



UNESCO-UNEVOC study on the trends shaping the

Future of TVET teaching



UNESCO-UNEVOC International Centre

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Trends mapping studies

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Overview of the findings and recommendations

UNESCO's 2015 Recommendation concerning technical and vocational education and training (TVET) states that TVET in all forms and settings should be oriented towards 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 and training staff in assuring quality and relevance of TVET, 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'.

Implementing these recommendations is not always straightforward, given the unprecedented impacts that global disruptions like climate change, digitalization, the Fourth Industrial Revolution, demographic shifts and migration are having on our lives, the world of work and the world of learning. The resulting transformations, especially the emergence of new job roles, call for learners to upgrade their knowledge, skills and competencies continuously to remain relevant in a rapidly changing labour market. These shifts in turn are driving changes to not only the content and format of TVET programmes, but also TVET teaching and training methods (both theoretical and practical). Yet, 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.

UNESCO-UNEVOC's trends mapping study on the future of TVET teaching and learning aimed to engage the international TVET community to: (i) improve the understanding of the implications of global disruptions; (ii) gather knowledge, insights, experiences; and (iii) highlight promising practices in preparing TVET teaching staff to deliver the skills needed in the 21st century and beyond. The study was conducted in several phases, including a two-week virtual conference held in October 2019, an online survey open to international TVET community between November 2019 and January 2020, and a peer review process with a panel of TVET experts in April 2020.

At the time of writing the final report, the COVID-19 pandemic disrupted everyday lives. It resulted in the closure of education and TVET institutions and influenced the continuation of training. Many institutions quickly switched to online and distance learning modes. However, the preparedness of TVET staff was a major concern. As a global disruption, the COVID-19 pandemic reaffirmed assumptions about the future training needs of TVET staff and to the need to prepare them to use ICT/ digital learning tools, and to teach about entrepreneurial learning and sustainable development, including green economies.

Main findings and summary of 10 trends

Based on the evidence gathered, the study identified ten forward-looking trends that characterize high-quality, future-focused TVET systems which support TVET teaching staff in delivering the skills required for the future of work and learning. Trend 1 addresses the changing nature of work, Trend 2 and 3 highlight the characteristics of future-focused TVET systems, and Trends 4 to 10 examine key aspects of the quality training and support required by TVET teaching staff.

- **Trend 1: As digitalization and automation are changing the world of work, demand for transversal and applied skills are most likely to grow in next 10 years.** The spread of new technologies and other changes taking place in the world of work are redefining what skills workers need to remain productive. While traditional skills will continue to play an important role in the future, new skills in emerging areas, transversal skills such as problem-solving, and cross-occupational competencies in areas such as entrepreneurship, will be demanded more frequently.
- **Trend 2: Collection and dissemination of data on emerging skills for planning is becoming critical for future-oriented TVET programmes.** TVET systems need accurate and continuously updated information on what these skills requirements are. Data must be regularly gathered and systematically disseminated to TVET institutions and teaching staff. The most important source of information on current and evolving skills needs is the private sector, so TVET systems should actively engage the private sector in their data-gathering exercises.

- Trend 3: Results of skills assessment are being used to develop in-service and not so much to reform pre-service training.** The demands on TVET teaching staff are growing. Teacher and trainers are now expected to possess future-oriented skills, be self-directed learners, and be sensitive and inclusive with regards to gender, cultural and learning differences and social disadvantage. To fulfil these high expectations, TVET teaching staff need strong training and support. Future-focused TVET systems have frameworks in place to deliver pre-service and in-service training, regularly assess teaching staff's skills and training needs, and develop or reform training programmes based on these assessments.
- Trend 4: Future-focused TVET systems value industry experience and exposure as part of pre-service training.** Quality pre-service training not only builds teachers' and trainers' professional skills but also enables reforms to take place. However, pre-service training can no longer be a time bound academic course leading to a qualification. To provide TVET teaching staff with the practical skills and knowledge needed to prepare learners for the future, pre-service training must include industry experience or industry exposure. TVET teachers/trainers also need grounding in active, learner-centred pedagogy to build learners' cross-curricular skills and cross-occupational competencies.
- Trend 5: Linking in-service training to career progression increases the TVET staffs openness to adopting new methods of teaching and learning.** Continuous professional development enables TVET teaching staff to keep up to date with new developments in their subject field and the world of work. It is especially important in a rapidly changing labour market, where skills requirements change regularly. To overcome teachers' and trainers' reluctance to undergo in-service training, long-term future-oriented incentives are needed. Certification of teaching staff competencies linked to career progression can create a pull for in-service training.
- Trend 6: High-quality in-service training focuses on industry exposure, transversal and applied skills, and pedagogy as much as content.** The curricula used to train TVET teaching staff must be regularly updated to take into account the skills of the future. Transversal and applied skills such as problem-solving and collaboration need to be integral to curricula, and teachers and trainers need grounding in learner-centred pedagogy as much as content to build learners' practical and applied skills. The mode of delivery needs to incorporate industry exposure to develop teachers' and trainers' own practical skills and knowledge. Industry projects as part of training could be a powerful means of providing this.
- Trend 7: Responsive TVET systems ensure that TVET staff receive adequate training in gender responsive and inclusive methods.** To minimise the impacts of global disruptions on disadvantaged and vulnerable learners, TVET teaching staff require training in inclusive methods. They need to know how to deliver TVET using alternative (e.g., digital) formats and how to implement gender responsive/inclusive pedagogy, manage cultural/linguistic diversity and teach students with special needs. They also need training in educational psychology and labour rights to build learners' resilience and ability to cope in an increasingly competitive environment.
- Trend 8: TVET of the future relies on private sector as essential partner within in-service and CPD curriculum.** The private sector has core roles to play in both delivering TVET teaching staff training and creating value for it by certifying teachers' and trainers' skills and competencies. However, to engage the private sector in a practical and sustainable way, TVET teaching staff training must be aligned with the private sector's own interests. Examples of delivery models that could bring about such an integration include use of live industry projects and secondment of industry practitioners to training institutes as part of their career growth. Donors and higher education institutions also play important roles in increasing access to and enhancing the relevance of TVET teaching staff training.
- Trend 9: Effective stakeholder coordination is seen as a mechanism to improve coordination and quality of training and professional development of TVET staff.** Effective governance mechanisms enable coordinated action by public and private stakeholders across different levels (international, national, regional/local and sectoral) in objective setting, implementation, monitoring and review. However, stakeholder cooperation will only take place in a constructive and sustained manner if stakeholders understand each other's views and constraints and plan initiatives in a manner aligned with all of their interests.
- Trend 10: Mechanisms to engage TVET teaching staff are vital for aligning TVET systems to future skills needs.** TVET teaching staff, as the frontline of TVET delivery systems, have the most complete knowledge of the impacts of policies on TVET learners, as well as what training and support they themselves need to do their jobs and fulfil their career aspirations. TVET teaching staff should therefore be regularly consulted on the decisions that affect them. Strong communication channels between governments, TVET institutions and teaching staff can also lead to more effective policies and improve the responsiveness of TVET systems to evolving skills requirements.

Suggested actions for improving readiness of TVET Staff

These trends point to the global progress made in improving quality of TVET teaching and the remaining challenges in developing future-focused programmes. A set of recurring themes emerged during the study. These themes not only led to the identification of 10 trends but also offer guidance on actions that may improve countries' readiness for TVET teaching and learning of the future. Each of these actions need to be contextualized, at country and sectoral level, but they offer useful insights to improve the existing system.

- **National skills forecasting systems need to be developed such as to include communication channels for disseminating the results.** Making results of skills forecasts available to TVET institutions, teaching staff and learners allow for greater alignment between the world of training and local labour market. Most TVET practitioners participating in the survey reported that they rely on mass/social media to obtain information on the changes in world of work. This presents an interesting opportunity to disseminate the results of the skills forecast via online media.
- **Mechanisms to regularly assess TVET staff's skills and further training need to be strengthened. The findings can play a significant role in improving the quality of pre-service, in-service and professional development programmes.** These assessments when based on the results of skills forecasts, information and research obtained from the private sector and higher education institutions, and the findings of consultations held with staff significantly improve the quality of teaching and learning. These may be useful in developing/reforming pre-service as well as in-service training programmes for TVET staff, including managers.
- **Improve measures to engage the private sector in TVET systems, especially for training TVET staff.** Consultation with private sector firms may create reciprocal benefits. Governments and TVET institutions may evaluate the possibilities and implications of imposing a given length of industry experience as a formal entry requirement for staff positions, either as credit towards or in addition to pre-service training.
- **Developing a competency-based system linked to regular career growth encourages TVET staff to engage in continuous training and professional development.** Engaging the private sector in training and certification processes raises the relevance, recognition and portability of TVET teaching staff skills and competencies.
- **Training on Education for Sustainable Development, entrepreneurship and ICT have to be included in pre-service and in-service training programmes.** Training focus within these areas must also focus on transversal skills as well as subject-specific theories and concepts, and on pedagogical training aimed at developing learners' practical and applied skills.
- **Including components such as learner-centered pedagogy, transversal skills and inclusive methods improve teaching – learning outcomes.** Training programmes developing teachers' and trainers' transversal and applied skills, as well as knowledge of educational psychology and labour rights, have far-reaching benefits.
- **Strengthen governance and facilitate coordination among partners involved in in-service /pre-service training and professional development.** In determining the roles and functions of different partners, both their strengths and constraints should be taken into account. The devices used to facilitate coordination and the frequency of meetings should also reflect these characteristics.
- **Develop systems that regularly gather the views of TVET teaching staff, especially in relation to policies concerning their training and professional development.** TVET institutions should be responsible for collecting this data and passing it on to governments/ national bodies for aggregation and synthesis into policy.

Introduction

Background

Global disruptions – including climate change, digitalization, the Fourth Industrial Revolution, demographic change and migration – are having an unprecedented impact on our 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 competences to remain relevant in a rapidly changing labour market. These shifts in turn are changing not only the content and format of technical and vocational education and training (TVET) programmes, but also TVET teaching and training methods (both theoretical and practical).

Ongoing reforms have resulted in an expansion of support mechanisms for TVET teaching staff in many countries, specifically concerning new pedagogies, curricula and use of new technologies. However, given the sheer scale and speed of labour market shifts, training providers are often unable to keep pace or to offer holistic competencies that are future-oriented. Moreover, TVET teachers and trainers have to be motivated to acquire the necessary knowledge, skills, attitudes and values to remain current with sectoral and methodological changes.

In recent years, both topics – the future of work and the future of learning – have been widely researched and debated in the context of global disruptions.¹ However, 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. Existing research suggests that TVET teaching is in many cases not up-to-date, holistic or market-relevant.² However, we lack evidence on and insight into how TVET teaching and learning can be better organized and TVET teaching staff better supported to deliver the skills demanded in a rapidly changing and increasingly complex labour market.

As a first step to developing an actionable framework for improving TVET responsiveness to future skills needs through capacity development of TVET staff, UNESCO-UNEVOC commissioned a study to identify trends shaping the future of TVET teaching and learning.

Why focus on the future of TVET teaching?

UNESCO's 2015 Recommendation concerning technical and vocational education and training (TVET) states that TVET in all forms and settings should be oriented to equipping all

youth and adults with the 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 that teaching staff play 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, it 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 is not so straightforward given the unpredictability of changes taking place in the context of global disruptions. For example, at the time of writing the final report, the COVID-19 pandemic is disrupting everyday lives. It resulted in the closure of education and TVET institutions and leapfrogged the world into a new era of work. In countries, on the medium- to high-tech spectrum, work and learning moved online. In other places, on the low-tech and no-tech side of this spectrum, individuals without the infrastructure to participate in these processes struggled to remain in education and employment. Job losses resulting from the pandemic has led to historic unemployment in both developed and developing worlds. In many cases, the difference between remaining employed and becoming unemployed rests on workers' abilities to demonstrate entrepreneurial initiative and quickly reskill/ upskills themselves. In many countries, these shifts were previously taking place in response to the impacts of climate change, migration and digitalization, but the COVID-19 pandemic has rapidly accelerated these shifts. To prepare for and minimise the negative effects of these disruptions, educational institutions have to alter their content, formats and teaching/training methods. Delays in doing so might have long-term detrimental impact at individual, community and national levels.

Considering the current shifts taking place in methods of teaching and training, education systems and processes need to adapt in the context of these global disruptions. After all, studies³ show that social, economic and political shocks are becoming more frequent and intense over time, so TVET systems will need to become more future-focused, responsive and resilient to adequately support learners and economies. Furthermore, improving the future-readiness of TVET systems is crucial for assuring their relevance and, ultimately, their survival.

¹ See, for example, UK Commission for Employment and Skills (2014); and PwC (2018).

² See, for example, UNESCO (2016); and World Bank (2019).

³ See, for example, OECD (2011).

Objectives and methodology

The overall purpose of the study was to improve understanding of the implications of global disruptions and identify trends shaping the future of TVET teaching. Based on evidence gathered from the international TVET community, the study reviews global progress made and challenges still remaining in offering TVET teaching staff (teachers, trainers, instructors, facilitators, etc.) in public and private institutions with the knowledge, skills and competencies needed to prepare learners for the future of work. The study was conducted in several phases:

- In October 2019, a one-week virtual conference on ‘the future of TVET teaching and learning’ was held on UNESCO-UNEVOC’s TVeT Forum to 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. Topics discussed during the conference were informed by findings from the secondary literature and focused on three broad areas identified as crucial for new forms of work: education and training for sustainable development, ICT and digitalization, and entrepreneurship. The conference, which took place from 7 to 14 October 2019, was open to more than 6500 TVeT Forum members across 180 countries. The outcomes of the conference were captured in a summary report⁴. The inputs collected were used to develop the survey questions for the second phase of the study.
- In November 2019, a survey questionnaire⁵ was distributed to a wide range of TVET stakeholders targeting mainly three groups: governments/national bodies⁶, TVET institutions⁷ and TVET practitioners⁸ to collect information and insights on the current and future trends, as well as the shifts in the skills and training needs of TVET teaching staff. Survey questions were tailored to each target group, but in all cases sought to gather data on the following: (i) what systems are in place for tracking and disseminating information on future skills needs, as well as for feeding this information into TVET policies and programmes; (ii) progress made in supplying TVET teaching staff with the knowledge, skills and competencies needed to prepare learners for the future of work; (iii) persisting challenges in improving TVET responsiveness to future skills needs; and (iv) how far partnerships are mobilized to overcome these issues. Participants were also invited to share practices of their institutions in preparing teaching staff for the needs of future of work. In total, 87 participants from 56 countries answered the questionnaire⁹. Table 1 shows the number of responses received by sub-region and type of respondent.
- From April to May 2020, considering the shifts in teaching/training due to the COVID-19 pandemic, an online consultation with experts was organized as part of the peer review process. The group comprised of representatives from the three main stakeholders and offered their feedback on the draft manuscript and 10 trends identified by the study. The review process was led by the Centre for Teacher Accreditation (CENTA)¹⁰.

Table 1 – Regional breakdown of survey responses

Regions	Government/ National body	TVET institution	TVET practitioner	Total
Africa	6	8	8	22
Arab States	4	3	2	9
Asia and the Pacific	6	4	10	20
Europe, CIS and North America	7	14	7	28
Latin America and the Caribbean	2	5	1	8
Total	25	34	28	87

4 https://unevoc.unesco.org/pub/vc_synthesis_26.pdf

5 The questionnaire may be viewed at the following link: www.unevoc.unesco.org/I/669.

6 Including ministries, national bodies, associations of TVET providers, industry bodies, research institutes, etc.

7 Vocational training centres/schools, industrial training institutes/centres, private enterprises, teacher training institutes, etc. and through them private sector partners

8 Teachers, trainers, facilitators, instructors, master trainers, etc.

9 As stakeholder groups were not drawn from the same countries, this report’s findings are subject to error. However, findings were aggregated and cross-referenced to reduce the margin of error.

10 CENTA’s work focuses on making teaching an aspirational career by assessing and certifying the competencies of teachers, connecting them to a range of opportunities and supporting their professional development.

Structure of the report

The report highlights ten forward-looking trends that characterize high-quality, future-focused TVET systems. The trends are structured as follows:

- **Trend 1** explores the skills that workers require for future work. Its findings underscore the need for further action to improve quality of TVET teaching.
- **Trends 2 and 3** examine the key characteristics of future-focused TVET systems. Trend 2 captures the need for continuously updated information on future skills requirements, while Trend 3 highlights the importance of TVET teaching staff being trained and supported to deliver training meeting these requirements.

- **Trends 4 to 10** examine various aspects of the training and support required by TVET teaching staff, including models for pre-service and in-service training (Trends 4 and 5), the focus of in-service training (Trends 6 and 7), the role of partners (especially the private sector) in supporting TVET systems (Trend 8), and the need for robust mechanisms to facilitate coordination and cooperation among TVET stakeholders (Trends 9 and 10).

The 10 trends identified by this study are based mainly on the findings of the survey questionnaire and practices shared by the TVeT Community during the virtual conference. Therefore, where helpful, virtual conference discussions, inputs from the peer review process, and findings from the secondary literature are used to supplement evidence gathered from the surveys.

Ten trends shaping the future of TVET teaching

Trend 1: As digitalization and automation are changing the world of work, demand for transversal and applied skills are most likely to grow in next 10 years

27% of survey respondents consider growth in ICT/digitalization as the biggest change to have occurred in the world of work over the past 5 years. Experts believe that while TVET will continue to evolve, skilled workers need to prepare for new requirements, most importantly cross-functional and core general skills such as problem-solving, communication and social and emotional skills.

The spread of new technologies, automation and other changes taking place in the world of work are redefining how skills workers shall remain productive. While traditional sectoral or occupation specific skills will continue to play an important role in the workplace of the future, demand for new knowledge, transversal skills (such as problem-solving and learning-to-learn) and cross-occupational competencies such as entrepreneurship will grow exponentially.

When asked what the biggest changes that have occurred in the world of work over the past five years were, both institutional representatives and TVET practitioners, identified the same four factors (see [Table 2](#)):

- Growing use of information and communications technologies (ICT) and digitalization
- Rapid technological change (broadly defined)
- Increased automation
- Greater focus on sustainability and use of renewable and energy efficient processes in the workplace

The respondents also highlighted the implications of these changes on workers – in particular, greater job insecurity and a higher demand for skilled workers.

Participants of the virtual conference also suggested similar conclusions when asked about the most noticeable changes in workplace organization and practices in the past three years. Participants highlighted that technological advancement and heightened competition have transformed the way work is being/will be organized. This in turn has accelerated the demand for new skills from the employers, especially higher-level skills, and decreased the demand for lower-level skills. Some also suggested that the growing skills mismatch has resulted in growing competition for jobs, even among highly skilled and experienced workers.

As the Fourth Industrial Revolution builds on the third (digital revolution), transitions to technologies such as artificial intelligence, robotics and the Internet of Things are likely to have a major impact on businesses and individuals, lowering the barriers to wealth creation and altering professional environments (Schwab, 2016). The disruptions caused by the Fourth Industrial Revolution present difficult challenges, yet this new era offers countries the opportunity for rapid growth and development so long as countries provide their labour forces with the skills, values and attitudes required for the future (World Economic Forum, 2017). Recent research suggests that interventions that build workers' resilience and adaptability are particularly crucial given trends such

Table 2 – Three biggest changes that have occurred in the world of work over the past 5 years

Survey responses	TVET institutions	%	TVET practitioners	%
First biggest change	Growth in ICT/digitalization	27%	Growth in ICT/digitalization	24%
Second biggest change	Rapid technological change	16%	Rapid technological change	19%
Third biggest change	Increased automation	10%	Greater focus on sustainability	14%
Other popular responses	Greater focus on sustainability	8%	Increased automation	10%
	Jobs more precarious/insecure	8%	Higher demand for skilled workers	10%
Proportion of all responses received		29%		76%

as increased automation, which are rendering some jobs obsolete while creating new work opportunities requiring new or higher-level skills, and the increased frequency and severity of global shocks and disruptive events, such as the current COVID-19 pandemic (OECD, 2019; OECD, 2011).

The main characteristics of the skills needed for the most valuable jobs of the future are that they are transversal (not linked to a specific field), multidimensional (encompassing knowledge, skills, values and attitudes) and higher-level (representing the ability to cope with complex problems and unpredictable situations). In terms of what skills and characteristics are likely to be most important over the next decade, all three-stakeholder groups responding to the survey (see Table 3)¹¹ identified the following as most crucial:

- Problem-solving/Critical thinking skills
- Digital/ICT skills
- Entrepreneurship/Creativity skills
- Teamwork/Collaboration skills
- STEM (science, technology, engineering and mathematics) skills

Having specific technical skills and a general understanding of their sector/occupation was also deemed important for workers, although less critical than transversal and applied skills.

Participants of the virtual conference agreed that workers will continue to require specialized skills and knowledge, but emphasized the importance of their being able to apply their skills and knowledge to new situations to add value and remain competitive. In this context, workers with practical skills and work-based experience are and will continue to be preferred by employers.

Training on ICT/digital and 3D technologies for TVET Teachers and Trainers

Russian Federation

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.

All participants considered a lifelong learning mindset as necessary for acquiring/upgrading to new skills and remaining relevant for the rapidly changing work environment. As a virtual conference participant from Germany pointed out: 'you can't train people for jobs that don't exist yet, but you can prepare them to cope with changes and to be able and willing to learn every day.' They also suggest that socio-emotional skills such as empathy, self-regulation, listening skills are increasingly valued in the workplace.

¹¹ Respondents were asked to report information they had received through national skills forecasts or other sources of labour market intelligence.

Table 3 – Five most important skills/characteristics for workers to have over the next 10 years

Survey responses	Governments/ National bodies	%	TVET institutions	%	TVET practitioners	%
First most important	Problem-solving/ Critical thinking skills	16%	Problem-solving/ Critical thinking skills	17%	Problem-solving/ Critical thinking skills	16%
Second most important	Digital/ICT skills	14%	Digital/ICT skills	16%	Digital/ICT skills	14%
Third most important	STEM skills	12%	Entrepreneurship/ Creativity skills	15%	Entrepreneurship/ Creativity skills	14%
Fourth most important	Entrepreneurship/ Creativity skills	11%	Teamwork/ Collaboration skills	11%	Teamwork/ Collaboration skills	14%
Fifth most important	Specific technical skills	10%	STEM skills	10%	Specific technical skills	9%
	General understanding of sector/occupation	10%				
Proportion of all responses received		73%		69%		67%

The findings are reflective of wider discussions taking place nationally and globally on what skills are required for the future of work. Various agencies, including UNESCO, have developed frameworks outlining what 21st century skills workers need as technologies evolve and countries transition to knowledge-based economies, in which the ability to store, analyse and share knowledge through networks and communities are expected to become key determinants of economic success (Brinkley, 2006). All of these frameworks emphasize the importance of the following competencies, in addition to traditional skills: the ability to communicate,

collaborate, innovate and solve problems, as well as ICT-related skills and social/cultural awareness (Voogt and Roblin, 2012). However, even less valued, repetitive jobs requiring lower-level skills will require a different set of skills in line with new focus areas and new technologies.

In other words, all workers will require further education and training to remain productive in a rapidly changing work context. These findings reiterate the need for an actionable framework at country-level to improve responsiveness of TVET systems to future skills needs.

Trend 2: Collection and dissemination of data on emerging skills for planning is becoming critical for future-oriented TVET programmes

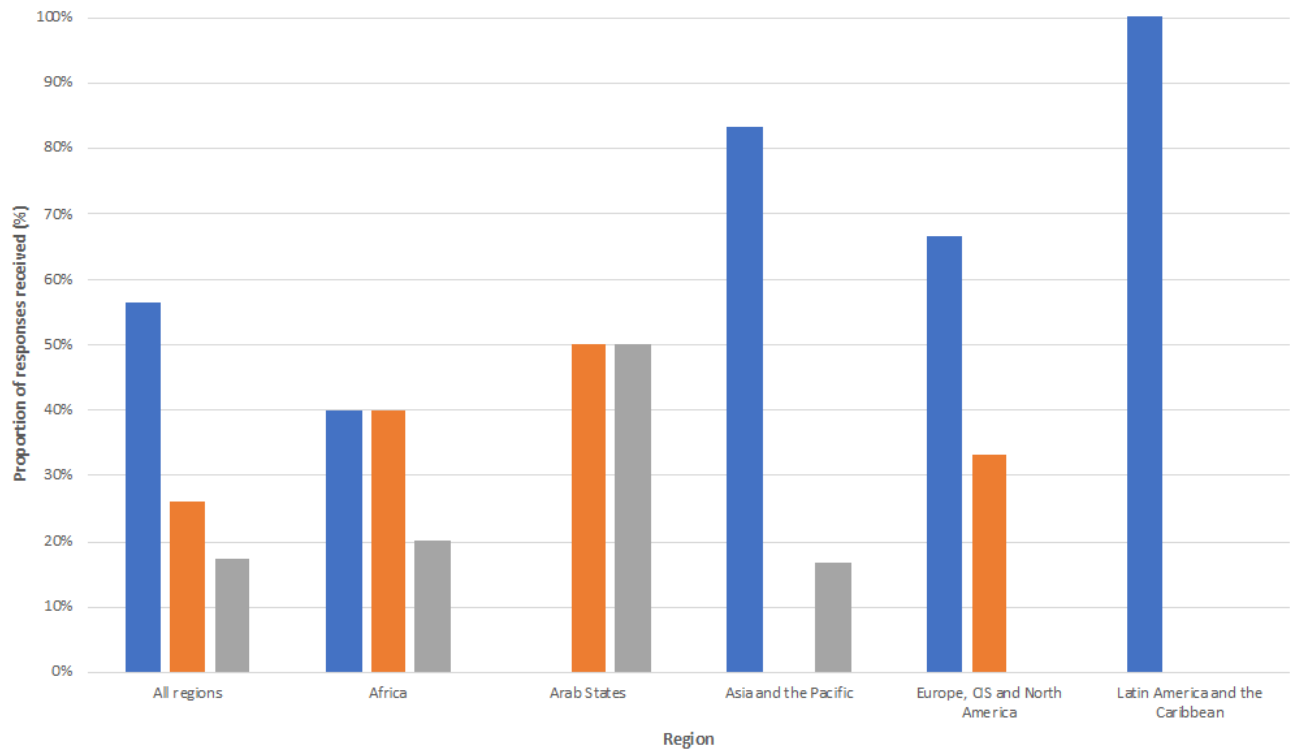
83% of countries covered by the survey have or are developing national skills forecasting systems; only 10% report that the results are made available to TVET institutions or practitioners. Forward-looking TVET systems actively engage the private sector in their data-gathering exercises, at national and local levels, which improves the readiness and relevance of skills provision.

TVET systems need accurate and continuously updated information on what skills requirements of future are. They can achieve this by leveraging a range of sources, maintaining data on future skill needs, and ensuring that this information is systematically passed on to TVET institutions and most importantly TVET staff. The most important source of information on current and evolving skills needs is the private sector, and forward-looking TVET systems actively engage the private sector in their data-gathering exercises,

both at the national level – for example, through conducting skills forecasts – and at the local level, by involving industry actors in TVET processes and activities.

To assess the extent to which data on future skills needs is collected at national level, survey respondents representing governments or national bodies were asked if skills forecasts are regularly conducted in their country. Their responses show that more than half of countries covered by the survey

Figure 1 - Does your country regularly conduct national skills forecasts?



regularly conduct skills forecasts (see Figure 1). Although most of the remaining countries are in the process of developing national skills forecasting systems, one-sixth of countries – all developing countries – currently lack systems and plans to develop systems for tracking future skills needs.

While the proportion of countries that regularly collect data on future skills needs may seem low, evidence suggests that their numbers have been growing and will continue to grow. For example, in 2015 a review of Asia-Pacific countries' policies for improving TVET relevance found that only a minority of countries in that region regularly conducted skills forecasts or mapping exercises (UNESCO, 2016). Yet the bulk (83%) of respondents to the trends study from Asia-Pacific suggest that national skills forecasts are regularly conducted in their country. Given the importance of forecasting systems, many countries in other regions are in the process of developing national skills forecasting systems.

To assess the extent to which countries collect data on new skills required for emerging areas of work, survey respondents who had indicated that their country regularly conducts skills forecasts were asked whether these forecasts pay explicit attention to the new skills required in a green economy, a digital economy and/or a knowledge economy. Their responses suggest that most countries collect data on the new skills required in a digital economy (in 92% of cases) or a green economy (77% of cases). However, in only 54% of cases – predominantly in high- or upper-middle income countries – do national skills forecasts pay attention to the new skills required in a knowledge economy (see Figure 2). Since knowledge-based skills are key for capitalising on the

Offering foundational and language skills to master trainers/trainers

India

Additional Skill Acquisition Programme (ASAP) is a ADB funded project which offers training in foundation skills, domain skills and industry internships to nearly 30,000 engineering students every year connected to 121 Skill Development Centres in the state of Kerala, India. In contrast to the conventional input centric teaching methods, ASAP utilized the skills forecasting studies to develop an outcome centric, learner focused, activity-based and experiential methodology.

The uniqueness of the programme is that trainers on the ASAP pool undergo training on technologies and tools similar to the potential trainee. This prepares the TVET staff to train students on new technologies and requirements easily. The Life Skills/Core Skills module is also an example. It intends to prepare both learners and trainers to become innovative, entrepreneurial and get better at problem solving. By aligning its courses to the changes in the job market, ASAP offers Training of Trainers programme to final year graduates and post-graduate students. This also encourages them to join the teaching/training profession.

Read more: <http://asapkerala.gov.in/about-us/>

Fourth Industrial Revolution (Unger, 2019), countries that do not take steps to target and develop these skills run the risk of lagging behind those that do.

These findings point to two main conclusions within this Trend, First, dissemination channels for transmitting data on future skills needs tend to be weak, both between governments and TVET institutions and between TVET institutions and practitioners. Only 11% of the institutional representatives surveyed reported obtaining information on changes taking place in the world of work from their governments, while only 5% of TVET practitioners surveyed reported receiving this information from their institutions (see Figure 2). Second, both groups' reliance on mass or social media for information regarding changes taking place in the world of work raises potential issues concerning the reliability of the information they receive, particularly in the case of social media.

In a surprising contrast, despite limited availability of national-level data on future skills needs, the bulk of TVET institutions and practitioners surveyed reported having regular access to information regarding changes taking place in the world of work (see Figure 3). An explanation for this is that most institutions and practitioners do not obtain this information from their governments. Instead, TVET institutions mainly obtain this data by attending conferences or liaising with industry contacts, while TVET practitioners rely heavily on mass or social media.

Figure 3 – Do you have regular access to information regarding changes taking place in the world of work?

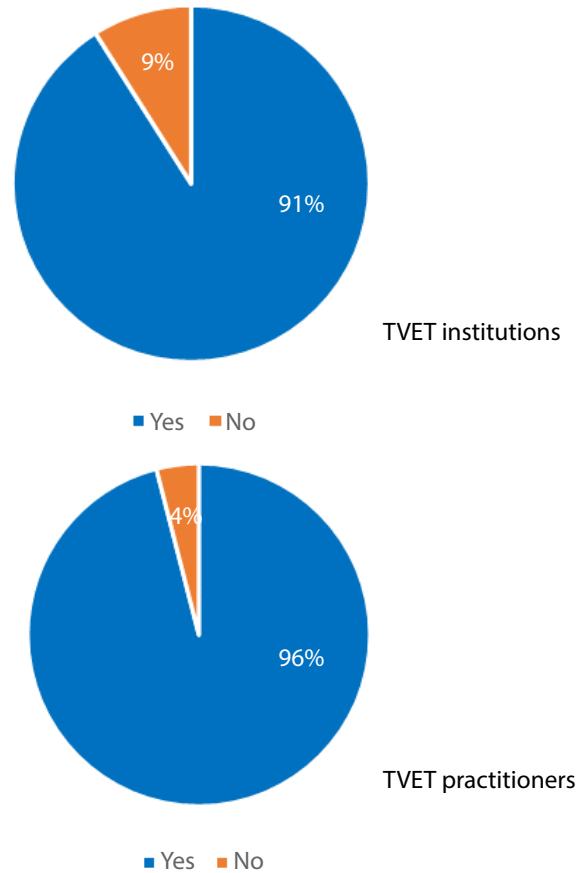
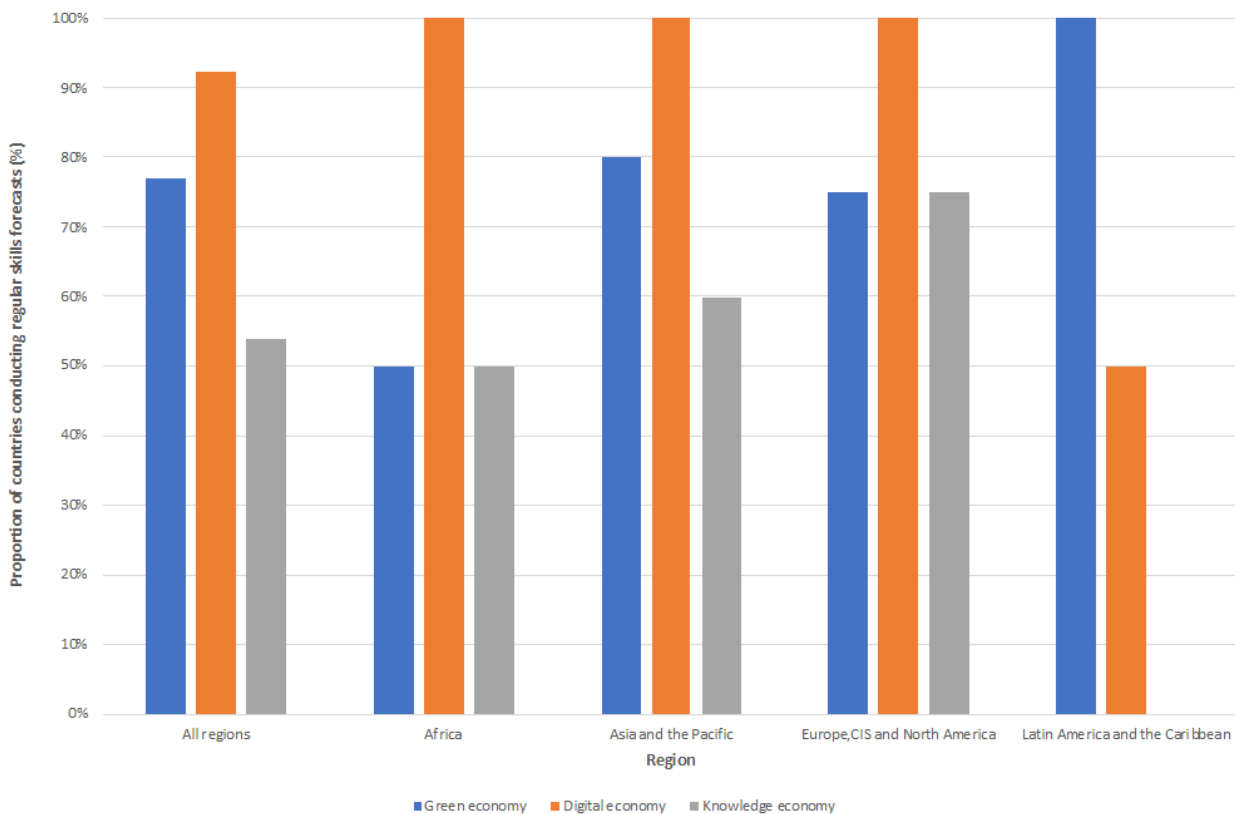


Figure 2 - Extent to which countries' skills forecasts focus on new skills required in emerging areas



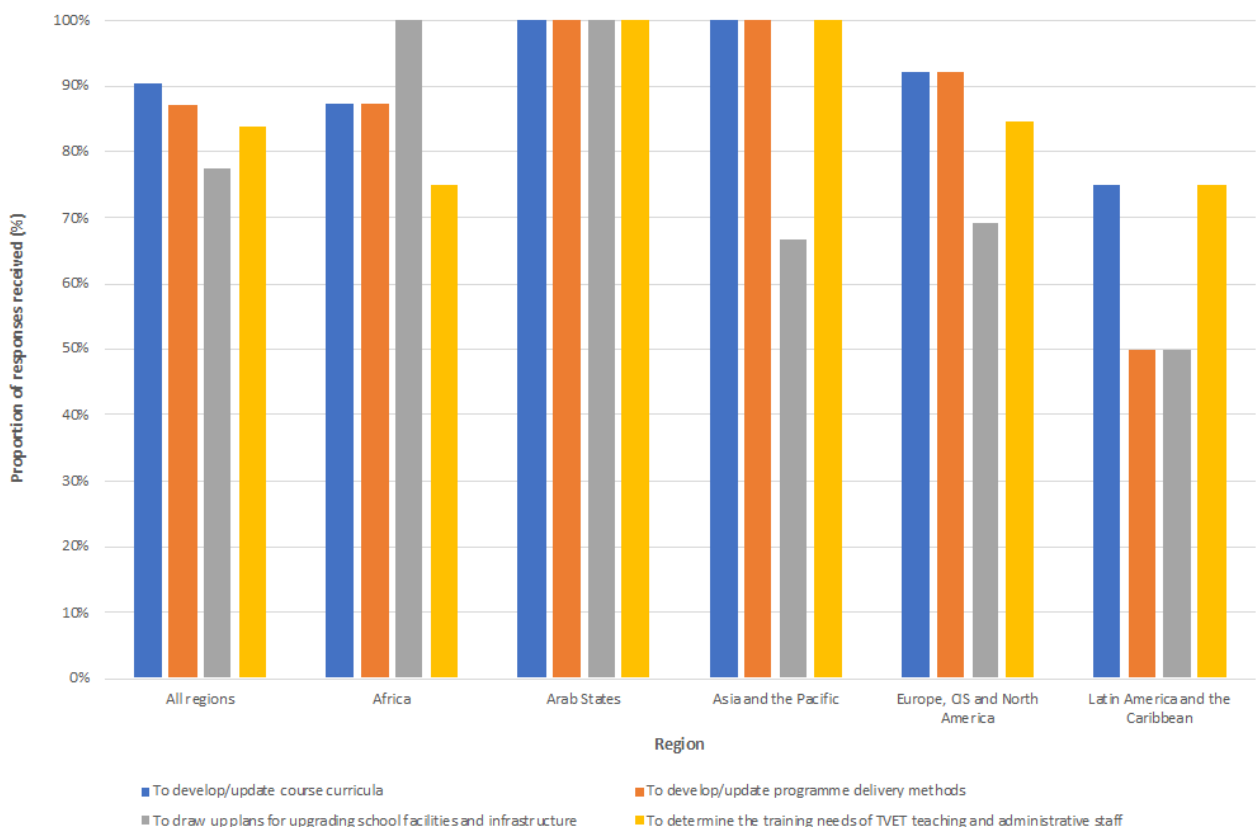
Data on future skills needs will not have a measurable impact on learners’ preparedness for and abilities to shape the future world of work unless it is fed into TVET policies and programmes. Ensuring that education systems deliver the correct level, types and mix of skills can be a powerful means of boosting individuals’ ability to adapt to change as well as contribute to change (Bokova and Figueres, 2015). For this reason, national- and institutional-level respondents participating in the trends mapping survey were asked whether the information they obtain on future skills requirements is used to develop and/or reform TVET policies and programmes. Both groups’ responses were positive. As seen in Figure 4, based on the responses of the national-level participants:

- Nearly every country (92%) that conduct skills forecasts use the data to develop and/or reform TVET policies and programmes
- 41% use the data to revise or create curricula to meet the current and future needs of employers
- 29% carrying out reviews of their TVET system to assess whether policies and programmes meet changing work requirements
- 18% upgrade their qualifications systems; and/or 12% use the results of skills forecasts to determine funding priorities

Most institutional representatives likewise said that information obtained on changes taking place in the world of work is used to develop and/or update course curricula (in 90% of cases), revise programme delivery methods (87% of cases), assess the training needs of teaching and administrative staff (84% of cases), and/or upgrade school facilities and infrastructure (77% of cases).

The two groups’ responses suggest that the most popular means of responding to new information on future skills needs, between both national- and institutional-level actors, is to adjust the content of TVET programmes. Less attention is paid to pedagogical aspects – that is, how programmes are taught and what training TVET teaching staff need to develop learners’ future-oriented skills and competencies. Yet how subjects are taught have as much of an impact as the content of programmes on the knowledge, skills and competencies that learners acquire, especially given the expectation that transversal and applied skills such as problem solving and collaboration will be more highly demanded in future than specific technical skills.

Figure 4 - How does your institution use information obtained on changes taking place in the world of work?



Trend 3: Results of skills assessment are being used to develop in-service and not so much to reform pre-service training

80% of countries use some form of skills and training needs assessments to develop and/or reform in-service training programmes. In most cases (less than 50%), however, the results are not used to develop/reform pre-service training programmes. Future-focused TVET systems ensure that TVET staff receives the training and support they need to deliver the skills of the future throughout their career.

TVET staff play a crucial role in supplying the knowledge, skills, values and attitudes that learners need to thrive in a world in constant flux (European Commission, 2018). As Trend 1 and Trend 2 suggested, as the speed of change increases and the world becomes more complex and interconnected, the demands on TVET staff are also growing. They are expected to pass on future-oriented competencies to learners and promote a culture of lifelong learning. To do so, TVET teaching staff need to first possess these competencies and qualities themselves.

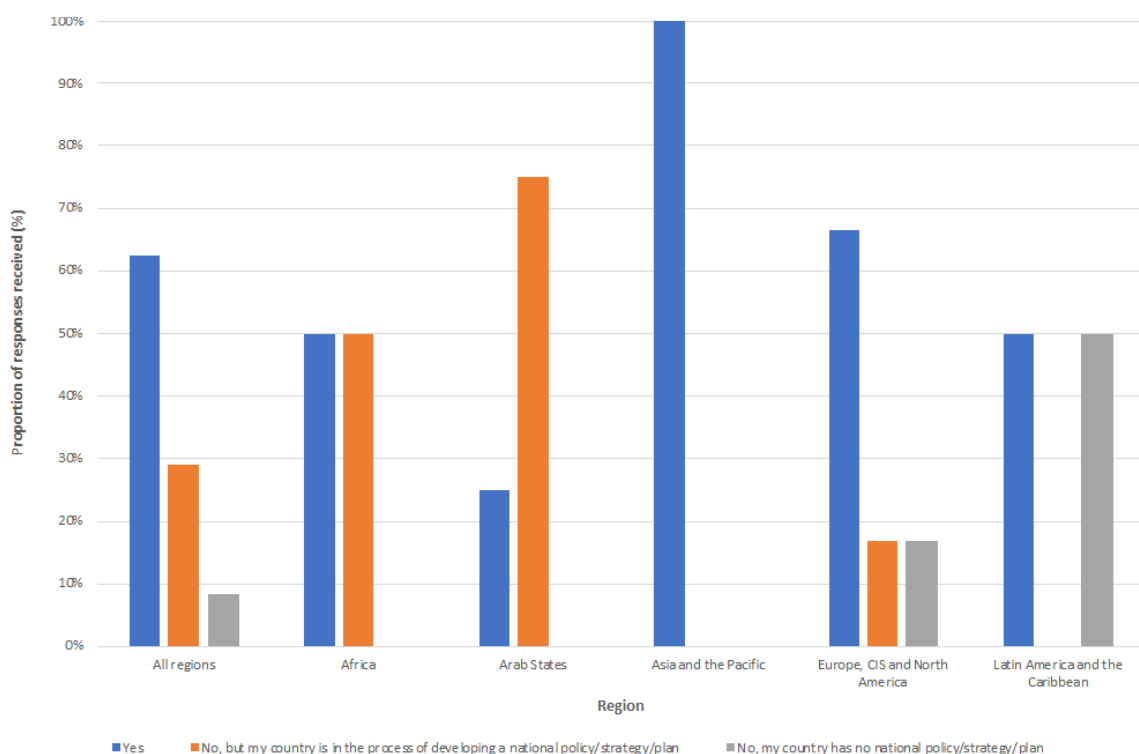
To fulfil these high expectations, they require strong training and support – from their employing institution, the private sector and government. Information on changes occurring in the world of work and guidance on how to respond to these changes needs to reach them so they can modify what they teach and how they teach it. They need training to upgrade their own knowledge and skills to understand new workplace practices and technologies, and to adopt new teaching and learning approaches to meet the evolving needs of learners. Furthermore, the right set of incentives need to be offered to encourage them to engage in training and professional development.

Future-focused TVET systems ensure that TVET staff receive the training and support they need to deliver the skills of the future. They do so by:

- Developing policies and frameworks that define what qualifications and competencies staff require, as well as what actions are needed to support staff in acquiring these
- Regularly assessing TVET staff's skills requirements and further training needs in light of changes taking place in the world of work and learning
- Using the assessment results to develop and/or reform training programmes for TVET staff so that the training they receive is relevant and future-oriented

The survey results suggest that most countries either have or are in the process of developing national policies, strategies or plans relating to the pre-service and/or in-service training of TVET staff. According to respondents from government and national bodies, it is encouraging to note that around two-thirds of countries represented in the survey already have frameworks in place relating to the pre-service and/or in-service training of TVET staff; while most other countries are in the process of developing a national policy, strategy or plan (see Figure 5). Although only 41% of government/national

Figure 5 - Does your country have a national policy/strategy/plan relating to the pre-service and/or in-service training of TVET teaching staff in public and/or private TVET institutions?



body representatives surveyed said that their country regularly assesses TVET teaching staff's skills and training needs, a further 41% said that their country is in the process of developing systems to do this.

Likewise, most countries and TVET institutions either already have systems in place or are developing systems to regularly assess staff's skills requirements and further training needs. TVET institutions seem to play a much larger role than governments or national bodies in monitoring the training needs of TVET teaching staff. Over 90% of institutional survey respondents said that their institution regularly collects and assesses data on TVET teaching staff's skills requirements and further training needs.

Respondents who said that their country/institution regularly collects and assesses data on TVET teaching staff's skills requirements and further training needs were asked whether the results of these assessments are used to develop and/or reform pre-service and/or in-service training programmes for TVET teaching staff. According to both the government/national body and institutional representatives surveyed, the results of these assessments are often used to develop and/or reform in-service training programmes, but in most cases

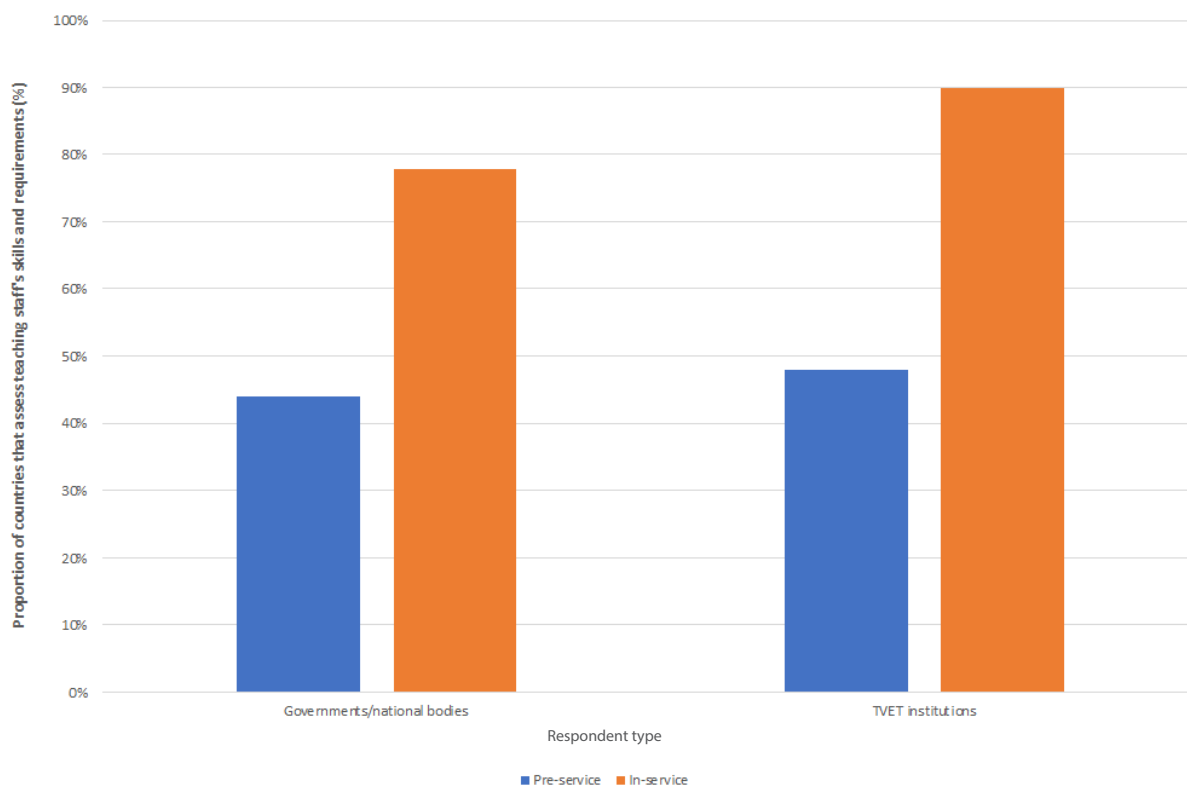


'Emphasize the importance of the practice and application of knowledge to students. Always strike a balance between theoretical and practical!'

Liu Chang, Teacher, Zhejiang Technical Institute of Economics, People's Republic of China

not pre-service training programmes (see Figure 6). Given the pivotal role that pre-service training plays in improving education systems' responsiveness by enabling critical assessment of traditional approaches to teaching and learning, this trend suggests room for improvements remain.

Figure 6 - Are the results of these assessments used to develop and/or reform any of the following types of training programmes for TVET teaching staff?



Trend 4: Future-focused TVET systems value industry experience and exposure as part of pre-service training

Only 30% of TVET institutions surveyed require new secondary-level TVET teaching staff to have industry experience. Experts see industry experience as the most important component of pre-service training for TVET teaching staff and even plan for career paths integrated between industry and TVET teaching. TVET staff of the future may even be industry practitioners.

The survey suggests a trend that pre-service training is not compulsory for secondary-level TVET teaching staff in many countries, including 30% of the countries represented in the trends mapping survey (see Figure 7). Half of TVET practitioners responding to the survey said they did not have to undergo pre-service training prior to taking up their first TVET teaching post. These findings are in line with trends observed elsewhere. For example, a recent ILO report noted that “pre-service programmes for teachers and instructors are not always in place in low- and lower middle-income countries” (Rawkins, 2018). It also reported “the erosion of requirements for pre-service training occurring in some countries in the name of cost-efficiency following the 2008 financial crisis”.

Even where it is offered, the length of pre-service training that most TVET teaching staff receive tends to be shorter than most countries’ policies stipulate (see Figure 8). Half of TVET practitioners responding to the survey reported receiving less than 6 months of pre-service training, despite nearly two-thirds of government/national body representatives stating that the duration of compulsory pre-service training for secondary-level TVET teaching staff in their country is

12 months or more. This discrepancy suggests a lack of enforcement of training regulations. For example, in Kenya, where all three stakeholder groups responded to this survey question, the National TVET Authority representative said that secondary-level TVET teaching staff should receive 12-18 months of pre-service training, while three separate institutional and practitioner survey respondents reported TVET teaching staff receiving pre-service training of 6-12 months.

The duration of pre-service training matters, since it affects teacher readiness and thus teaching quality. While it is generally acknowledged that the quality of pre-service training depends more on programmes’ content, structure and support than on their duration, studies nevertheless show that “graduates of short duration [pre-service training] programmes (e.g., 2-10 weeks) will likely need substantially more in-service support than graduates of long duration programs (e.g., 2-5 years)” (IIEP, 2018).

The importance of pre-service training has been emphasized both by the participants of the VC and respondents of the survey. A virtual conference participant said, ‘in simple terms

Figure 7 - Is pre-service training compulsory for secondary-level TVET teaching staff in your country? Did you have to undergo pre-service training before taking up your first TVET teaching post?

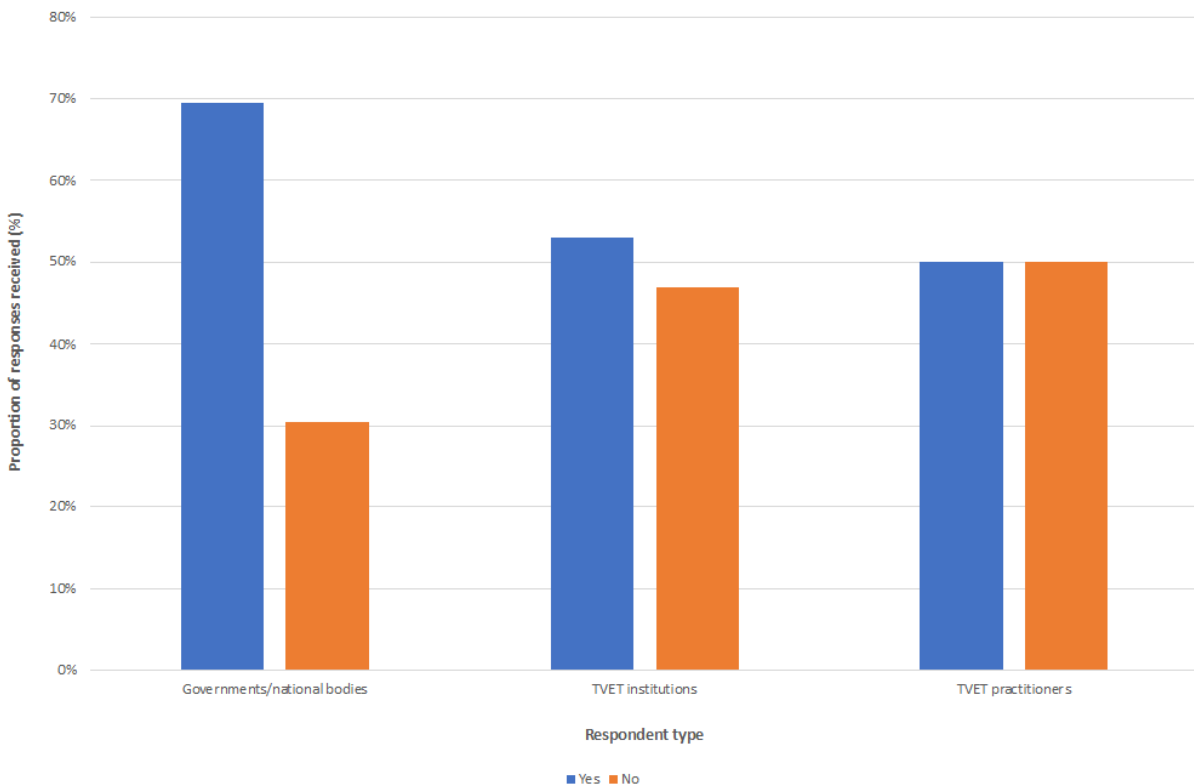
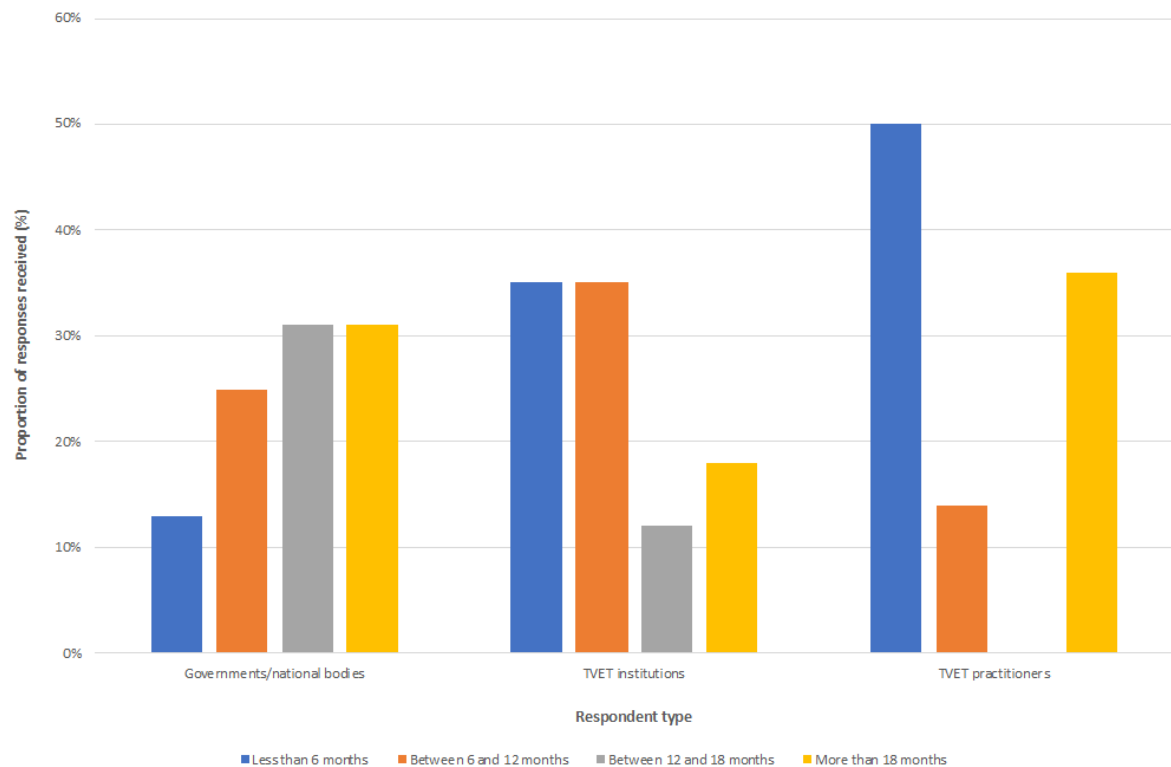


Figure 8 - What is the duration of pre-service training for secondary-level TVET teaching staff in your country/ joining your institution? What was the duration of your pre-service training?



pre-service training is the building block of the profession. It offers teachers and trainers the capacities to self-organise, combine practical and theoretical aspects of teaching and practice multidisciplinary teamwork. The participant further mentioned that, pre-service trainings is an excellent opportunity for many teachers and trainers, especially the young and new ones, to:

- Develop professional skills in vocational pedagogy and didactics
- Use of tools and media in classroom and at workshops
- Select and master the subject - both theoretical and practical aspects
- Communicate better with students, teachers, employers, unions, etc.
- Familiarize with non-instructional aspects such as TVET administration, network creation and management, guidance and counselling, etc."

Pre-service training is considered to be crucial for providing teachers with the foundational skills they need to develop learners' 21st century skills (National Research Council, 2010). One of the main challenge, however, is that the content of most pre-service training programmes for TVET teaching staff tends to be traditional rather than future-oriented. Most pre-service training programmes for secondary-level TVET teaching staff focus on building teachers' and trainers'

Engaging partners to develop future-focused pre-service training

Sri Lanka

Sri Lanka's University of Vocational Technology (UNIVOTEC) offers pre-service TVET teaching staff training leading to a Bachelor of Education in Technology. This three-year full-time course combines theoretical and practical training, and involves partnerships with the private sector as well as between departments in the university. During the first half of the course, pre-service teachers take courses in technology degree programmes pertaining to their subject field. The second half of the course is run by the Department of Education and Training and includes modules in educational psychology, research methods, and instructional media.

The final semester of the course is devoted to industrial training and project work. Pre-service teaching staff are first placed in an industry to gain exposure relating to their technology area. They then take part in a group project, in which they work in teams to design and implement a solution to a challenging engineering problem, applying realistic constraints and engineering standards. These final modules are supervised and assessed by their two faculties, with the support of industry experts.

Read more: <http://univotec.ac.lk/wp-content/uploads/2016/06/Bachelor-of-Education-in-Technology->

knowledge and understanding of their subject field as well as their general pedagogical competencies (see Figure 9). In most cases these programmes do not develop teachers' and trainers' professional knowledge and skills in relation to new skills, knowledge, practices, technologies at the workplace. Therefore, in most cases pre-service training is unlikely to prompt teachers/trainers to question the status quo of what is taught, how it is taught, or to integrate future-focused elements into the training they provide to TVET learners.

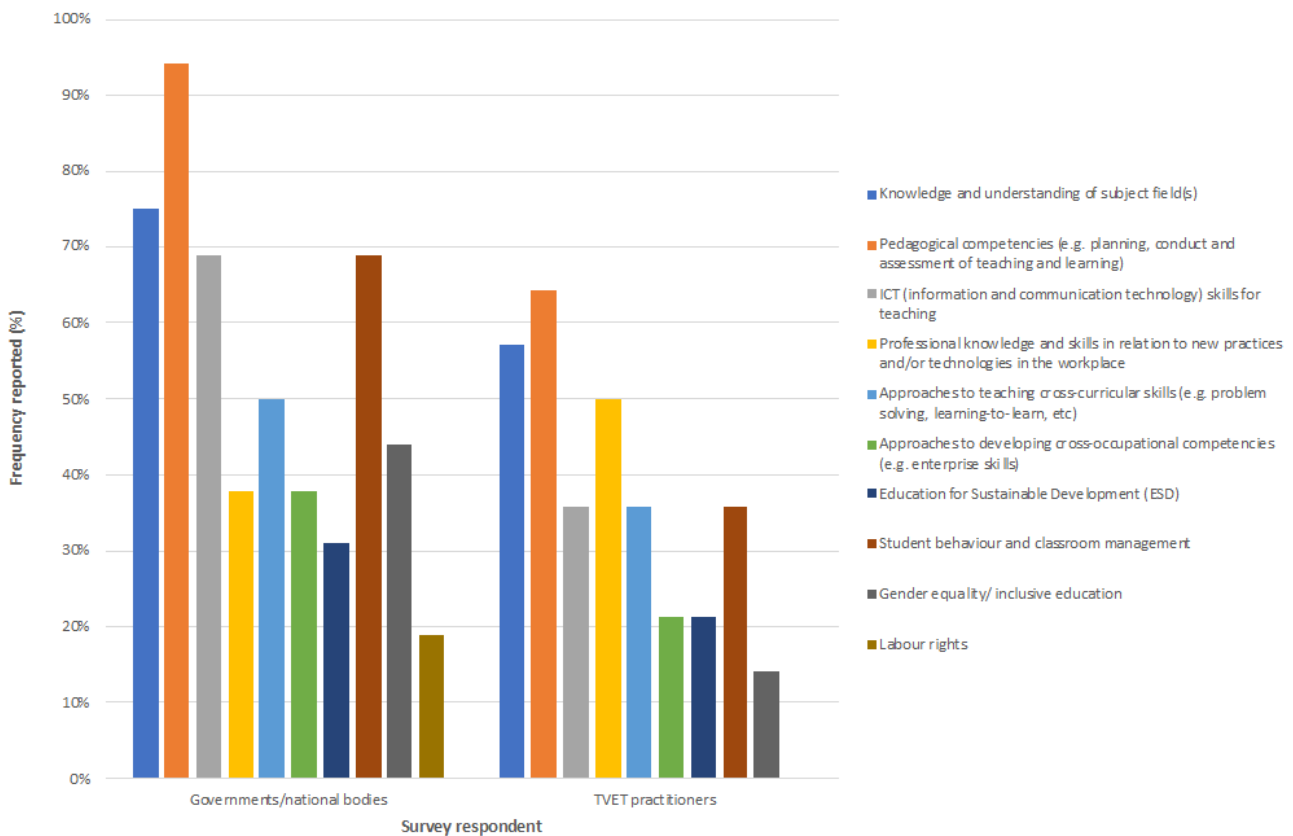
Interestingly, the main reasons given by survey respondents for why pre-service training is not a requirement in their countries was not lack of funds or a lack of awareness of the usefulness of pre-service training, but instead a lack of systems and/or trained staff with the relevant knowledge and expertise to deliver the training (see Figure 10). This finding somewhat diverges from the conclusions of the aforementioned ILO study, which attributed deficits in pre-service training to a lack of funds, but also noted that "[i]ncreasingly, developed countries, NGOs and development banks are working with developing countries to train quality TVET staff" (Rawkins, 2018). This likely explains the trend as to why funding is now considered less of a barrier to offering pre-service training, but also points to technical assistance as one possible solution.

Quality pre-service teaching staff training through SINO - ZAMBIA partnership

People's Republic of China

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.

Figure 9 - Which of the following areas are taught in pre-service training programmes for secondary-level TVET teaching staff in your country? Which of the following were taught during your pre-service training?



Another –more powerful – solution for providing quality, relevant and future-oriented pre-service training to TVET teaching staff is to require teachers/trainers to have industry experience of a given length. This would overcome the barriers of both lack of training systems and lack of trained staff with relevant knowledge and expertise, while improving teachers'/trainers' acquisition of practical skills and professional knowledge and skills in relation to new practices

and/or technologies in the workplace. However, according to responses to the trends mapping survey, industry experience is not a formal entry requirement for secondary-level TVET teaching staff in most countries and TVET institutions (see Figure 11). Instead, the emphasis is on teachers/trainers having specialist qualifications in form of subject-matter diplomas and degrees.

Figure 10 - Why is pre-service training not a requirement?

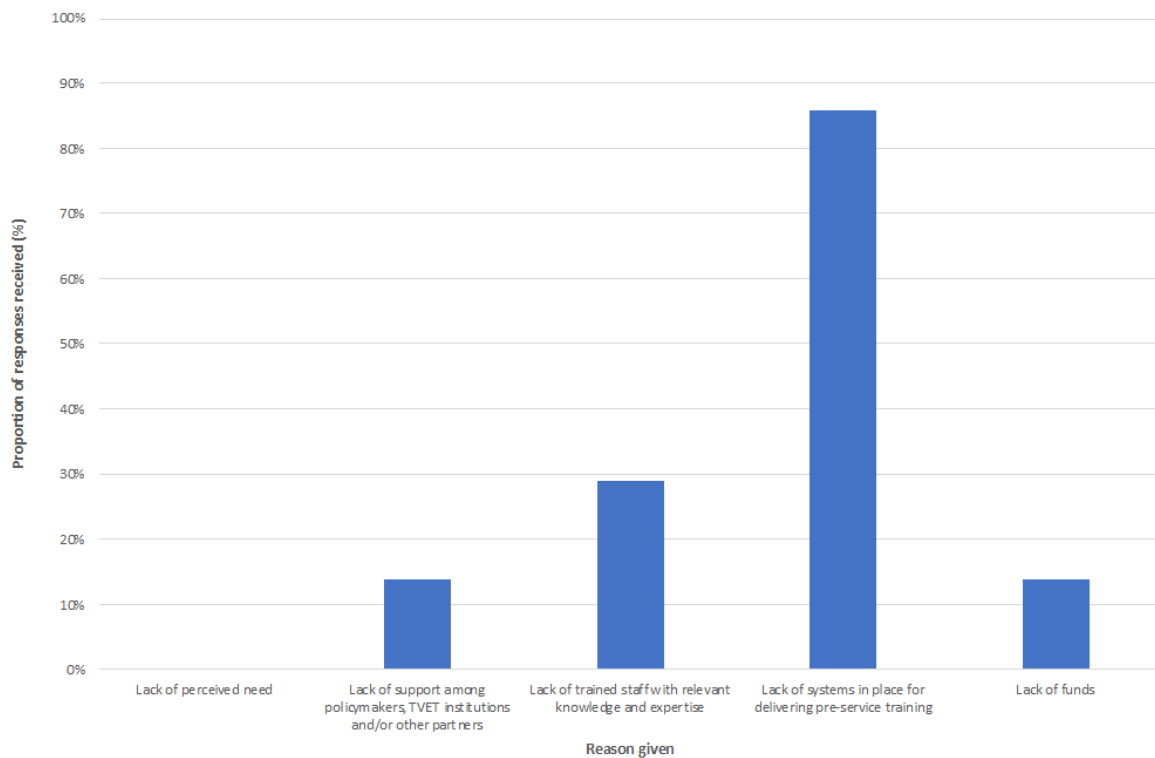
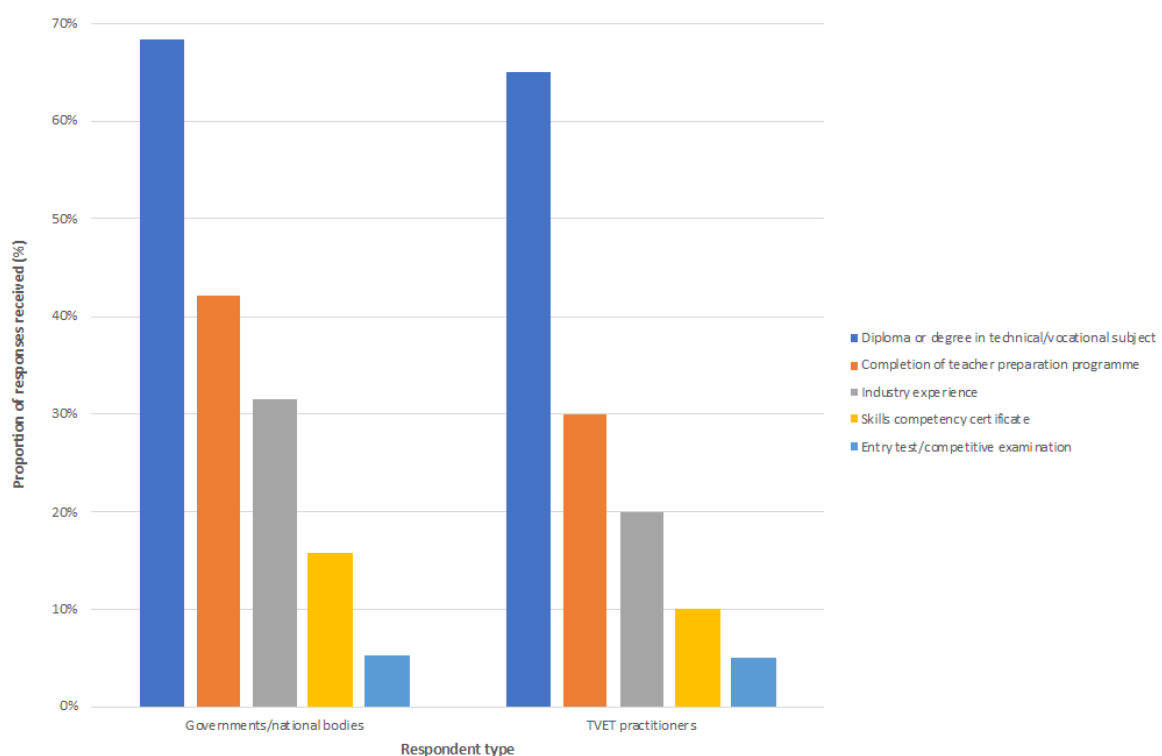


Figure 11 - What are the formal entry requirements for secondary-level TVET teaching staff in your country/institution?



Investing in academic courses leading to a qualification is no longer enough to build the skills of the future TVET teacher/trainer. Industry experience and exposure to new tools/technologies through live projects is equally important needed to provide them with the skills they need to develop learners' skills. At the same time, TVET teachers/trainers need grounding in learner-centred pedagogy, approaches, new age competencies and emerging skills in topics such as ESD and ICT.

This aligns with the inputs offered by the panel of experts who reviewed the trends and main findings of the study. They suggested two possible approaches for incorporating industry experience and/or exposure into pre-service training systems. The first approach would be to make industry experience a pre-requisite for enrolment in pre-service training. In this model, TVET teachers/trainers would be professionals with at

least two years' industry experience who go through pre-service training covering teaching aspects as well as subject-specific content. The second approach would be to create a career path, in which 'junior trainers' enrolled in pre-service training courses are provided with industry exposure, guided by 'master trainers' with at least 2-3 years' industry experience who have undergone pre-service training covering teaching aspects. In this model, industry practitioners could enrol in master trainer courses and pursue an integrated career spanning industry and TVET teaching. Such a system would not only strengthen linkages between TVET institutions and industry, but also ensure that TVET programmes are continuously updated to reflect changes in work practices, technologies and equipment. However, greater government commitment and stronger system-level design is crucial for making this work.

Trend 5: Linking in-service training to career progression increases the TVET staffs openness to adopting new methods of teaching and learning

About 60% of the surveyed TVET institutions seem to offer financial incentives such as training budgets, while less than 50% offer teaching staff opportunities to gain a certificate or additional qualification even though this is valued more by teaching staff. Two-thirds of the surveyed practitioners value incentives in form of institutional sponsorships and other financial incentives to undertake continued professional development.

Continued professional development (CPD) enables TVET teaching staff to verify and upgrade their skills and competencies. It allows them to reflect on their practices and learning requirements, and keeps them up to date with new developments in their field. This is especially important in the context of disruptions, since skills requirements are likely to rapidly evolve during the career span. CPD is the key to addressing gaps in initial training and in providing a framework for TVET teaching staff to build a career. Furthermore, investments in high-quality CPD have been shown to have a greater positive impact on student learning outcomes than other investments aimed at improving educational quality (Fletcher-Wood and Zuccollo, 2020).

In nearly every country and TVET institution represented in the survey, TVET teaching staff are offered CPD opportunities (see Figure 12). About 80% of TVET practitioners surveyed reported having engaged in CPD at least once over the past two years. Given that most TVET practitioners had also reported either not benefitting from pre-service training or receiving less than six months of pre-service training, their having access to CPD is especially important for filling any gaps in their skills profiles.

In 40% of the countries covered and 50% of TVET institutions represented in the survey, TVET teaching staff are not required to undergo in-service education or training. One

reason for this outcome is that in many countries policies and frameworks concerning TVET teaching staff's professional development are weak. Although a significant proportion of TVET teaching staff regularly engage in CPD despite not being required to do so, the survey respondents indicate that they are often forced to fund this at their own cost (see Figure 13). The fact that they are fulfilling their own training needs – often without clear guidelines or pathways – can lead to a lack of consistency (in terms of the knowledge, skills and competencies) with consequences for TVET quality.

TVET systems without competency-based qualification systems rely on staff's willingness to engage in CPD. It is known that in TVET teaching staff may be reluctant to attend training programmes owing to low salaries, work time pressures, family demands and/or other issues (Friedman and Phillips, 2001). To overcome this reluctance and encourage teaching staff to engage in CPD, TVET institutions and other stakeholders often offer financial and/or non-financial incentives. According to the survey results, the most frequently-used training incentive is financial support (e.g., training budgets), which prevents staff from incurring private costs for their participation in professional development activities. Another prominent incentive – reported by two-thirds of TVET practitioners surveyed – is the opportunity to acquire an additional qualification, which offers staff private benefits while building their professional capabilities.

Figure 12 - Are TVET teaching staff in your country/institution offered opportunities for continuing training and professional development (CPD)? Have you attended CPD programmes over the past 2 years?

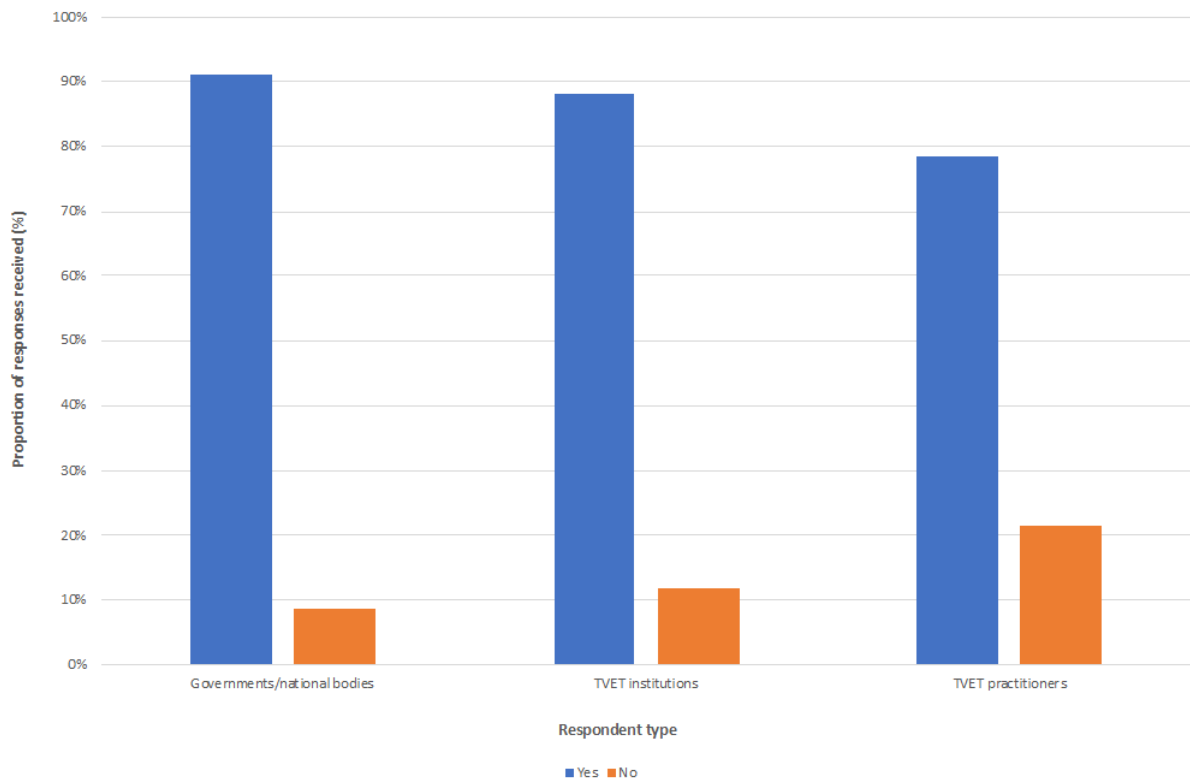
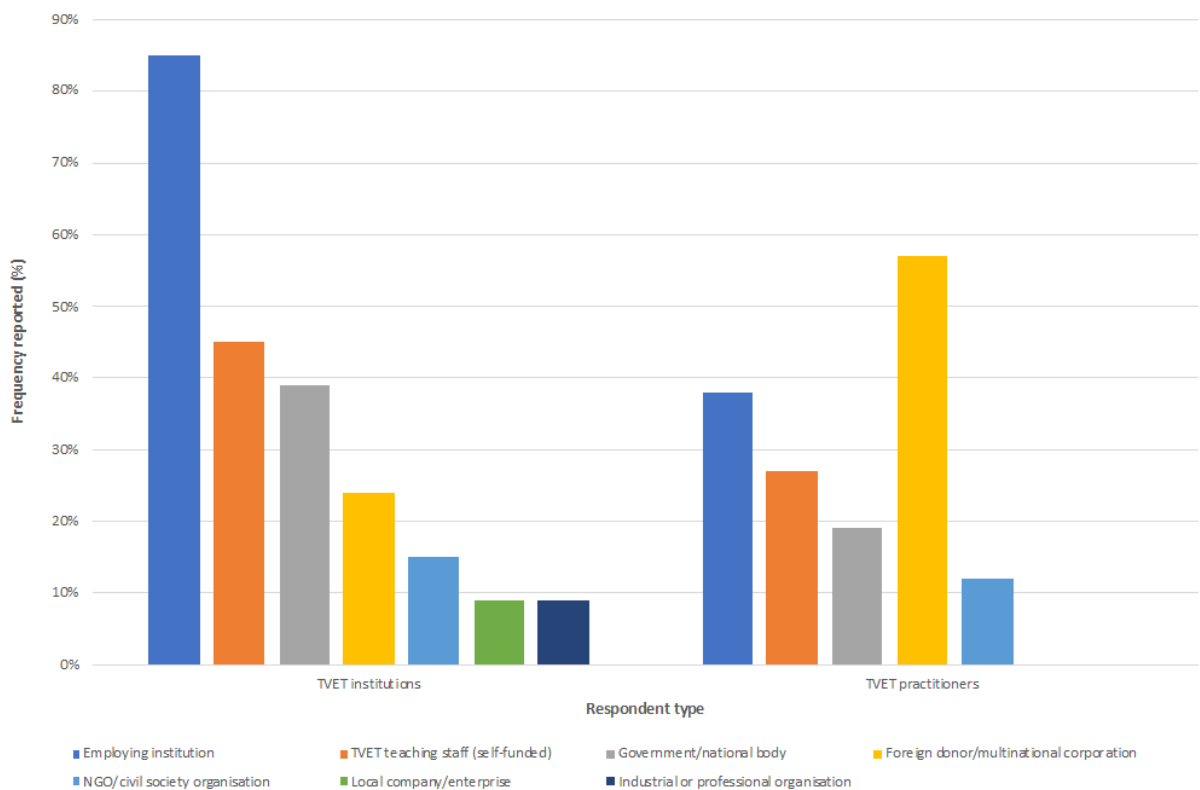


Figure 13 - Who funds continuing training and professional development programmes for TVET teaching staff in your institution? Who paid for the last training course that you attended?



Other less frequently-applied inducements include improved promotion prospects, paid time off work and wage supplements for engaging in CPD. However, these incentives also provide short-term, rather than long-term future-oriented rewards. For example, training budgets and paid time off work may encourage TVET teachers and trainers to attend training programmes, but may not persuade them to actively engage in the training once there. By contrast, gaining an additional qualification – which TVET practitioners ranked as their top training incentive – could enhance teachers'/trainers' reputation and marketability in the labour market, especially if the qualification is recognized and linked to career progression.

The approach recommended by the panel of experts for improving TVET teaching staff's uptake of CPD opportunities is to establish a training framework in which competencies are certified by a neutral body and linked to corresponding career paths. Such a system would fuel teachers'/trainers' appetite for and active engagement in CPD by making it aspirational, as a means and pathway to career progression. It would also improve the returns on investment realized

from in-service training. However, to make the system more inclusive and equitable, partnerships should be mobilized so that TVET teachers and trainers do not fully fund – but instead co-finance – the costs of CPD.

'Challenges and transformations, both in the world of work and learning, are very real. Attracting, recruiting and keeping young teachers and trainers in the profession is crucial for enhancing the quality of TVET. In our experience, offering young vocational teachers adequate opportunities for professional training, equipping them with the 21st century teaching and/or facilitating skills and ensuring that they have easy access to continuous professional development not only improves the teaching – learning outcomes, but also improves people's social and economic lives.'

Carolyn Bansbach,
Head of Section, Social, Health & Education, GIZ

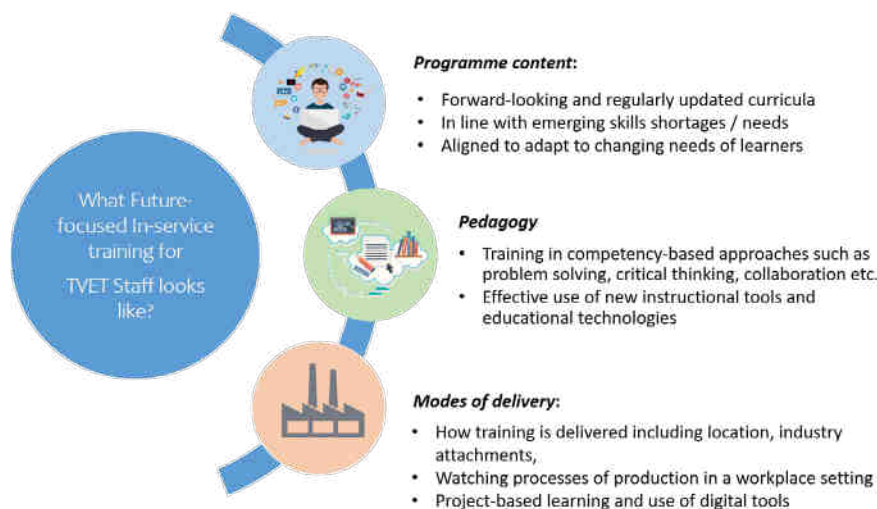
Trend 6: High-quality in-service training focuses on industry exposure, transversal and applied skills, and pedagogy as much as content

59% of the countries surveyed regularly update the curricula used to teach and/or train TVET teaching staff. 86% of the respondents indicate that the CPD programmes build teachers/trainers' ICT skills for teaching and general pedagogical competencies. More than half respondents rely on CPD to update their knowledge and skills on ICT, ESD and other cross-functional skills such as entrepreneurship.

As per the Expert panel and participants of the virtual conference, to ensure that in-service training programmes provide TVET teaching staff with the knowledge,

skills and competencies needed to prepare learners for the future of work and of learning¹², three broad areas need attention (Figure 14).

Figure 14 - Three broad areas to prepare learners for the future of work and of learning



Source: UNESCO – UNEVOC Study on Trends Shaping TVET Teaching 2020

¹² Discussions during the virtual conference on 'the future of TVET teaching and learning' emphasized the importance of TVET teaching staff being able to impart information in a learner-centred way, which meets the needs of '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.

Survey results suggest a similar trend that most countries (59% of those covered by the survey) regularly update the curricula used to teach and/or train TVET teaching staff, while many other countries (36% of those covered by the survey) are in the process of developing systems to regularly update their curricula. Only 5% of the countries covered by the survey had no mechanisms in place for updating the training curricula used to teach and/or train TVET teaching staff, as well as no current plans to develop such systems.

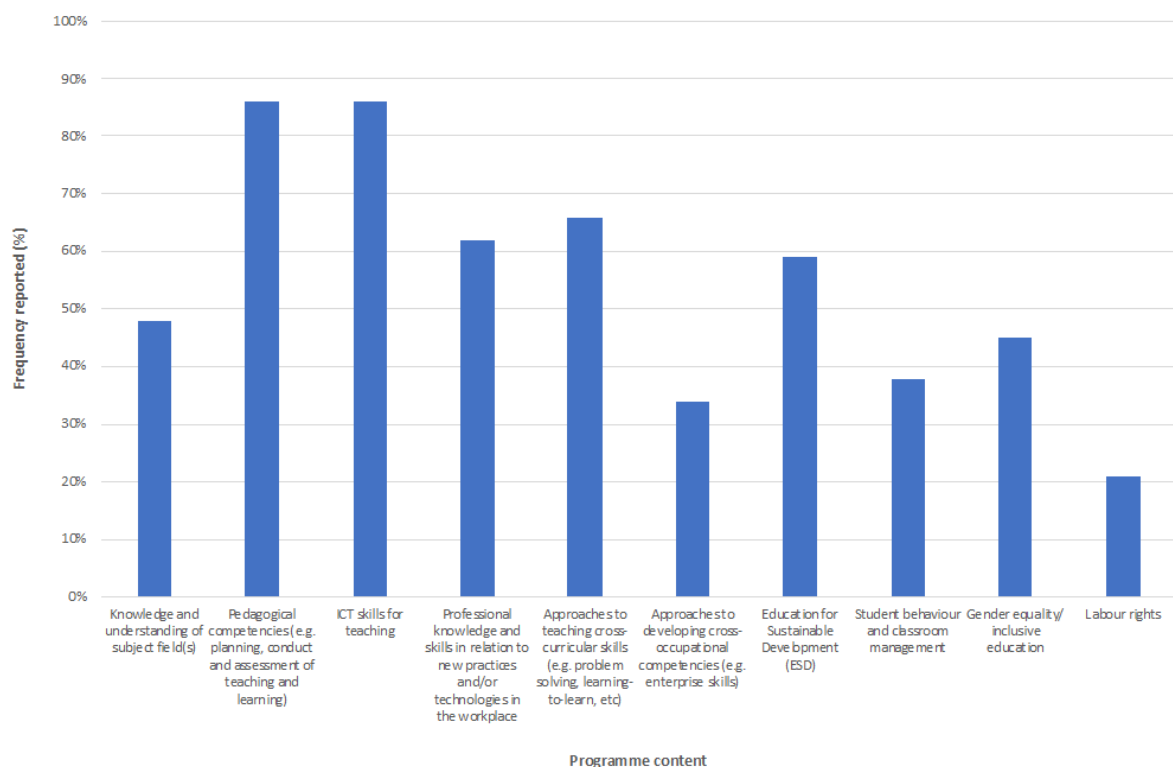
Interestingly, the content of most CPD programmes for TVET teaching staff seems to be forward-looking and aligned with expectations regarding what skills are required for the future of work. According to the survey results, the vast bulk of CPD programmes (86% of those covered by the survey) build teachers'/trainers' ICT skills for teaching and general pedagogical competencies. More than half focus on developing teachers'/trainers' capacities for teaching cross-curricular skills such as problem-solving and learning-to-learn, their knowledge and skills in relation to new practices and/or technologies in the workplace, and their competences in emerging skills areas, such as ESD (see Figure 15). Moreover, most CPD programmes give greater curricular emphasis to these new skills than to traditional subject-specific theories and concepts, which is appropriate given that learners require transversal skills in addition to specialized skills and knowledge for the most valuable jobs of the future (see Trend 1).

Developing teaching staff's pedagogical and cross-occupational competencies

Canada

TVET institutions that are members of Colleges and Institutes Canada (CICan) are encouraged to implement cross-departmental partnerships as part of their training for new teaching staff. The initiative involves faculty from different departments working together to improve their approaches to teaching. For example, a plumbing faculty member may be partnered with an accounting and nursing faculty member to demonstrate that pedagogical approaches are not restricted to specific disciplines, but instead concern the craft of teaching. Since the targets of the initiative are all newly hired faculty, a positive impact is the development of a community of practice that new hires can rely on and trust. Yet there are also persisting challenges. Although new faculty generally welcome taking part in the initiative, because the training programme takes place during the school year, some find it difficult to juggle preparation to teach students with being students themselves and having to complete assignments, attend classes, etc.

Figure 15 - Which of the following areas are currently taught in continuing training and professional development programmes for TVET teaching staff in your institution?



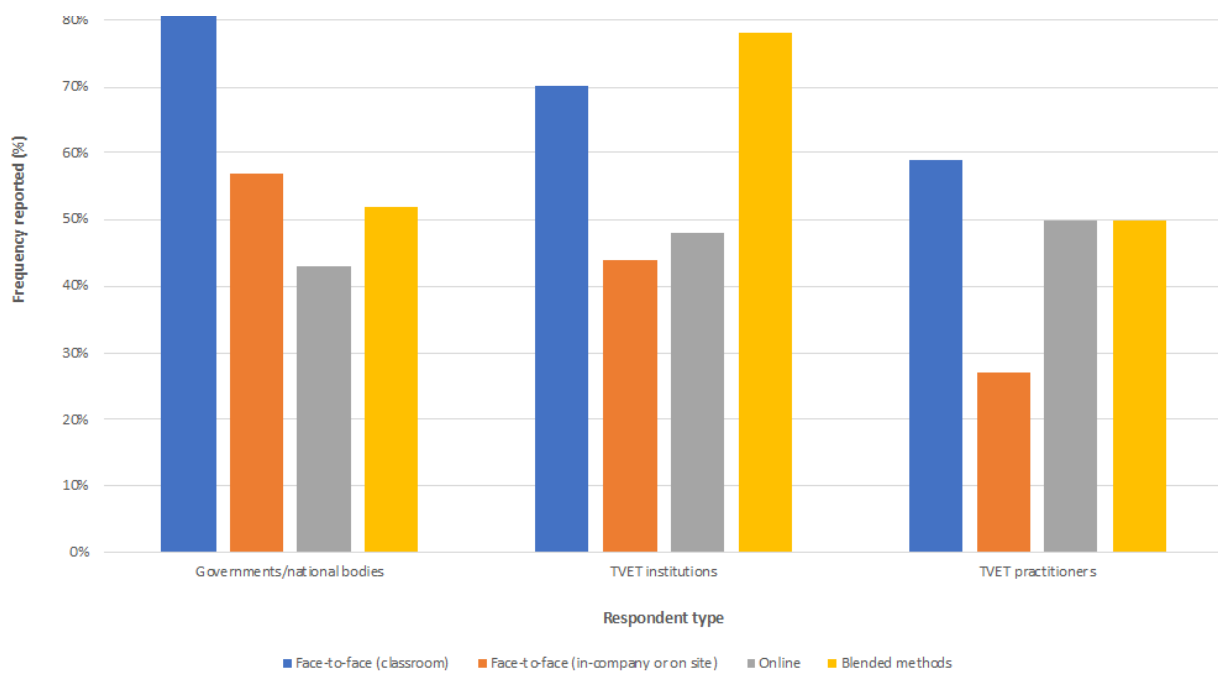
However, it also observed that most CPD programmes do not adequately develop teachers'/trainers' competencies in two key areas.

First, few CPD programmes (only one-third of those covered by the survey) provide teachers/trainers with the tools needed to develop learners' cross-occupational competencies required for entrepreneurship. As entrepreneurship is one of the top five skills needed for the future of work and is also the basis of many countries' policies for tackling youth unemployment (UNESCO-UNEVOC, 2013), this is an important gap. Nevertheless, it may be a short-term problem, since open-ended responses to the trends mapping survey show that some countries are already taking steps to address this issue. For example, government representatives from Seychelles and Bhutan indicated that entrepreneurship has recently been added to the curricula used to train TVET teaching staff in their

countries, while a participant from Madagascar said that entrepreneurship training will be offered to TVET teaching staff in his/her country beginning in 2020.

Second, the mode of delivery of most CPD programmes undermines teachers'/trainers' acquisition of practical skills and knowledge. The survey found the trend that most CPD activities take place in classrooms and/or online rather than in companies or on work sites (see Figure 16). It is likely that a significant proportion of TVET teachers/trainers learn about new workplace practices and technologies by attending lectures or reading online material, rather than by witnessing their application in an industrial setting. That only 11% of TVET practitioners surveyed reported having industry experience reiterates this. This finding highlights the need for strong industry exposure as a central component of CPD for TVET teaching staff, particularly in cases where teachers/trainers lack industry experience.

Figure 16 - How are continuing training and professional development activities for TVET teaching staff in your country/institution delivered? How have the CPD programmes that you have attended been delivered?

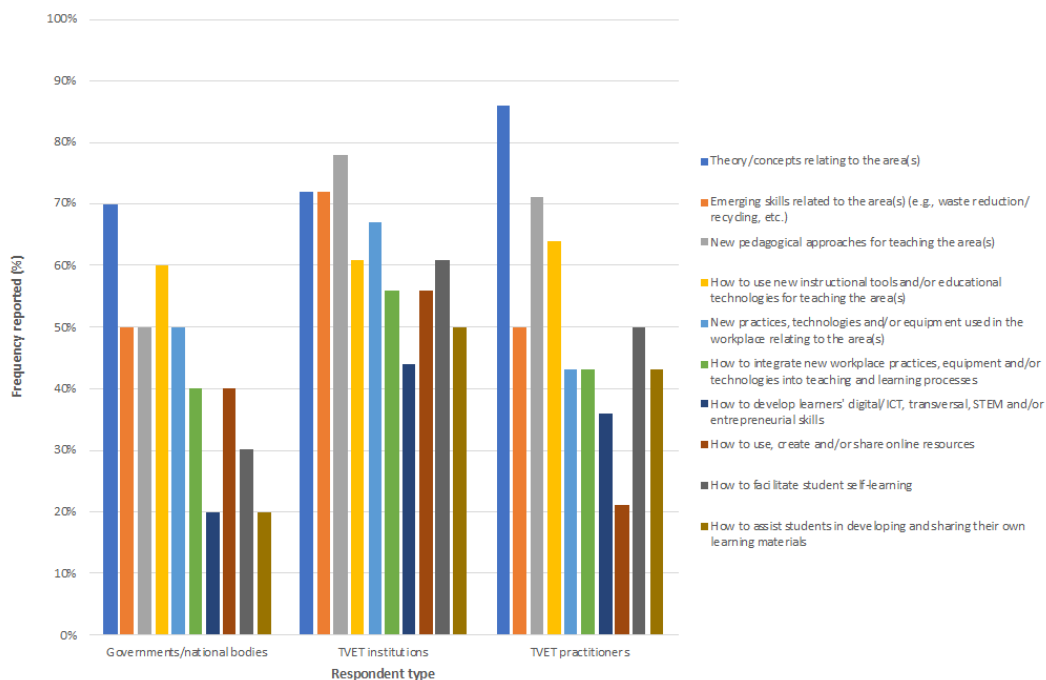


Preparing TVET staff for teaching/training Education for Sustainable Development

Survey suggests that CPD programmes covering ESD topics tend to focus more on developing teachers'/trainers' knowledge of theories and concepts than on improving their acquisition of emerging (or transversal) green skills¹³ such as waste reduction and energy efficiency (see Figure 17). These trainings do tend to build their competencies on how to use new pedagogical approaches, instructional tools to convey ESD subject-matter to learners.

13 Research shows that transversal green skills are more likely to be demanded in future than specific green skills related to green jobs, since many more established occupations will likely be 'greened' than new green jobs created (G20 Development Working Group, 2013).

Figure 17 - Which of the following knowledge, skills and/or competencies pertaining to ESD are currently taught in training programmes for TVET teaching staff in your country/institution



Building TVET teaching staff's competencies in and commitment to greening TVET

Nigeria

The National Board for Technical Education (NBTE) in Nigeria has implemented an initiative titled 'Greening Nigerian Polytechnics', which aims to raise environmental awareness and build capacity in greening TVET among institutional heads, academic staff, non-academic staff and learners in public TVET institutions. Actions taken to date by NBTE have included:

- Administering a survey on six TVET campuses to assess the extent to which green policies and practices are implemented
- Running a workshop to train 150 Greening TVET champions across three TVET institutions on environmentally-friendly practices and principles, and how these can be embedded in training.

To ensure the continuity of workshop outcomes and the entrenchment of green values and behaviours on TVET campuses, participating institutions were asked to form Green Teams, which will form part of the newly established Nigerian Polytechnics Green Campus Champion Network. The role of Green Teams is to execute their institution's green plan of action through awareness campaigns, reduction of waste and energy consumption, and conservation/deployment of resources. The expected short-term impacts of the initiative include:

- Improved capacity within TVET institutions to develop and implement sustainable policies and practices, like recycling, waste management and renewable energy
- Build TVET teachers' and trainers' competences to deliver relevant content across disciplines or in a specific area of competence
- Increase the number of curricula/learning resources relevant to sustainable development and greening
- Greater institutional commitment to environmentally-friendly and sustainable practices

The expected long-term impacts include:

- Green skills taught in TVET programmes across Nigeria
- Environmentally-friendly and sustainable TVET campuses
- Stronger stakeholder (including host communities') understanding of and interest in greening
- Generation of jobs in greening for TVET graduates
- Realization of the environmental, social and economic gains of greening

Preparing TVET staff for teaching / training entrepreneurship

Similar trends are apparent when examining the content of the training that TVET teaching staff receive in entrepreneurship (see [Figure 18](#)). Most CPD programmes covering entrepreneurship tend to focus on theories and concepts relating to entrepreneurship, as well as their knowledge of new workplace practices, equipment and/or technologies relevant to entrepreneurship (e.g., business planning tools). These programmes do not often cover emerging skills relating to entrepreneurship, such as the new soft skills (mindfulness, systems thinking, complex problem-solving, etc.) that entrepreneurs need to

remain resilient in a rapidly changing and technologically advancing work environment (Youth Business International, 2019). Teaching staff are rarely taught how to integrate new workplace practices, technologies and/or equipment into their teaching and learning processes or how to use new instructional tools and/or educational technologies for teaching entrepreneurship. Lack of training in these latter areas likely inhibits teachers'/trainers' capacity to develop learners' practical entrepreneurship skills.



'Vocational education and training makes people self-reliant. A vocational teacher should always introduce the concept of entrepreneurship and emphasize the dignity of labour'

Dilin Sathyanath, Vocational Teacher, India

Developing teaching staff's capacities in problem solving and critical thinking skills

Spain

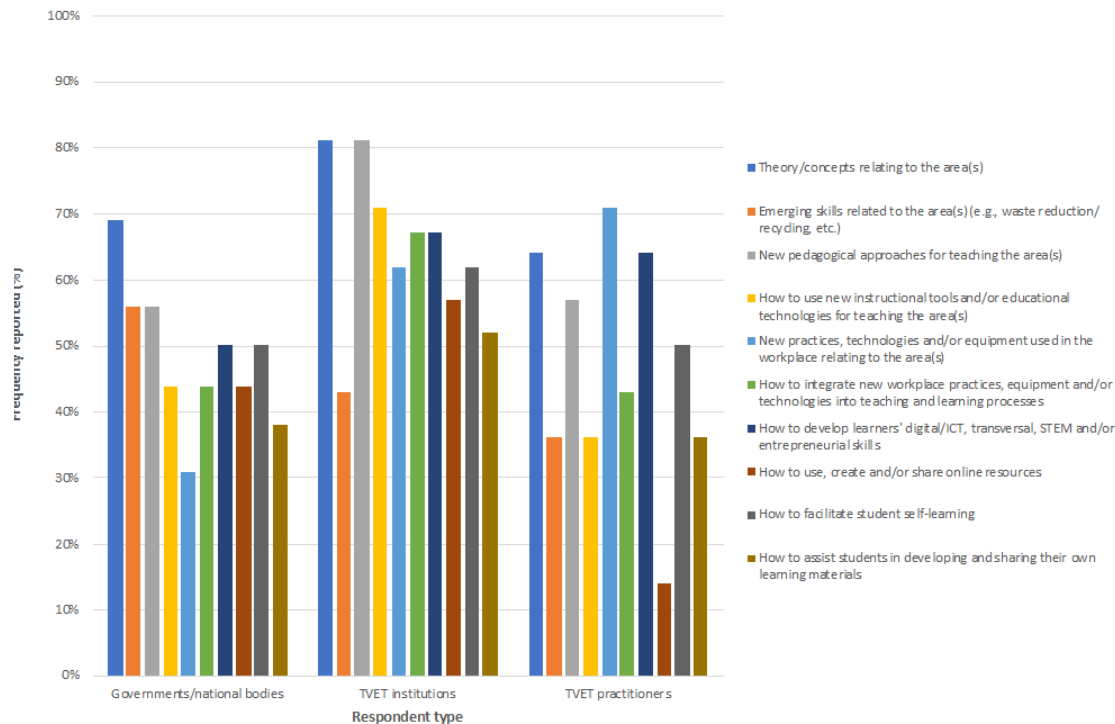
ETHAZI is a whole-learning model that may be articulated as 'collaborative learning based on challenges'. The model was developed to change the teaching methodology used in Basque TVET centres, and involves presenting problematic situations to a class configured into teams, who must work together to find the best possible solution to the problem. Implementing the model requires a reinterpretation of the mechanics of learning, so that learning is viewed as an evolutionary process, where the students are responsible for it. Challenge-based learning forces students to be individually, and in teams, responsible for producing a solution, which they then must analyse to determine what has worked well and what has not, and what they will do differently in the next challenge to achieve better results. The training that teaching staff need to be able to implement the ETHAZI model are:

- The ability to design challenges so that they are as close as possible to situations that may arise in the workplace
- The ability to assess what professional competencies and learning outcomes students need in each cycle to improve the efficiency in their learning times
- Lessons on promoting teamwork and responsibility and how to adjust their teaching approaches to fit the needs of students at each stage of the process
- The ability to recognize and assess student competency development at each stage of the cycle and to provide effective feedback

A diagnostic tool – the Skills Evolution Tool (SET) – has been developed to enhance the evaluation process and stimulate the participation of both teachers and students (individually and as part of teams) in the process. It is also worth noting that the implementation of the ETHAZI model requires a different classroom setup than usually exists in training centres. Flexible, open and interconnected spaces are best for fostering active-collaborative work.

Read more: <https://tknika.eus/en/cont/proyectos/ethazi-3/VISIT ETHAZI REPOSITORY>

Figure 18 - Which of the following knowledge, skills and/or competencies pertaining to entrepreneurship are currently taught in training programmes for TVET teaching staff in your country/institution?



Developing TVET staff's competencies in interactive, ICT-driven entrepreneurship training

Romania

Since 2008, TVET teachers in Romania have received training to enable them to implement an interactive, interdisciplinary, student-centred method for delivering entrepreneurship education – the 'training firm' – in which teachers act as coaches, facilitators and moderators assisting learners to set up virtual companies. The training firm is an innovative, practically-oriented teaching method that was developed in Austria. Using an online platform – which provides information relevant to companies and simulates processes in the business environment, such as the activities of chambers, banks and regulatory authorities – students set goals, plan activities and independently manage their enterprise, coached and accompanied by their teacher. The training firm experience develops learners' critical thinking, problem-solving and ICT skills. It also improves their practical skills and ability to apply knowledge, thus reducing the period of adjustment to future employment, as well as increases their understanding of the strengths, weaknesses, opportunities and threats to running a business. It thereby builds their resilience and responsiveness to changes taking place in the world of work.

The training that TVET teachers receive to facilitate this process includes:

- Training to build their competencies in interactive teaching and learning methods, and in developing teaching and learning materials for entrepreneurship education
- Capacity-building to improve their knowledge of and ability to apply tools for quality assurance of the teaching-learning evaluation process
- Training on how to develop learners' entrepreneurial mind-sets and ability to target opportunities and take risks
- Opportunities to practice teaching strategies and exchange good practices with experts from other European countries

Teacher training is often carried out in conjunction with domestic private sector firms (e.g., SC Magnum SRL) and transnational partners (e.g., Kultur Kontakt Austria). Furthermore, since 2010, multipliers have been trained to increase the number of teachers receiving this training. Read more: <http://firmaexercitiu.tvet.ro/>

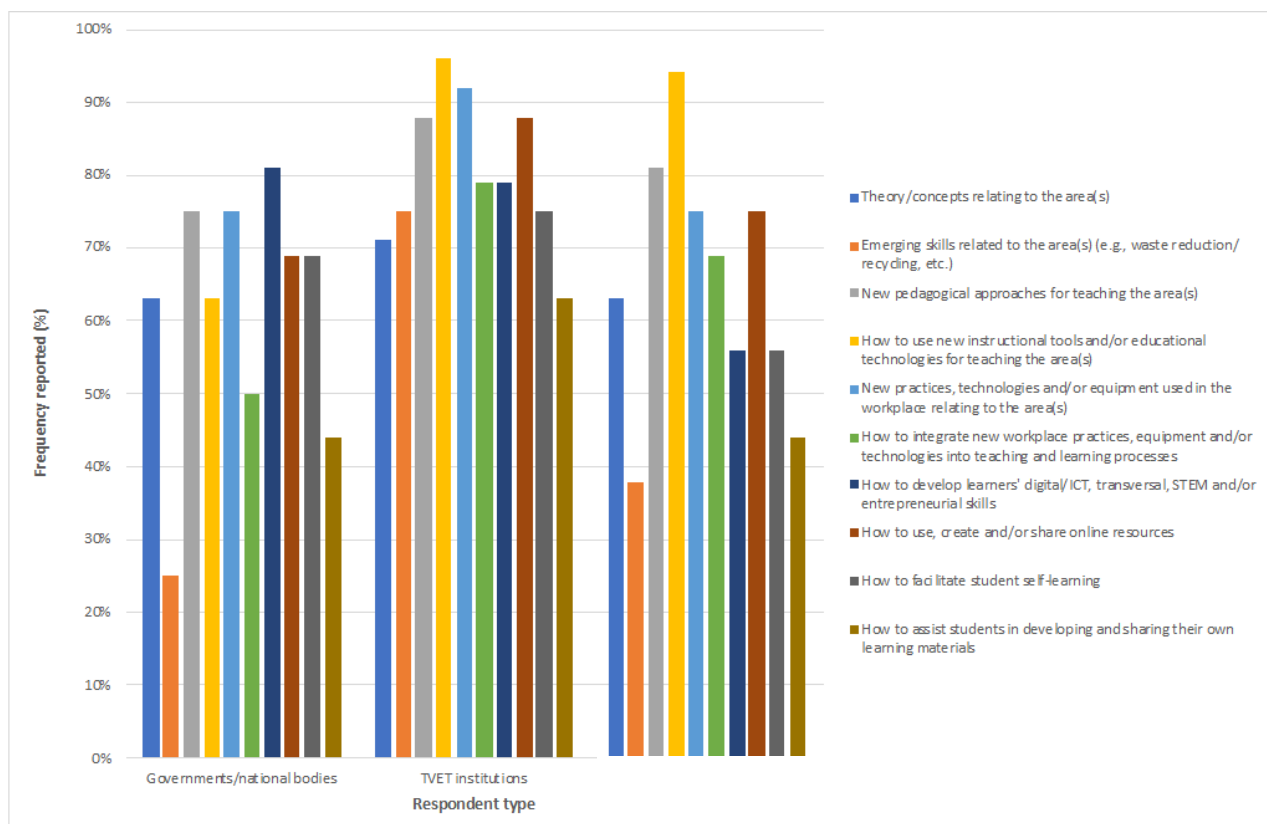
Preparing TVET staff for teaching/training ICT/digitalization

The training that TVET staff receive in ICT/digitalization likewise tends to focus on improving their understanding of theories and concepts, as well as their knowledge of new workplace practices, technologies and/or equipment (see Figure 19). They receive adequate instruction on new pedagogical approaches, instructional tools and/or educational technologies to teach ICT/digital subjects. However, teachers/trainers seldom receive training on emerging skills in ICT, such as those associated with big data, cloud computing and artificial intelligence, which are forecast to be the key skills required for ICT-related jobs over the next 10 years (Watters, 2018). Less attention tends to be paid to training TVET teaching staff on how to assist learners in using ICT/digital technologies as tools for learning, communication and/or collaboration. Yet these applied ICT skills are needed to solve complex problems and remain competitive in a knowledge-based economy (Joynes et al, 2019).

This trend indicates that:

- First, to prepare TVET teaching staff to deliver future skills, the curricula needs to be closely aligned with the findings of skills forecasts and/or other information (e.g., academic research). The analysis in this section suggests that CPD programmes need to focus more on developing teachers'/trainers' transversal skills, rather than their knowledge and understanding of subject-specific theories and concepts
- Second, TVET teachers/trainers need training in pedagogy as much as content to build learners' practical and applied skills
- Finally, TVET teaching staff require strong and regular industry exposure to develop their practical skills and knowledge and to keep up to date with new practices, technologies and equipment being deployed in the workplace. This can take the form of industrial attachments or by encouraging TVET teachers/trainers to engage in live industry projects.¹⁴

Figure 19 - Which of the following knowledge, skills and/or competencies pertaining to ICT/digitalization are currently taught in training programmes for TVET teaching staff in your country/institution?



¹⁴ Other (weaker) forms of industry exposure – industry involvement in TVET seminars, workshops and events or industry consultation on TVET programmes – are reported by the survey participants in their open-ended responses. While such exchanges may improve the flow of information between TVET teaching staff and industry practitioners, they do not build teachers'/trainers' practical skills and knowledge.

Preparing TVET teaching staff to integrate artificial intelligence into their teaching

People's Republic of China

Shenzhen Polytechnic (SZPT) has developed an action plan to implement the Chinese Ministry of Education's Artificial Intelligence Action Program for Higher Education Institutions. The action plan aims:

- To promote the transformation of higher TVET with the development of AI technology
- To intensify the integration of AI technology into SZPT's policies and programmes
- To set up a dialogue mechanism between TVET and the AI industry
- To provide graduates with knowledge, skills and competencies in AI concepts, methods, technologies, products and applications, as well as build their transversal skills in aspects of 'AI+' (e.g., economics, sociology, management, standards and laws)

A key pillar of SZPT's action plan ('Promote Quality Training and Learning') involves building the capacity of TVET teaching staff to conduct AI-aided teaching, including by developing AI resources and tools for education. Based on the concept that mutual interaction and collaboration between teachers and students is the core of AI education, SZPT aims to transform the way that training is delivered, both to students and teaching staff, from an individualized mode to one involving structured, hierarchical, team-based cooperation. Teaching methods will be aligned with research findings regarding effective models for integrating AI into education and training, and boundaries between colleges and disciplines will be broken down, so that the focus is on developing teachers' and learners' cross-occupational competences. To support teachers in making the shift to new forms of teaching and learning, an AI experimental classroom will be built, and both pre-service and in-service teachers will receive training in AI and other new technologies. In-service teachers will receive at least twenty class hours of training each year.

Industry-university cooperation will also be promoted to establish a long-term mechanism and tools for predicting and responding to future AI-related skills demands. Leading enterprises will provide information on changes in the AI environment, define and revise standards for AI-related training courses, help to develop teaching materials for AI project-based courses and practical training, and provide supplementary teaching and course resources.

'In this fast-changing world of the 21st century, the critical role of a teacher as a facilitator of learning is increasingly complex and important. Teachers must adequately prepare students for today's and tomorrow's work. Optimal learning outcomes will not be achieved by traditional teaching in isolation. Teachers must be proactive in establishing linkages with the relevant industries to ensure content is current and demand-driven. It will require a blended approach to teaching and learning, including the strategic use of technology in the classroom and outside of the classroom as well as the continuous development of teachers'

*Joseph Nsengimana,
Director, African Centre for Innovative Teaching and Learning in ICT,
Mastercard Foundation*

Trend 7: Responsive TVET systems ensure that TVET staff receive adequate training in gender responsive and inclusive methods

62% of those represented in the survey have policies in place to train TVET teachers/trainers in gender responsive/inclusive pedagogy; less than one-half of TVET practitioners surveyed reported having benefited from this training. TVET Staff of the future will be trained in inclusive methods like alternate formats, gender responsive, managing multi-cultural classrooms, etc.

Owing to low educational access or attainment and/or discriminatory norms and practices, women, minority groups, learners with special needs and other marginalized groups often end up in low-skilled jobs and most at risk due to the changes taking place in the work of work. Measures need to be put in place to increase workers' and learners' resilience to global shocks and disruptive events. Some of which are rendering jobs obsolete while creating new work opportunities.

TVET systems can build teachers'/trainers' capacities to minimise these impacts on disadvantaged groups. Future TVET staff will need to be trained in inclusive methods like alternate (e.g. digital) formats for improving accessibility, introducing a gender responsive/inclusive pedagogy or managing cultural and linguistic diversity in classrooms etc. In the aftermath of a global pandemic like COVID-19, it has become increasingly important to build the learners' resilience and offer them advice to cope in a rapidly changing and increasingly competitive work environment.

The survey suggests the trend that most countries and TVET institutions (between 80% and 90% of those covered by the survey) have put in place measures to improve TVET teachers'/trainers' capacity to deliver TVET using alternative (e.g., digital) formats (see Figure 20). In contrast, only just over 50% of the TVET practitioners surveyed reported receiving training in this area. One possible explanation for this



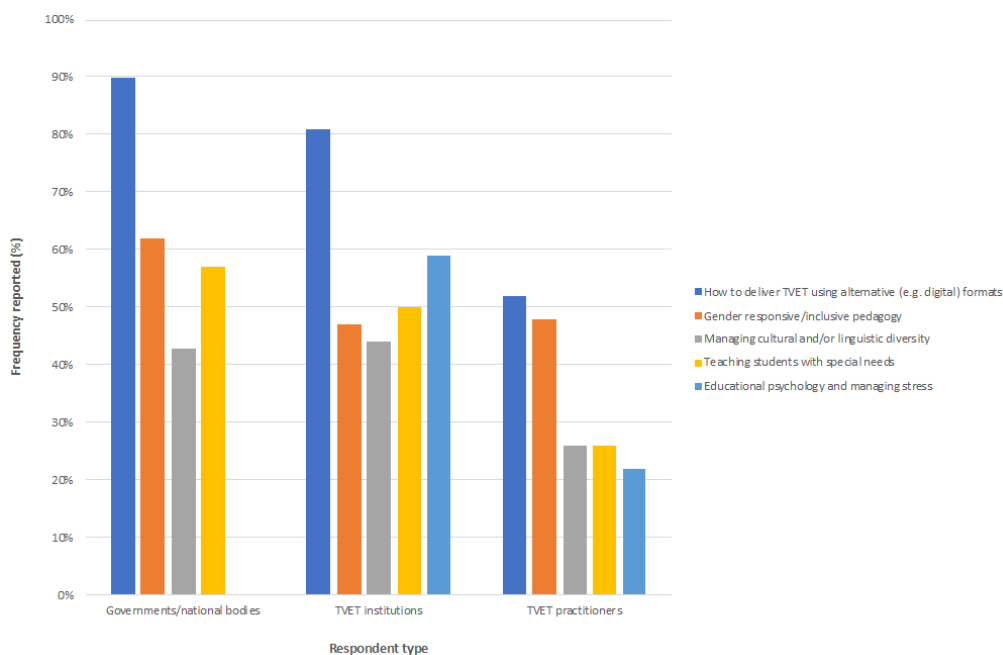
'A confident, courageous and respectful instructor encourages excellence from learners. He/she does not only draw a picture of the trainees' future but also shows them a way to achieve it. A vocational teacher's biggest reward is empowering students to excel in their future profession!'

Reyhaneh Taebnia, Vocational Teacher, ITC, Iran

outcome is that policies to provide training in this area are recent and are in various stages of roll out.

Inclusion and participation are essential to human dignity and to the enjoyment and exercise of human rights (UNESCO, 1994). To assess how far TVET systems have put in place measures to combat discrimination and create inclusive

Figure 20 - Are TVET teaching staff in your country/institution offered training in any of the following areas to promote greater equity and inclusion in TVET? Have you received training in the following areas?



learning environments, the survey asked whether TVET teaching staff in their country/institution are offered training in gender responsive and inclusive pedagogy, managing cultural and/or linguistic diversity and teaching students with special needs. The responses suggest that 62% of countries represented in the survey have policies in place to train TVET teachers/trainers in gender responsive/inclusive pedagogy (see [Figure 20](#)). Less than half of TVET practitioners surveyed reported having benefited from this training. Likewise, while over 40% of national- and institutional-level representatives indicated that TVET teaching staff in their country/institution receive training in managing cultural and/or linguistic diversity or teaching students with special needs, only around one-quarter of TVET practitioners surveyed reported receiving training in either area.

Looking back at Trend 4 and Trend 6 in context of what is taught in pre-service and in-service training programmes provides interesting insights. Most pre-service training programmes place a higher emphasis on teachers and trainers being able to manage classrooms and student behaviour than on their ability to check and manage their own behaviour and attitudes – for example, by checking for biases in their own and others' language, checking for involvement of the whole class, adopting methods to cater to different learning styles, etc. Gender equality and inclusive education receives higher priority than student behaviour

and classroom management in most CPD programmes, however these are taught mainly as a standalone units/modules rather than being integrated into subject matter training as part of CPD training curricula.

Survey responses also suggest that, although most TVET institutions (nearly 60% of those covered by the survey) offer training in educational psychology and managing stress to TVET teaching staff, only 22% of TVET practitioners surveyed have received training in this area (see [Figure 20](#)). Labour rights are also not a key focus of most pre-service and in-service training programmes for TVET teaching staff; only around 20% of the pre-service and CPD programmes covered by the survey offered training in this area¹⁵. None of the TVET practitioners surveyed reported receiving training in labour rights. This is an area that requiring further attention, given that both the survey results and VC discussions highlighted growth in vulnerable employment in recent years.

In some cases, lack of policy focus on promoting greater equity and inclusion in TVET reflects a lack of technical, financial and/or human capacity, rather than a lack of understanding of the importance of making TVET more inclusive. External partnerships are a valuable to overcome these capacity constraints, external partnerships are a valuable commodity.

Improving TVET teaching staff's intercultural competencies

Colombia

Escuela Tecnológica Instituto Tecnico Central in Colombia – in partnership with three other universities and an intergovernmental agency – has implemented several internationalization workshops targeting teaching staff and programme coordinators. These workshops are part of a larger strategic project, 'Promotion of the Internationalization of Higher Education', launched in response to globalization processes and Colombia's increased economic and educational openness.

The aim of the workshops is to develop institutional strategies for addressing internationalization in higher education. The workshops are run using a participatory Open Space methodology, wherein participants themselves create the agenda prior to the workshop taking place and then work in teams during the workshop to determine the future strategy. Their proposed solutions are then routed into programme coordinators' Action Plans and teachers' Work Plans, so that the two groups can work together to implement them. The workshops have resulted in the updating of the curriculum and the upgrading of teaching and learning strategies at the Escuela Tecnológica Instituto Técnico Central. For example, in Colombia the vision of internationalization of the curriculum has traditionally been limited to including learning material in another language. However, as a result of the workshops, teachers are now able to use different strategies for teaching and learning, such as mirror classes, inverted classrooms with international guests, case studies and entrepreneurship promotion in cooperation with international companies (e.g., Festo). They have also gained greater intercultural sensitivity.

Furthermore, because the initiative links teaching staff and programme coordinators from several institutions, it has encouraged the formation of networks for further impacts, such as the organization of knowledge transfer events and the formulation and completion of several joint projects. However, there have been some challenges. For example, staff turnover and some teachers' resistance to change have affected the positive impacts that the initiative could have.

Read more: <https://acofipapers.org/index.php/eiei2017/2017/paper/view/2120/866>

¹⁵ see Figures 10 and 18

Trend 8: TVET of the future relies on private sector as essential partner within in-service and CPD curriculum

47% of TVET practitioners surveyed reported not interacting with the private sector. 40% of the institutional respondents say that mechanisms to encourage industrial attachments for TVET teaching staff do not exist. Experts view live industry projects, secondments of industry practitioners to institutes and market-driven certification of trainer competencies as essential to improving the quality of TVET and TVET Teaching/training. TVET institutions must build mechanisms for industrial attachments for TVET staff within their in-service and CPD curriculum.

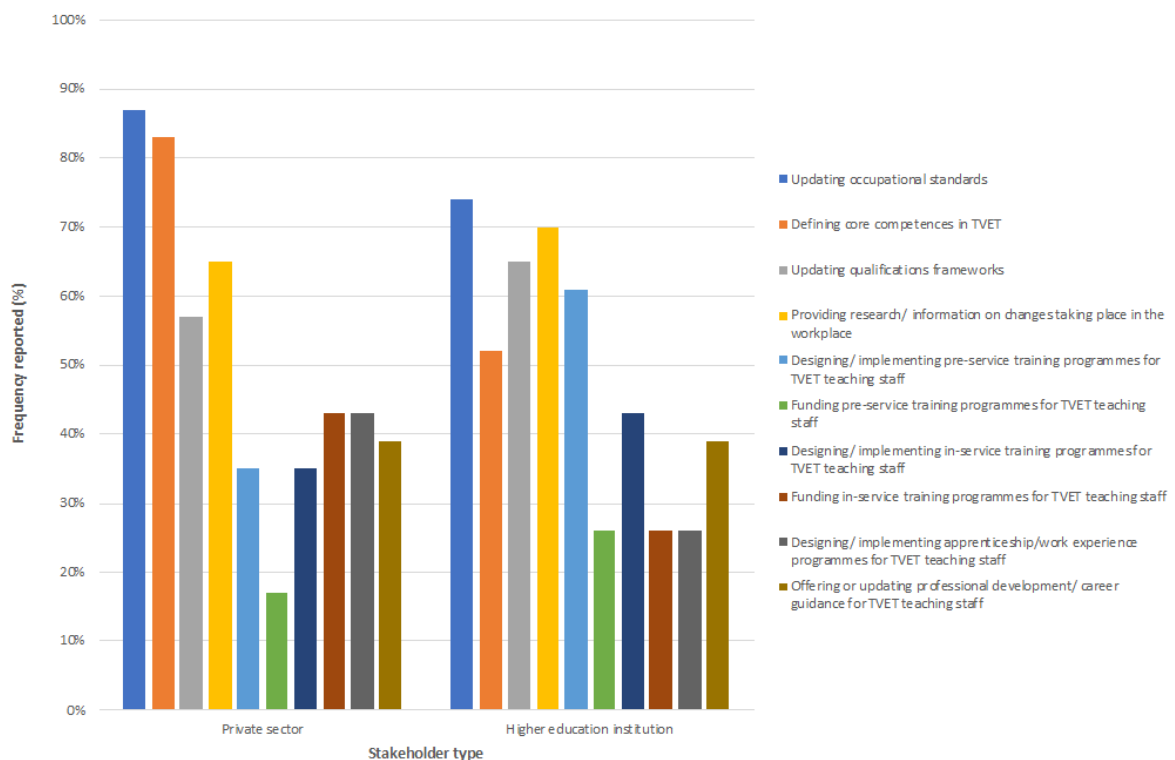
The private sector's involvement in TVET is especially essential as the pace of change in the world of work increases. Their role, however, cannot be limited to providing information on the labour market, or offering an overview of competencies. Instead, the private sector has to be involved in both the delivery of vocational training and skilling/upskilling/reskilling of TVET staff. To engage the private sector in a practical and sustainable manner, measures to align vocational training with the private sector's skill shortages and talent gaps is needed. Other institutions such as universities, social partners, donors are also important partners in training TVET staff.

Looking more closely at what role the private sector plays in most countries' TVET systems and processes, it appears that the private sector mainly provides information on labour market needs by defining core competences and occupational standards, and (to a lesser degree) overseeing how this information is fed into qualifications frameworks (see Figure 21). It also plays a somewhat limited role in the training and professional development of TVET staff,

including by offering TVET teachers/trainers internships or work experience opportunities. 47% of the TVET practitioners responding to the survey reported having no interaction with the private sector, while 40% of institutional representatives said that mechanisms do not exist in their institution to encourage industrial attachments for TVET teaching staff. As a government representative from Palestine noted in his/her survey response: 'The relation with the private sector [is] still weak in the field of teacher training support.'

As the trend indicates, private sector involvement in training of teachers/trainers is for the most part in the form of funding or training provision. The survey respondents from all countries covered, indicate that the bulk of funding for CPD programmes comes through some form of Institutional and International partners such as foreign donors, multilateral agencies and multi-national corporations. In less than 40% of countries covered by the survey, governments/ national bodies provide funding for CPD, while private sector companies/enterprises and industrial/professional organizations play a minor role.

Figure 21 - What roles do the private sector and higher education institutions play in TVET systems and processes in your country?



A virtual conference participant from Italy shared their experience regarding the expense of maintaining up to date infrastructure and equipment. The participant stated that '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 mobilize additional financial resources to cover such investments every year.' This and other examples indicate that an over-reliance on TVET institutions to self-fund staff trainings could result in delays and gaps, since there may be a trade-off between funding staff training vs upgrading training infrastructure. Provision of CPD programmes for TVET teaching staff indicates similar trends where TVET institutions and foreign donors are the main providers and private sector plays a minor role (see Figure 22).

Interestingly, TVET staff also play a role in meeting their own training and information needs by engaging in peer-to-peer learning. 86% of institutional respondents and 57% of TVET practitioners surveyed indicated that mechanisms exist in their country/institution to encourage information sharing among TVET teaching staff. These kind of structures and informal partnerships play an important role on bridging the gaps due to lack of formal institutional programmes. However, over reliance on peer-to-peer learning among TVET teaching staff may not fulfil the need for CPD sufficiently and could limit generation of new ideas and information.

Higher education institutions also play a limited role in most countries' TVET systems. They are mainly involved in providing research and information on changes taking place in the world of work, updating occupational standards and qualifications frameworks, and designing and implementing

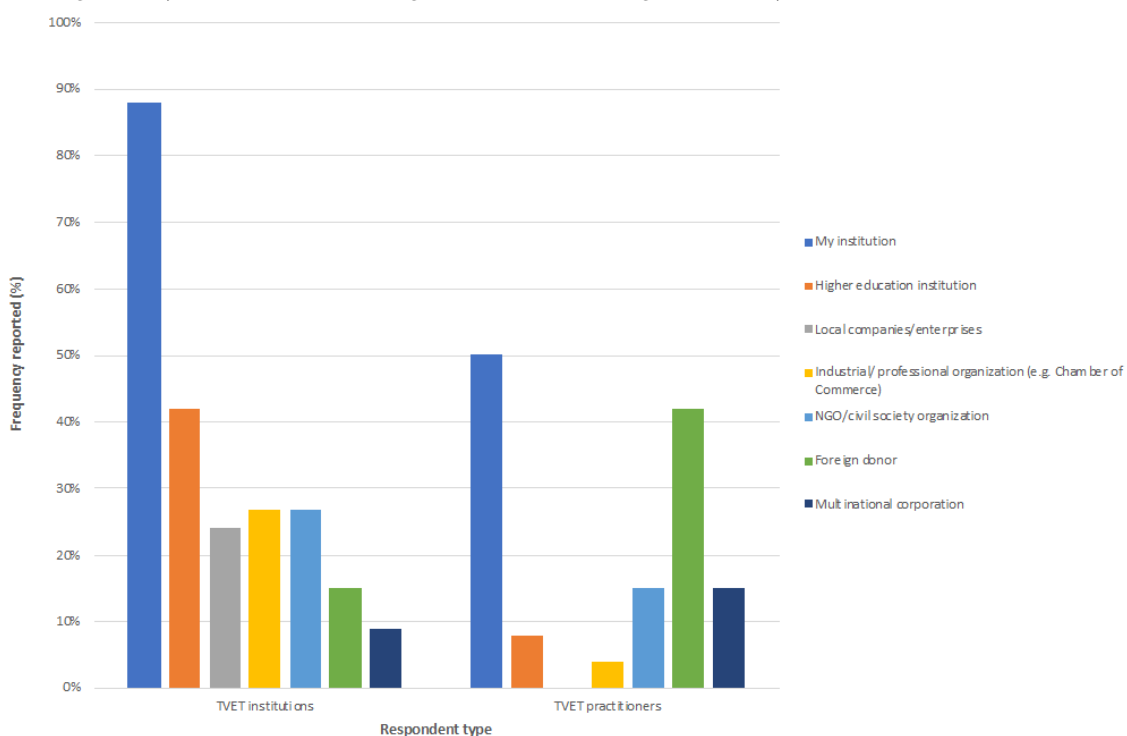
Industry-school cooperation to build TVET teaching staff's capacities in ICT

Jordan

To assist the Government of Jordan in its aims to transform the country into a digital economy by improving skills in ICT, the German Corporation for International Cooperation (GIZ) has been working with public and private sector partners to equip young people with digital skills, as well as to develop occupational standards within the IT sector in line with current and future labour market needs. One aspect of the GIZ's work has been to implement training programmes for TVET teaching staff in digitization. These programmes are implemented in close cooperation with the private sector/IT companies, who are involved in both curriculum development and training TVET teaching staff. The training is aimed at developing teachers' practical, technical and didactic skills, as well as their capacity to use digital learning tools.

pre-service training programmes for TVET teaching staff. However, their involvement in CPD for TVET teaching staff tends to be limited. Moreover, given that universities, research centres and other higher education institutions tend to obtain information on shifting labour market requirements from companies, they cannot be regarded as a substitute for private sector engagement.

Figure 22 - Who provides continuing training and professional development programmes to TVET teaching staff in your institution? Who organized the last training course that you attended?



Involving private sector in staff training is often difficult and unsustainable and can result in symbolic involvement. Aligning training with the needs and benefits of the private sector might be a way of increasing their involvement. Several examples of models that bring about such an integration exist. These include use of live industry projects as the backbone of staff training, allowing companies to benefit in form of innovative exchanges. Another, commonly used mode is secondment of industry practitioners and experts to training institutes to fill existing gaps in teacher/trainer training while offering opportunities to high-performing individuals to teach and mentor other practitioners. These models can significantly reduce the training costs for TVET institutions, therefore serving as alternate funding source. Virtual conference respondents from Canada and Nigeria said that TVET teaching staff in their institutions sometimes carry out projects on behalf of private sector firms, while a participant from Madagascar said that professionals often serve as TVET teaching staff in his/her institution.

Private sector could benefit from investing in TVET staff – through certifications, exposure to new technologies, training on industry standards and occupation and health standards, assessments – by way of reduced recruitment costs resulting from the teachers/trainers improved ability to nurture / train job-ready learners. An industry certified instructor/trainer also reduces the gap between training and real-working requirements. Therefore, it might be that future TVET teaching staff will be industry practitioners.

Despite the many benefits, government involvement to strengthen private sector engagement is necessary especially in countries with large informal and school-based vocational training. Virtual conference discussions also highlighted this and how government intervention may be required to convince private sector actors of the value of trained TVET

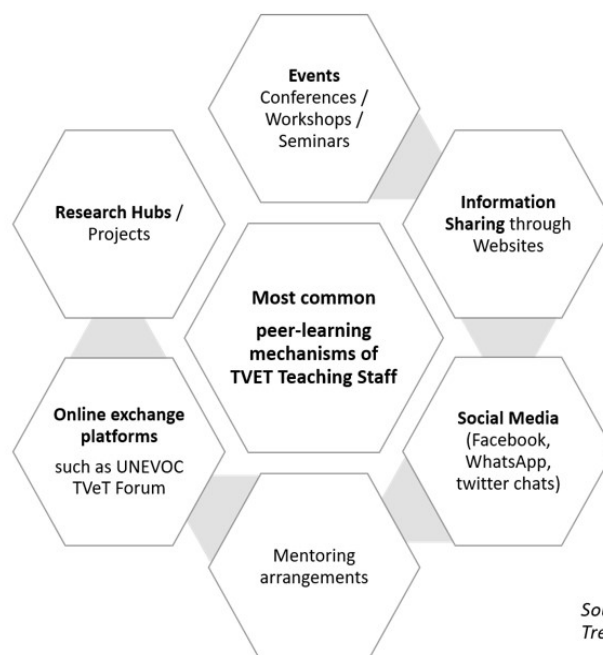
Peer-to-peer learning

South Africa

Zibuza.net is an online professional learning community that aims to improve the quality of teaching in South Africa by providing training, support and a platform for teachers to connect with their peers and other educational stakeholders. The site gives teachers access to a wide range of resources, such as lesson plans, classroom activities, courseware, tools and files, which support quality teaching and learning, and enable teachers to be more efficient and productive. One of the goals of Zibuza.net is to elevate the teaching profession in society. Therefore, teachers are awarded Reputation Points based on their participation and contributions to the community, which are then used to showcase and reward top-sharing teachers. Institutions can also use the site to advertise job opportunities and be matched with suitable candidates looking for new teaching posts.

Read more: <https://zibuza.net/>

teaching staff for their own interests of locating appropriately skilled staff. For example, a participant from Mozambique shared: '[B]efore 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



Source: UNESCO – UNEVOC Study on Trends Shaping TVET Teaching 2020

experience not caring where and how the competencies were acquired.' Other participants also emphasized how governments may need to play a role, at least initially, in forging mutually beneficial partnerships between the private sector and TVET institutions. For example, a participant from Zambia also shared 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.'

Top-level coordination is also needed to harmonize the activities of public and private partners involved in the training and professional development of TVET teaching staff, to ensure that these interventions serve the needs of TVET teaching staff while advancing broader national goals.

Use of ICT to improve the quality and future-orientation of training by in-company

Germany

Germany's Federal Institute for Vocational Education and Training (BIBB) has developed an internet portal (foraus.de) to provide high-quality continuous training and support to in-company trainers. The portal has four main functions:

- Continuous training: the portal offers free online learning modules on topics connected to in-company training practice
- Information dissemination: it provides information on new trends, such as the growing use of digital information and knowledge management systems in work and training contexts
- Information exchange: it allows for peer-to-peer exchanges of experiences and viewpoints
- Networking: it enables users to forge cross-institutional and interdisciplinary connections with other trainers and experts

The portal is organized into four sections:

- News: articles, reports and interviews on initial and continuing training topics
- Forums: where trainers can exchange views and network with other trainers or experts
- Topics: information of relevance to trainers – e.g., regulations concerning in-company training, innovative practices in delivering training in the context of Industry 4.0 – presented in condensed form via texts, videos, check lists and illustrations
- Learning Centre: methodological and didactic guides and tools relating to selected areas of in-company training practice

The portal currently has around 11,500 registered members and is the largest community of trainers in Germany. It can be accessed free of charge and via mobile devices.

Read more: https://www.foraus.de/de/foraus_112681.php

Research-based learning approaches for TVET staff

Italy

Teachers, trainers and tutors at Cometa Formazione, a UNEVOC Centre in Italy, 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 research-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.

Weblinks: www.puntocometa.org/home/english-area/

Trend 9: Effective stakeholder coordination is seen as a mechanism to improve coordination and quality of training and professional development of TVET staff

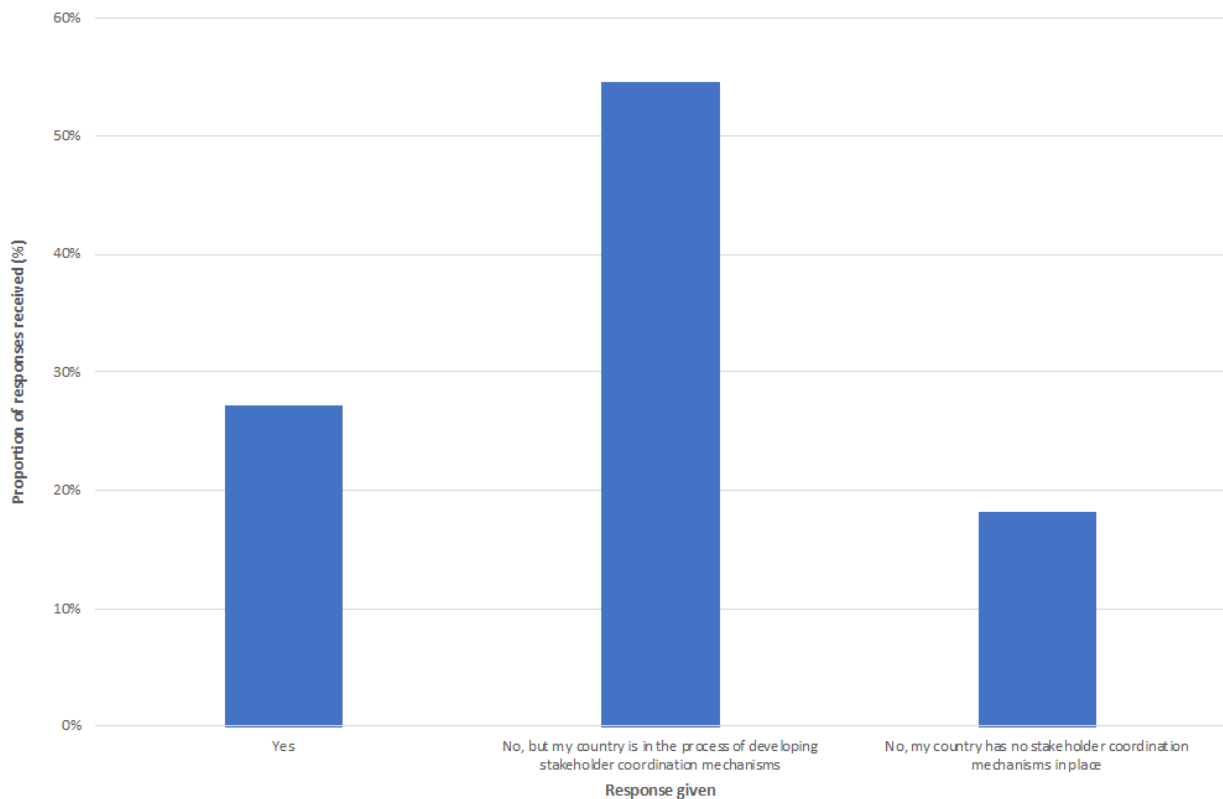
Only 27% respondents indicated having institutional mechanisms for multi-stakeholder in place, although 55% are in the process of developing such mechanisms. In the context of TVET teaching, this may include creating a marketplace for industry projects, competency-based certification programmes, information exchange cum jobs portal in line with the continuously changing skill requirements and other incentive mechanisms to engage teachers and trainers.

TVET teaching is a multi-stakeholder process that can function when all partners - government, institutions, companies and trainers - contribute effectively towards the end that the competencies needed to deliver the skills of the future are available to all teachers and trainers. The need for strong multi-stakeholder cooperation mechanisms and a place to coordinate the activities of stakeholders involved in the training and professional development is evident. Often these mechanisms do not exist due to competing priorities and/or lack of resources. It is therefore not surprising that only 27% of countries covered by the survey have mechanisms for multi-stakeholder partnerships in place (see Figure 23). Although 55% of countries covered by the survey are in the process of developing mechanisms for facilitating coordination and cooperation among stakeholders involved in TVET teaching, nearly 20% of countries covered by the

survey) lack such systems and have no current plans to develop them. The trend also indicates that these issues tend to be more severe in the low- and lower-middle income countries covered by the survey, than in the upper-middle and high-income countries¹⁶.

According to government/national body representatives from countries that lack coordination systems, the main barriers to establishing them are lack of funds, lack of system capacity, and low interest among stakeholders (especially the private sector) in participating in coordinating bodies. Lack of these mechanisms has contributed to weak cooperation and information flows among stakeholders. When asked what issues or challenges their country faces in improving TVET responsiveness to changes taking place in the world of work, 59% of government/national body representatives reported

Figure 23 - Do mechanisms exist in your country for facilitating coordination/cooperation between the stakeholders involved in the training and professional development of TVET teaching staff?



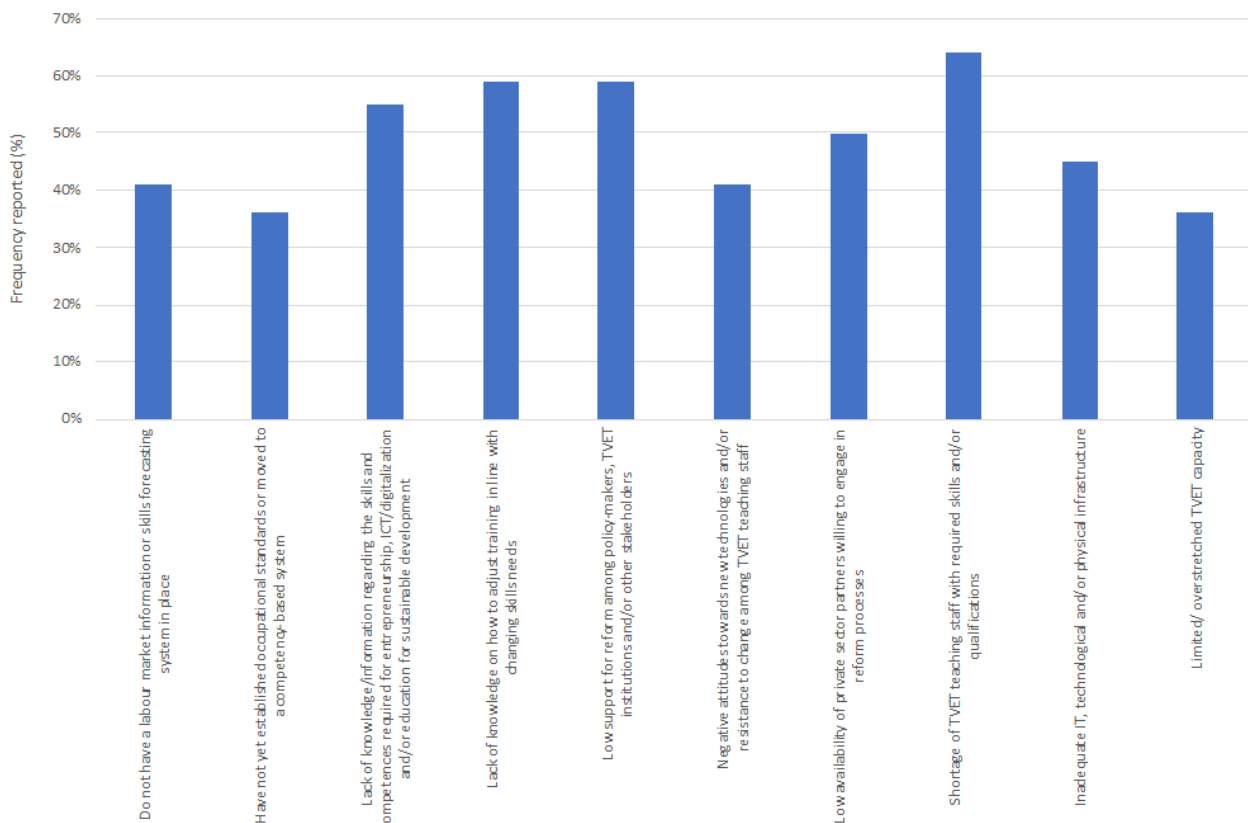
¹⁶ These make up the bulk of countries with systems already in place for coordinating the training and professional development activities of stakeholders.

low support for reform among policy-makers, TVET institutions and/or other stakeholders, while a similar proportion (50%) cited low availability of private sector partners willing to engage in TVET reform processes (see Figure 24). Some countries that have well-established coordination mechanisms have overcome this issue by having industry bodies such as chambers or sector skill councils play a facilitative role between the private sector and the TVET system¹⁷.

Yet some form of top-level coordination is required to improve the responsiveness of TVET teaching staff training systems to future skills needs, given that these systems operate in a rapidly changing environment in which the demands on TVET teaching staff are growing and their skills needs become more complex. Effective governance mechanisms should enable coordinated action by public and private stakeholders across different levels (international, national, regional/local and sectoral) in objective setting, implementation, monitoring and review. Clear roles should be established among stakeholders to avoid gaps and/or

overlaps in functions, and broad agreement should be reached on what skills and competencies should be developed, as well as how teachers'/trainers' engagement in CPD will be incentivized and rewarded.¹⁸ Coordination mechanisms are also vital for ensuring that there is stable and sustained funding for TVET teaching staff training, especially given that foreign donors are currently the second-largest funders of CPD programmes across countries covered by the trends mapping survey and TVET institutions are the first. Despite the valuable role that the private sector plays in ensuring that TVET teaching staff training is aligned with current and evolving skills needs, there is a need for effective regulations to ensure that access to high-quality training is available to all TVET teaching staff in all areas serving students from a wide range of socio-economic backgrounds. Furthermore, the private sector will only agree to cooperate, and coordination efforts will only take place in a constructive and sustained manner, if stakeholders understand each other's views and constraints and plan initiatives in a manner that is aligned with all of their interests.

Figure 24 - What issues/challenges does your country face in improving TVET responsiveness to changes in the world of work?



17 Examples of stakeholder coordination bodies in countries which have them include: TVET Council and foundation for the continuous training of workers, comprised of representatives of government, workers' associations, employers' associations and public and private TVET institutions (Basque region in Spain); interagency committees consisting of employers, education providers and government (Kazakhstan); TVET Policy Review/Implementation Committees (Sri Lanka); and programme advisory committees (Canada).

18 For example, how certification systems for recognising TVET teaching staff competencies will be organized and implemented, and how they will link to career progression pathways.

Building TVET teaching staff's knowledge, skills and competencies in ESD

Germany/Vietnam

The UNEVOC Centre Magdeburg has cooperated with a centre of excellence for greening TVET in Vietnam, the Vocational College of Machinery and Irrigation, to jointly develop a cross-occupational training module for TVET teaching staff on 'Environmental protection, energy and resource efficiency'. The module combines the acquisition of knowledge with a range of practical tasks and explorations, and is aimed at encouraging staff to engage in applied learning as well as to reflect on their own attitudes and behaviours in relation to the environment. Skills taught in the module include environmental awareness, teaching practices using selected micro and macro methods (e.g., brainstorming, exploration method, etc.), and approaches to link these ideas and practices to lesson plans and student assignments. Teaching staff also receive training in learner-centred methods, including how to guide students in planning and executing surveys, conducting group work, working with case studies, and self and group assessment.

The training module was developed with the cooperation of local industry representatives, who provided inputs regarding their current practices and emphasized the growing need for workers with cross-occupational awareness and skills/behaviours relating to environment protection, energy and resource efficiency. As a result of this collaboration, companies expressed a willingness to support teaching staff by sending them relevant material and inviting them for company visits to learn about current energy efficiency practices and framework conditions.

As a second step, the Magdeburg Centre provided advanced training to teaching and management staff to enable the Vocational College of Machinery and Irrigation to act as master trainers/multipliers to roll out the module across other training institutes in Vietnam and surrounding countries. There are also potential plans to have in-company trainers participate in the programme to enable them to act as multipliers within their companies.

Trend 10: Mechanisms to engage TVET teaching staff are vital for aligning TVET systems to future skills needs

Nearly 60% of institutional respondents suggest that TVET teaching staff are too busy and/or paid too little to engage in training/upskilling. One-quarter of TVET practitioners surveyed reported not having attended any training of teachers/trainers programmes over the past two years. Despite their role in improving quality of TVET provision, only one-third of government/national body representatives see their non-involvement as an issue.

TVET teaching staff have complete knowledge of the impacts of policies on TVET learners, as well as what training and support they themselves need to do their jobs and/or fulfil their career aspirations. Yet evidence from the survey suggests that TVET teacher/trainers are not consulted on the decisions that affect them.

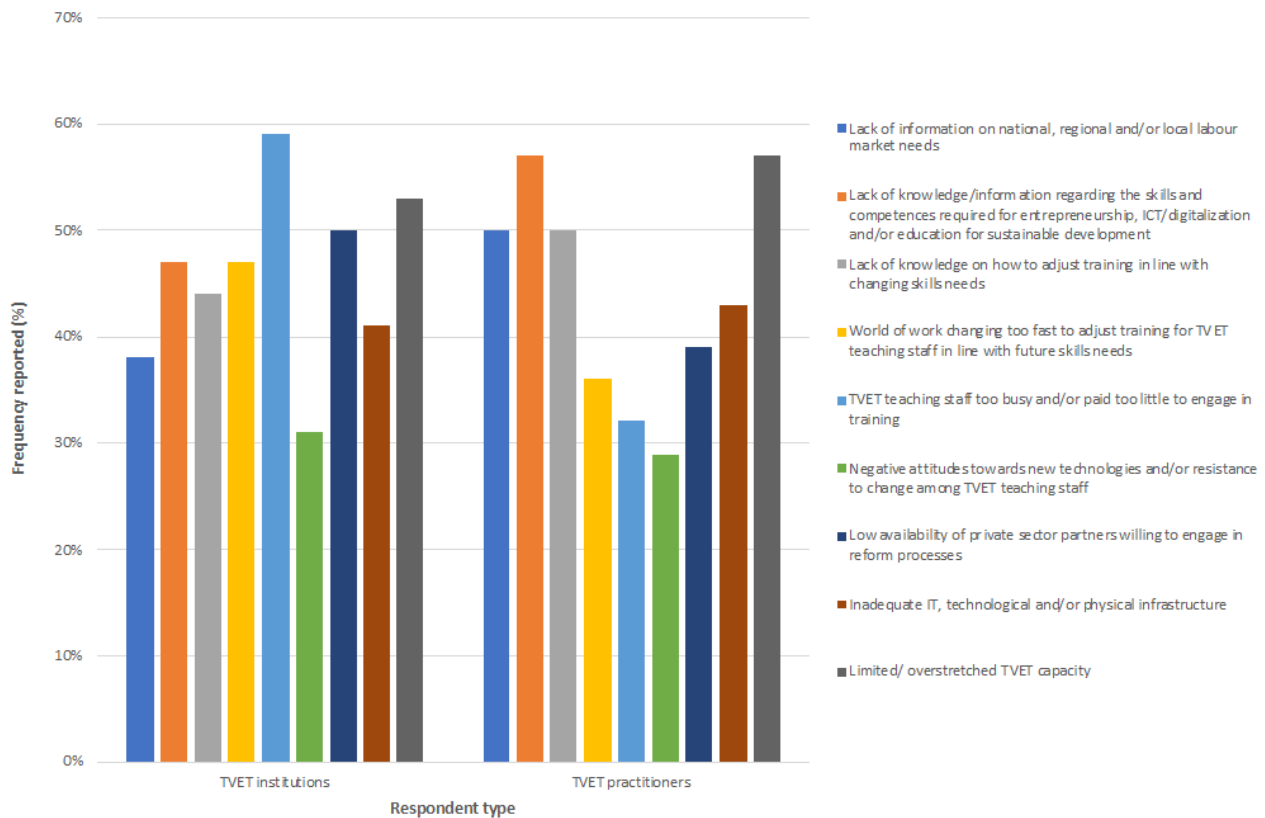
- TVET practitioners obtain greater information on changes in the labour market from their peers or via social media rather than formal institutional sources.
- Less than half of governments/national bodies are regularly assessing TVET teaching staff's skills and training needs.
- The main incentive used by TVET institutions to encourage TVET teaching staff to engage in CPD activities is not the one most valued by TVET practitioners themselves (certificate/additional qualification)



'I would like to encourage all young teachers to be committed to TVET, to LIVE, LOVE and SERVE their students and the TVET profession with pride, and to transfer inspiration and positive attitudes and values to their charges at all times. Remember, good teachers teach, even when not teaching!'

*Kevin Coke, Vocational Teacher,
University of Technology, Jamaica*

Figure 25 - What issues/challenges do you/does your institution face in providing learners with the skills they need for the future of work?



An interesting result from the survey is that governments and TVET institutions are often unaware of the constraints that TVET teaching staff face and what their views are regarding training and professional development opportunities. For example, when asked about the barriers that exist to providing TVET learners with the skills they need for the future of work, the most frequent answer given by institutional representatives responding to the trends mapping survey (nearly 60%) was that ‘TVET teaching staff [are] too busy and/or paid too little to engage in training’ (see Figure 25). Yet this was the bottom-second reason given by TVET practitioners surveyed. The assumption that TVET teachers/trainers may not wish to engage in training could affect the training opportunities offered to them, and may explain why one-quarter of TVET practitioners surveyed reported not having attended any training of teachers/trainers programmes over the past two years (see Table 4). Moreover, although over 50% of TVET practitioners (as well as TVET institutional representatives) responding to the survey cited “limited/overstretched TVET capacity” as one of the top two barriers to providing learners with the skills required for the future of work, only one-third of government/national body representatives saw this as an issue.

These discrepancies demonstrate that strengthened communication via regular consultation with TVET teaching

Table 4 – In the past 2 years, how often have you attended training of teachers/trainers programmes?

Survey responses	TVET practitioners	% of total
Never	7	25%
1-2 times	17	61%
3-5 times	4	14%
6 or more times	0	0%

staff is needed to avoid misunderstandings and reach informed policy decisions to improve the responsiveness of TVET systems to evolving skills requirements.

One positive finding of the survey, which found broad agreement across all three respondent groups, is that TVET teaching staff are not resistant to change and do not have negative attitudes towards new technologies, which is a hopeful sign in a fast-changing and technologically advancing world increasingly prone to global shocks and other disruptive events.

Conclusion and way forward

The UNESCO's Futures of Education Commission 2019 has observed that 'knowledge and learning are humanity's greatest renewable resources for responding to challenges and inventing alternatives. Education does more than respond to a changing world. Education transforms the world.'

Global disruptions are changing the way we live, work and learn. New technologies are emerging, remote forms of working and learning are becoming commonplace, and workers need new skills such as problem-solving, ICT, entrepreneurship and STEM, while continuing to require traditional skills and knowledge. TVET systems must rise to the challenge of supporting learners to prepare them for the workplace of the future. To prepare these learners for future competencies and industry requirements, TVET teaching staff must possess essential competencies and qualities themselves. In addition to the ever-evolving knowledge and skills, they also need to be able to implement new teaching and learning approaches to meet the needs of learners who may or may not have grown up in a digital age.

With this study, UNESCO-UNEVOC aimed to identify 10 trends that will shape the future of TVET teaching. It intended to improve understanding of the implications of global disruptions on the current and future practices of TVET teaching. It also attempted to gather knowledge, insights, experiences and practices from the international TVET community on the steps that TVET systems should take to prepare teachers and trainers to deliver the skills needed in the 21st century and beyond. The study covered most regions and countries, giving a complete picture from both developed and developing perspectives. The study also presented an opportunity to rethink and look at known and existing challenges, and evaluate how various stakeholders view these.

Based on the evidence gathered, the study suggests the following to support TVET teaching staff to deliver the skills required for the future of work and of learning:

- Data on emerging skills needs is continuously gathered and disseminated to TVET institutions and TVET staff.** The key to improving the quality of TVET at the institutional level is not just adapting courses to the labour market shifts, but also disseminating this information to teachers/trainers in a way that it helps them upgrade the provision of TVET. *In future-focused systems, results of skills forecasts are available to TVET institutions, teaching staff and learners.*
- TVET Staff need a cross-section of skills as part of in-service training and CPD to be prepared for the future.** The demands on TVET teaching staff are growing. Teachers and trainers are expected to possess future-oriented skills, be self-directed learners, and be sensitive and inclusive with regards to gender, cultural and learning differences and social disadvantages. To fulfil these high expectations, institutions need to improve training and support. *Future-focused TVET systems have frameworks in place to deliver pre-service and in-service training, regularly assess teaching staff's skills and training needs, and develop or reform training programmes based on these assessments.*
- Industry experience or exposure constitute the strongest component of pre-service training.** Pre-service training can no longer be a time bound academic course leading to a qualification. To provide TVET teaching staff with the practical skills and knowledge that learners need for the future of work, pre-service training must encompass industry experience or exposure. At the same time, teachers/trainers need grounding in active, learner-centred pedagogy and andragogy to build learners' cross-curricular skills and cross-occupational competencies, as well as training in emerging skills areas such as ESD, entrepreneurship and ICT/digitalization. *Future-focused TVET systems are continuously developing measures to engage the private sector.* Consultation with the private sector to establish pre-service and/or in-service training programmes is a cornerstone of future-focused TVET systems. Governments and TVET institutions in these systems are also researching the possibilities and implications of industry experience as a formal entry requirement for TVET teaching staff positions.
- Long-term future-oriented incentives increase teaching staff's desire for in-service training.** CPD enables TVET teaching staff to keep up to date with new developments in their subject field and the world of work. It is especially important in a rapidly changing labour market, where skills requirements change regularly. To overcome reluctance to undergo in-service training, long-term future-oriented incentives are needed. *Future-focused TVET systems link certification of teaching staff competencies to career progression to create a pull for in-service training.* They also engage the private sector in training and certification processes to raise the currency, recognition and portability of TVET teaching staff skills and competencies.

- **In-service training includes strong industry exposure, focus on transversal and applied skills, and on pedagogy as much as content.** Transversal and applied skills such as problem-solving and collaboration need to be integral to curricula, and teachers and trainers need grounding in learner-centred pedagogy as much as content to learn how to build learners' practical and applied skills. *Future-focused TVET systems regularly upgrade modes of delivery.* They incorporate industry exposure to develop teachers'/trainers' own practical skills and knowledge, and keep them up to date with new practices, technologies and equipment being used in the workplace. Live industry projects as part of training is used as powerful means of providing this exposure to the TVET staff.
- **Emerging skills areas, such as ESD, entrepreneurship and ICT, need to be part of pre-service as well as in-service training programmes for TVET teaching staff.** Training focus within these areas need to build transversal competencies, and include subject-specific theories and concepts as well as pedagogical training aimed at developing learners' practical and applied skills. *Future-focused systems around the world have already started investing in upgrading teacher/trainer qualifications* to build competencies on topics such as climate action, green skills, innovation, entrepreneurial learning and use of modern digital tools for blended models of TVET delivery.
- **TVET teaching staff need to receive training in inclusive teaching methods.** To minimize the impacts of global disruptions on disadvantaged and vulnerable learners, TVET teaching staff need to know how to deliver TVET using alternative (e.g., digital) formats to accommodate learners unable to physically attend classes. They need training in gender responsive/inclusive pedagogy, managing cultural/linguistic diversity and teaching students with special needs to make lessons and class interactions more equal and inclusive. They also need training in educational psychology and labour rights to build learners' resilience and ability to cope in a rapidly changing and increasingly competitive work environment. COVID19 has demonstrated the need for these transitional competencies and several reports have shown that *future-focused systems benefit from the preparedness of teachers and trainers on inclusive teaching methods.*
- **Partnerships, especially with the private sector, increase system capacity to deliver future-oriented training.** Industry involvement plays a key role in ensuring that TVET staff are aligned with their needs. They have an important role to play in both delivering the training of teachers and trainers, and creating value for it by certifying their skills and competencies. Donors and higher education institutions also play important roles in increasing access to, and enhancing the relevance of, TVET teaching staff training. *Future-focused TVET systems engage the private sector in a practical and sustainable way. They align training outcomes with the private sector's interests and current and future skills shortages.* Many such systems have also incentivized the participation of companies as a key partner of their vocational training system.
- **Strong mechanisms to strengthen multi-stakeholder partnerships are needed to effectively coordinate stakeholders' activities.** Effective governance mechanisms enable coordinated action by public and private stakeholders across different levels (international, national, regional/local and sectoral) in objective setting, implementation, monitoring and review. Clear roles should be established, and broad agreement reached on what skills and competencies should be developed, as well as how teachers'/trainers' engagement in CPD will be incentivized and rewarded. *Future-focused TVET systems have effectively institutionalized stakeholder cooperation in a constructive and sustained manner.* Mechanisms for stakeholder involvement and dialogue have been built into TVET teaching and learning systems. The effective functioning of these, however, depends on the openness of all partners to understand each other's views and constraints, and plan initiatives in a manner aligned with all of their interests.
- **Regular consultation with TVET teaching staff is key to building a resilient, responsive and future ready TVET system.** TVET teaching staff have a complete knowledge of the impacts of policies on TVET learners, as well as what training and support they themselves need to do their jobs and fulfil their career aspirations. Mechanisms should be in place to ensure that TVET teaching staff are regularly consulted on the decisions that affect them. *Many future-focused systems have developed strong communication channels between governments, TVET institutions and TVET teaching staff.* This leads to effective policies and thereby improves the responsiveness of TVET systems to evolving skills requirements.

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