is not likely to improve if the use of ICTs is done based on traditional methods rather than enhancing the interaction between TVET teachers and learners and creating opportunities for TVET learners to experience life-like situations.

4 Videos for Q&A section with Rodrigo Prates:
Part 1 - <https://youtu.be/8vN2vfJZlgk>
Part 2 - <https://youtu.be/2KNORyNOMRo>
Part 3 - <https://youtu.be/aNWps76kUGo>



CC BY-NC-SA 3.0 IGO © UNESCO-UNEVOC



UNESCO's Competency Framework for Teachers:

<https://unesdoc.unesco.org/ark:/48223/pf0000265721>

The *SAMR* model:

<https://www.schoolology.com/blog/samr-model-practical-guide-edtech-integration>

Four C's of 21st century learning:

<http://www.battelleforkids.org/networks/p21/frameworks-resources>

Open Educational Resources in TVET:

<https://unevoc.unesco.org/go.php?q=Open+Educational+Resources+in+TVET>

List of OER resources for TVET:

<https://unevoc.unesco.org/go.php?q=Commented+list+of+platforms+and+services>

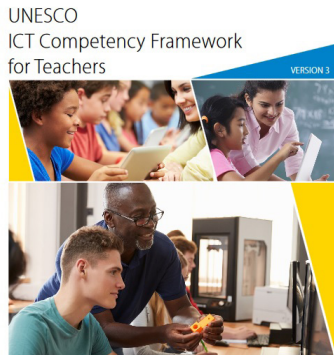
The SELFIE tool created by European Commission:

https://ec.europa.eu/education/schools-go-digital_en

Participants also highlighted different initiatives and tools available to support the use of ICTs in TVET, for example:



*UNESCO's
Competency
Framework for
Teachers*



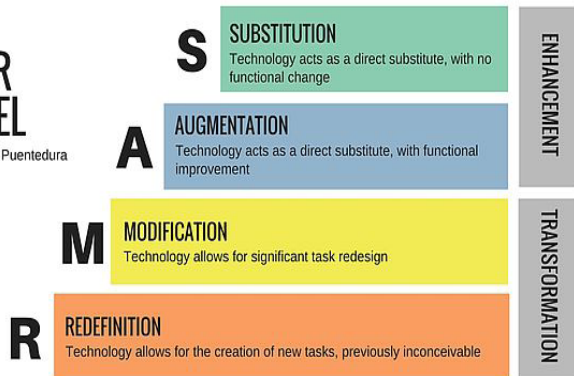
*List of OER resources
for TVET*



*Open Educational
Resources in TVET*

**THE
SAMR
MODEL**

Dr. Ruben R. Puentedura



*The *SAMR* model*

SELFIE tool for schools

supporting learning in the digital age



The SELFIE tool created by European Commission

WHAT ARE 21ST CENTURY SKILLS? THESE 4 C'S:



Four C's of 21st century learning

Topic 4: Creating a culture of innovation in TVET

This topic discussed innovation in organizational practices. Organizational innovation in TVET can be defined as the group of changing activities deployed by TVET systems, networks and schools related to internal administration and management, such as strategic planning, workplace organization, and human resource management. The topic focused on innovation in TVET management practices and innovations in human resource management. While the first type of innovation in TVET refers to strategic planning, institutional objectives and strategies, innovation in human resource management refers to new teacher-training requirements and programmes.

Terry Neal (Commonwealth of Learning) presented the story of INVEST Africa - Innovation in Vocational Education and Skills Training⁵. Ms Neal prepared a very interesting presentation on the importance of strategy and planning for innovation in TVET. She discussed the steps (institutional readiness assessment, development, monitoring and evaluation) to build capacity for innovation (based on the LOTS approach) and also presents the case of the Koforidua Technical University in Ghana.

Participants agreed with the relevance of the LOTS approach suggested by Terry Neal in her presentation. The participants suggested that TVET systems, networks, and schools should have a stronger focus on innovation and technology. But for this to happen, it is also necessary to establish a proper culture for innovation in TVET. The four elements of the LOTS approach seem to encompass quite well the different aspects of what we could call a culture



Other innovation approaches, tools and frameworks exist. For example, UNESCO-UNEVOC's **i-Hubs Initiative** has also developed an innovation framework to test. Together, they serve as reference frameworks that can inform future debates and provide guidance

for innovation in TVET and should be considered when seeking to enhance the development and implementation of innovations in TVET.

The participants also mentioned the importance of finance mechanisms to innovation in TVET:

“Resourcing is a really big area for TVET management to tackle. And connected to it is maintenance and value for money to the institution in long-term. So, we have resourcing and maintenance as part of the management innovation planning.”

(A participant from the United Kingdom)



The LOTS approach

⁵ The presentation of Terry Neal is available here: Strategy & Planning for innovation in TVET: The INVEST Africa story: <https://www.youtube.com/watch?v=vxhnA2EkL70>

Topic 5: Barriers to innovation in TVET

The last topic discussed the constraints that TVET systems, networks and schools are facing while developing and implementing innovative projects and initiatives. The topic provided a framework to analyse some of the common barriers to innovation, based on Hadjimanolis (2003). According to the author, there are three main key points in this discussion:

- 1 Barriers may have a dynamic nature according to the stage of innovation, which increases the difficulty of assessing their exact impact.
- 2 Barriers usually do not act in isolation. Therefore, it is important to understand how different barriers reinforce their impacts, creating a context incompatible to the development and implementation of innovations.
- 3 Barriers may not act directly on the organization (e.g. TVET institutions) but may have their effect during one or more stages of the innovation process through intermediates, such as banks, customers/students or other TVET institutions.

A short-video presentation⁶ introduced the main types of barrier, divided in **internal (people related barriers, structure related barriers, and strategy related barriers)** and **external barriers (market-related barriers, government-related barriers, and other external barriers)**.

Participants agreed that **external barriers** to innovation can represent a great issue since TVET systems, networks and schools are not able to directly control or intervene against it. Therefore, in order to overcome external barriers, TVET must be able to act in partnership with regional authorities and national governments. Plus, **internal barriers** to innovation in TVET were highlighted, including the resistance from TVET managers, teachers, and students to adopt new learning approaches.

The topic also discussed the importance of identifying the main barriers to innovation in the early stages of the development and implementation of innovations in TVET. According to Hadjimanolis (2003, page. 570), “this internal process should start with a realization of the importance of identifying barriers and a systematic look into their sources, both externally and within the firm. (...) While raising awareness and attention is a first step, their classification by importance and devising ways to overcome barriers are equally important steps in the process of eliminating barriers. It is particularly important to eliminate or minimize barriers at the early stages of innovation”.

6 The video presentation on barriers to innovation is available here: Barriers to Innovation - <https://bit.ly/2H7w6Hd>



About the moderator

Jan Peter G. de Otero is an experienced adult and vocational education specialist, with a relevant professional background working as a project manager in the National Service of Commercial Apprenticeship in Brazil. Jan Peter has a Master's Degree in Education from the Pontifical Catholic University of Rio de Janeiro, Brazil, as well as a Certification on Education Quality from the Organization of American States. In the last years, Jan Peter is conducting his Ph.D. research on the integration of TVET in systems of innovation at the University of Osnabrück, financed by the German Academic Exchange Service (DAAD).

Since 2018, Jan Peter is working as a consultant and conducting a trends mapping study on innovation in TVET for UNESCO-UNEVOC.



References

Freeman, C. 1988. *Japan: A New National System of Innovation?* In G. Dosi, C. Freeman, R. Nelson, G. Silverberg, L. Soete (eds.), *Technical Change and Economic Theory*. (pp. 330–348). London and New York: Pinter Publisher.

Hadjimanolis, A. 2003. *The barriers approach to innovation*. In: Larisa V. Shavinina (Ed.), *The International Handbook on Innovation* (pp. 559-573). Oxford, UK: Elsevier Science.

Lundvall, B-Å. 1992. *National Systems of Innovation. Towards a Theory of Innovation and Interactive Learning*. London and New York: Pinter Publisher.

Moulaert, Frank and MacCallum, Diana and Hillier, Jean. 2013. *Social Innovation: intuition, precept, concept, theory and practice*. In Moulaert, F. and MacCallum, D. and Mehmood, A. and Hamdouch, A., *The International Handbook on Social Innovation: Collective Action, Social Learning and Transdisciplinary Research*, pp. 13-24. Cheltenham: Edward Elgar.

Observatory of Public Sector Innovation. 2018. Definition of innovation in public sector. Accessed on 01 February 2019: <https://www.innovationpolicyplatform.org/content/public-sector-innovation>

Saud et al. 2011. *Effective integration of information and communication technologies (ICTs) in technical and vocational education and training (TVET) toward knowledge management in the changing world of work*, *African Journal of Business Management* Vol. 5(16), (pp. 6668-6673).

Sawhney, M., Wolcott, R. C., & Arroniz, I. 2006. *The 12 Different Ways for Companies to Innovate*. *MIT Sloan Management Review*, v.47, n.3, p.75-81.

Contact us

UNESCO-UNEVOC International Centre for TVET
UN Campus
Platz der Vereinten Nationen 1
53113 Bonn
Germany



unevoc@unesco.org



[@UNEVOC](https://twitter.com/UNEVOC)



unevoc.unesco.org



[@UNEVOC](https://www.facebook.com/UNEVOC)

