



COMMONWEALTH *of* LEARNING

**Research Study:
Training for Blended
TVET in Pan
Commonwealth
Countries**

Research Study: Training for Blended TVET in Pan Commonwealth Countries



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Introduction

This report – commissioned by the Commonwealth of Learning (COL) – provides an overview of research into good practice in blended learning in technical and vocational education and training (TVET) and the competencies teachers need to teach in digital learning environments.

It provides background for the development of digital competency standards for teachers to deliver blended TVET in Commonwealth countries in sub-Saharan Africa, Asia, and the Caribbean, as well as an accompanying toolkit for teacher-trainers. The research also provides an overview of the digital infrastructure and support systems TVET institutes need to implement blended delivery as well as some ways these can be developed in low-technology settings.

A list of countries is provided in attachment 1. Many of these countries have low levels of digitisation relative to Organisation for Economic Co-operation and Development (OECD) countries but are seeking to grow this capacity to ensure their citizens have the skills for digitised work and to support progress towards the [2030 Agenda for Sustainable Development](#) adopted by the United Nations General Assembly.¹ Information and communication technologies (ICT) are essential to achieving the goals set out in this Agenda.

Context

There is an urgent need to develop digital systems and capability in TVET institutions globally. Rapid technological change, driven by artificial intelligence, automation, and big data, is changing the way work is done and how educational institutions operate (ILO, 2021). TVET systems have a special obligation to ensure their students develop digital literacy, with access to the tools and equipment they need to do this, and are equipped to use digital technologies and systems effectively in the workplace and in life.

The coronavirus pandemic highlighted significant deficiencies in TVET's overall digital capacity in many countries, in both ICT infrastructure and digital capability. Few TVET institutions had the equipment, infrastructure, Internet connectivity, online learning software and platforms, pedagogical resources, and digital capabilities to adapt quickly and effectively to distance modes of teaching (ILO & World Bank, 2021; OECD, 2021a). Many had to close as a result, impacting negatively on students, especially those from low-socio-economic and disadvantaged backgrounds, those without Internet connectivity, and students requiring work-based learning and assessment to complete their studies (OECD, 2021a).

Closures also impacted on the quality of TVET and the motivation of teachers and students (ILO & World Bank, 2021).

¹ In particular, quality education (Goal 4), gender equality (Goal 5), combating climate change (Goal 13), reduced inequalities within and across countries (Goal 10), peace, justice, and strong institutions (Goal 16).

However, the pandemic also sparked innovation and ingenuity among TVET teachers and institutions. For example, when TVET institutions had to close in Palestine,

... we didn't stop teaching; we immediately started our YouTube channel and started uploading a lecture daily after recording it. We were able to finish all the theoretical curriculum and part of the practical skills curriculum. From this experience, I have learned new e-learning competencies and skills. (Samara, 2021, p. 8)

Teachers with access to a learning management system (LMS) were also able to continue teaching, with many utilising television and mobile phones for remote teaching as well (OECD, 2021a). This experience highlighted the imperative for TVET teachers to know how to use digital tools and resources in their teaching in order to respond to pandemics and other crises, but more importantly, to prepare students for participation in increasingly digitised work and life (CEDEFOP, 2021).

Transitioning to digital delivery is not easy, however. Educational institutions need to plan and obtain the resources to build digital ICT infrastructure systems, especially SMS and other online learning platforms (ILO & World Bank, 2021; Ndahi, 2020), and develop the capability of their staff to use these systems. Countries similarly need to plan strategically to digitise their TVET systems ensuring reliable Internet and electricity supply and a strategic approach to developing digital capability.

Scope of the research

This report focusses on the digital competencies required by TVET teachers to use technology effectively for distance learning. It does not cover the general pedagogic knowledge and competencies they need to teach in TVET but refers to the broader digital literacy skills required for work and citizenship in the 21st century (21C) as represented in Figure 1. TVET teachers need these skills to maintain their industry currency and to model them to students.

The research methodology is outlined in attachment 2.

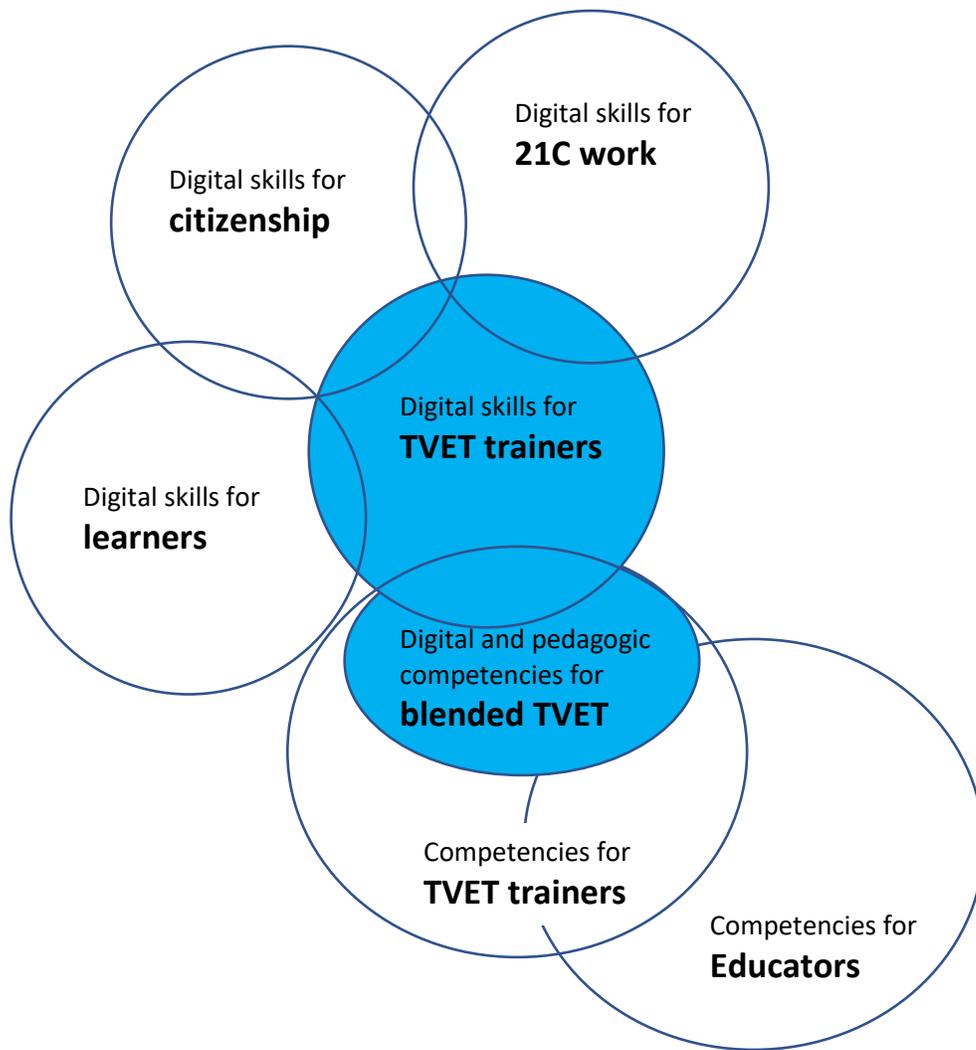


Figure 1. Scope of the teacher competency framework for blended TVET.
Highlighted in blue

Terms and definitions

Table 1. Definitions used in this report

Teacher	We use the term “teacher” in this report to include all people who teach and train in TVET (who may also be known as trainers, educators, facilitators, assessors, tutors, and lecturers).
Blended delivery	<p>Blended delivery refers broadly to any combination of face-to-face and online methods of teaching during delivery of a course. The online component may be live (or synchronous), such as using web conferencing sessions, or self-directed (asynchronous),² using structured learning resources accessed online at home or on campus. Ideally, blended delivery utilises both synchronous and asynchronous teaching methods, so students have some flexibility in where, when, and how they learn (Staker & Horn, 2012).</p> <p>“Blended” is, therefore, a relative term and variable, depending on the mix of face-to-face and online methods. The best blend or learning solution depends on the learning context, type of students (and their access to technology), the subject being taught, the available technologies (and their reliability), the digital competency of teachers, and students’ preferred ways of learning (Shank, 2020).</p>
Distance learning	<p>Distance learning is where learners develop competence online or in their workplace or community and does not require them to attend a physical campus (COL, 2020).</p> <p>One categorisation proposes that courses that are referred to as “online” usually have most (at least 80%) of their content delivered online, whereas blended (or hybrid) courses have anywhere from 30% to 80% of their content delivered online (Allen et al., 2016). Distance delivery is, therefore, at one end of the blended-learning continuum, so distinctions can become somewhat arbitrary and unhelpful. At the other end of the continuum, almost all face-to-face delivery in the Internet age can involve the use of digital tools, such as computers, digital projectors, electronic whiteboards, and email or messaging.</p> <p>The significance for TVET is that fully distance learning requires higher levels of organisational capability and teaching skills, as well as stable and reliable digital services. Online distance assessment of practical skills has been shown to be achievable, mostly using smartphone video, but requires successful adoption of competency-</p>

² Synchronous e-learning occurs when participants are learning simultaneously. Asynchronous learning occurs independently for individuals and not necessarily at the same time as other participants.

	<p>based methods and assumptions, requiring evidence of successful work/task performance rather than the knowledge-based forms of assessment (tests, essays) more common in traditional delivery models.</p>
<p>Digital literacy</p>	<p>Digital literacy is the ability to operate digital devices and the software operations driving them (UNESCO, 2018). It embraces ICT, digital media, information, and Internet literacies, and includes the ability to search, navigate, create, communicate, collaborate, evaluate and share digital content using a variety of technologies (DESE, 2020). It also involves the “safe, critical and responsible” use of technologies and an understanding of basic cybersecurity, intellectual property, and privacy laws and practices (European Commission, 2018).</p> <p>According to the Victorian Skills Authority in Australia, there are three domains of digital literacy:</p> <ol style="list-style-type: none"> 1. Digital Foundation – a basic understanding of how to use digital tools safely 2. Digital Application – the ability to apply, embed and adapt digital tools and software in work and life 3. Tech Jobs– an advanced understanding and use of digital tools, software, data, and approaches (Victorian Skills Authority, 2021). <p>The second domain is considered the benchmark for effective work in developed countries.</p> <p>Digital literacy for teachers encompasses general digital skills as well as technologies specific to teaching (such as LMSs) which can be adapted and used for the specific purposes of teaching and learning (such as web conferencing services).</p>
<p>Digital tools</p>	<p>Digital tools relevant to training and education include online learning platforms, electronic libraries, open educational resources (OER), education management applications, software applications for teaching (such as live classrooms), tools for developing learning and assessment resources (such as Microsoft Word and PowerPoint, and online editing tools), and technical support (CEDEFOP, 2022). Other tools include student support systems and social media, as well as a range of other synchronous and asynchronous communication tools.</p> <p>In this review, we use “tools” and “technologies” interchangeably to include digital hardware, software, or services, depending on the context.</p>

<p>Competency-based training</p>	<p>Competency refers to a person’s ability to consistently apply the knowledge, skills, and attributes they need to do a task or job to the standard of performance required in the workplace. Competency is evidenced by effective performance of tasks in realistic contexts.</p> <p>Competency-based training (CBT) focusses on developing a trainee's ability to achieve competency in a task, activity, or job in a specific industry discipline, as well as 21C skills and attributes, such as problem-solving, self-management, critical thinking, life-long learning, digital literacy, and innovation. Therefore, CBT is outcomes-based rather than time-based and recognises that students may have competency in some areas before they start a course, which can be recognised through a recognition of prior learning (RPL) process.</p>
<p>Competency-based assessment</p>	<p>Competency-based assessment (CBA) requires a student to demonstrate their knowledge and skills by performing authentic work tasks to the required standard as close as possible to on-job conditions. CBA is a criterion-referenced process rather than a normative-referenced approach (where a student’s performance is measured or “graded” relative to the performance of others), as in most secondary and university education.</p> <p>The standards for assessing competent performance are often defined in conjunction with industry bodies to guide the design of work-relevant training programmes.</p> <p>Assessment involves teachers and students collecting and reviewing evidence of performance of tasks and making judgements about whether a person has achieved competency according to the standards. In some countries, the requirements are organised as “units of competency”. The units provide both the learning outcomes for the training curriculum and the structural requirements for awarding qualifications.</p>

Structure of the report

1. Good practice in blended TVET

Provides an overview of the literature about good practice in:

- blended teaching and course design and delivery
- the competencies TVET teachers need to teach using digital technologies and the challenges they face in transitioning to blended learning environments
- training for TVET teachers in the use of digital pedagogies and tools.

2. Digital competencies for TVET teachers

Looks at what can be learned from:

- available digital competency frameworks for teachers
- available digital and blended skills courses for TVET teachers.

3. Developing digital capacity in TVET institutions

Provides:

- an exploration of indicative phases of readiness of TVET institutes for blended learning
- sample roadmaps for developing ICT infrastructure, systems, and specialist roles essential to effective blended learning
- potential digital technologies and tools for teachers and students for each technological phase.

4. Transitioning to digital delivery: A roadmap

Presents an overview of:

- the transition to digital delivery process for TVET institutions and systems.

5. Guidelines

Summarises the implications of the research findings, including:

- guidelines for a digital competency framework for blended TVET
- a preliminary structure of digital competencies for blended TVET to inform the development of competency standards in the next stage of the project.

1. Good practice in blended TVET

It is agreed in the literature that teaching and learning in TVET digital environments is more effective when it is collaborative (based on social or peer learning) and utilises problem- and inquiry-based learning linked to real industry problems. Learning outcomes can be improved when students experience digital simulation and a “multimedia-based showcase” of industry cases or tasks (UNESCO-UNEVOC, 2020, p. 17). Furthermore, students can communicate easily with peers, teachers, and experts, learn at their own pace, and “participate in the learning process” rather than consuming “pre-made content” (Downing et al., 2019, p. 69).

Good practice in blended learning draws on the principles of student-centred teaching (Figure 2), more so than traditional teacher-centred approaches,³ although these are important in some TVET contexts, such as when students are disengaged from education, are not ready for self-directed learning (a key requirement for online learning), or do not value peer-based learning approaches.

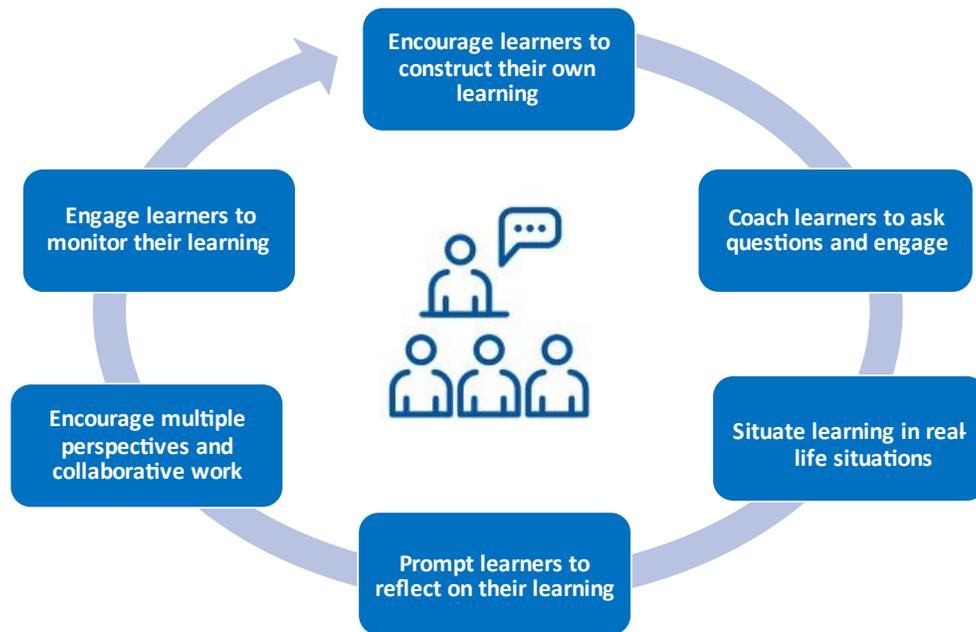


Figure 2. Student-centred teaching practices in TVET.

Source: Adapted from Bhari et al. (2021)

Student-led teaching tends to draw on constructivist learning approaches that shift a teacher’s role from instructor to “designer of learning formats, developer of materials and facilitator of learning environments” (ILO, n.d.) who guides students to:

- learn through authentic (real or realistic) tasks and activities

³ Teacher-centred teaching is described as teachers transmitting information related to a curriculum to students in structured ways, usually in lecture style (Cox & Prestridge, 2020).

- apply theoretical knowledge in practice
- formulate problems and seek solutions
- develop self-management and independent learning skills
- learn according to their personal learning preferences
- discover and create knowledge together
- form attitudes, beliefs, and values for a particular occupation
- think deeply and critically
- engage in personal reflective practice (CEDEFOP, 2015).

Teacher-led teaching methods are likely to be more appropriate in many practical and technical skill areas where satisfactory performance of agreed (and often regulated) processes and procedures is essential. Applying safe work practices in the occupations that involve physical risk, such as learning electrical skills in high-voltage work environments, is a good example.

The challenge for TVET teachers is building a new repertoire of teaching approaches appropriate to the online environment, while retaining the best of their face-to-face practices and adapting them for blended delivery. Designing and supporting resource-based independent learning has a long history in trade areas in TVET, where the exchange of training materials from various sources, including industry sources, is highly valued and sought after. Improvements in the design quality and accessibility of materials – which are both important enabling requirements for blended learning – are likely to be understood and accepted in the TVET training culture.

Other features of good blended-teaching practice (many of which apply in all teaching contexts) include:

- knowing the backgrounds of students before designing and delivering a course, including their access to the technologies they need to participate
- preparing students for online and blended classes by:
 - sending learning materials or assigning small tasks before class
 - reminding them of protocols for participation (such as being on time and behaviour rules)
 - answering questions before class starts (Samara, 2021)
- creating user-friendly digital learning experiences that allow learning to occur in multiple ways, including a variety of synchronous and asynchronous activities for students to participate in and out of class time
- staying connected with students individually and collectively during a course to:
 - monitor their engagement and participation in learning
 - provide support and encouragement when required

- manage expectations and issues that may arise
- encouraging students to learn from each other in small and large groups
- regularly obtaining feedback from students and adapting teaching and learning activities accordingly.

Asynchronous teaching methods tend to be better suited to teaching course content (cognitive learning), and synchronous methods are more suited to collaborative learning (Shank, 2020).

Challenges for TVET teachers

There are several significant challenges for TVET teachers in transitioning to the digital components of blended delivery, most of which relate to changes in role, in how they understand teaching and learning, and the level of support they receive from their institution. Table 2 describes some of the possible changes required to transition from face-to-face teaching in a classroom to blended and online delivery.

Table 2. Potential changes in TVET teachers’ work when transitioning to online delivery

Traditional face-to-face delivery	Online/blended delivery
Learning is teacher-led where the teacher transmits knowledge to students.	Learning is student-led where students take responsibility for how they learn and have a say in how learning is facilitated.
Teachers “own” how they deliver and maintain a course.	Course design and delivery are a team effort between teachers and specialists and are maintained by their institution.
Teaching, learning and assessment mostly occurs face to face in a classroom or workshop at a set time. The delivery of a course may vary considerably between teachers.	Teaching, learning and assessment can occur anytime and anywhere outside classroom settings and times. Courses published online have a consistent design and delivery plan according to quality guidelines.
Teachers develop their own assessment strategies and activities.	Assessment tasks are built into course structure (especially when training is based on standards), and some assessments are automatically marked (e.g., online tests).
Teachers develop and manage their learning materials/resources using different layouts and styles.	Course materials can be accessed from the web and modified or developed by teachers. They are then published on a course website for sharing with colleagues and students.

Traditional face-to-face delivery	Online/blended delivery
Teachers use technologies with which they are familiar.	Digital courses may utilise new technologies that need new knowledge and skills. Students may be more skilled at using digital devices and applications than teachers.
Teachers monitor student engagement, participation and progress through face-to-face observation and attendance rolls.	Teachers use digital data to monitor student engagement, attendance, participation, and progress. Authenticity of assessments can be an issue.
Teachers observe classroom dynamics and intervene when problems arise.	Monitoring interpersonal relationships online is done using observation and digital tools.
The security of data and information can be controlled in classroom environments.	The security of personal data is at risk in online environments and requires constant vigilance.

The amount of change that teachers need to make to transition to online and blended learning is often underestimated. TVET institutions around the world report strong resistance from teachers (ILO & World Bank, 2021) for several reasons, one of which is the way they were taught originally and are comfortable with (mostly face to face using teacher-centred pedagogies), which influences their beliefs (or conceptions) about teaching and how well they will adapt to digital learning environments (Cox & Prestridge, 2020). Negative attitudes to online learning often stem from a lack of knowledge of the benefits of the digital skills required in the workplace (Subrahmanyam, 2022) and not being able to reimagine the student learning experience.

When you're forced into an online mode, that's the first step ... because it challenges your traditional practices about people having to be face-to-face. (Teacher as cited in Downing et al., 2019, p. 67)

Teachers with teacher-centred beliefs tend to choose digital tools that allow them to teach that way, while student-centred teachers are more likely to choose tools that support constructivist modes of learning, but if digital learning environments are constrained, they will shift back to teacher-centred approaches (Cox & Prestridge, 2020). Other challenges impacting on motivation to transition to blended and online learning include:

- lack of access to training, incentives, and time to participate in it (OECD, 2021b)
- closely related, a lack of confidence in using digital technologies and opportunities to experiment with them (OECD, 2021b)

- teaching and assessing practical, applied learning activities. Digital learning environments tend to suit theoretical or cognitive learning more than practice-oriented learning (Subrahmanyam, 2022). Assessing online in particular, requires new methodologies that do not compromise quality
- difficulties in maintaining relationships with students. Good teaching is centred on interpersonal relationships and dialogue between teachers and students (Battro et al., 2013) and providing support and encouragement when required. This can be challenging for teachers new to digital learning environments
- developing quality digital learning resources: while teachers are subject-matter experts and know how to teach, many do not have the skills to use multimedia and other digital media tools
- creating and maintaining safe digital learning environments that keep students engaged in productive learning, which can involve managing unwanted digital behaviours (such as cyberbullying) and cybersecurity threats, which require new skills and knowledge.

A survey administered by COL to TVET teachers in 13 Commonwealth countries in 2021 highlighted further challenges for teachers regarding Internet affordability and capacity, the stability of electricity supply, and the lack of an LMS, as well as negative attitudes towards online learning among teachers and the newness of online learning for students (COL, 2021). Online security, quality and interoperability were also significant issues raised by teachers.

A major challenge is the level of ICT systems and support for teachers provided by TVET institutions (UNESCO-UNEVOC, 2020). Teachers cannot transition to digital environments in isolation. Their propensity to use digital tools is strongly influenced by the level of digitisation in their institution as well as how much support, encouragement and training they receive (Subrahmanyam, 2022). It can be very low if digital technologies are introduced without training in how to use them and if specialist support (such as instructional designers, support technicians, multimedia developers) is not available to help in the design and delivery of online components of blended courses. Without support, teachers quickly become frustrated and disillusioned with their online efforts (Downing et al., 2019).

Good practice in training TVET teachers

Professional learning programmes for TVET teachers aimed at building digital competency range from formal courses for pre- and in-service teachers, often based on teaching standards, to short courses or self-directed research and ad hoc experimentation (Subrahmanyam, 2022). The literature shows that small, flexible and scaffolded units of learning over time can be more effective in building digital capability in teachers than intensive upfront blocks of training because they allow teachers some time to practise and experiment with technologies as they learn (Subrahmanyam, 2022). “Loading up” teachers with digital skills at the start of their teaching course does not build deeper understandings of digital teaching and its benefits and drawbacks

for students, nor does it develop a digital “mindset” towards innovations in teaching, although this can be difficult to incorporate into digital standards (Falloon, 2020).

An experiential learning approach that positions teachers as students in digital environments can be effective in building a deeper and broader knowledge and understanding of online learning and what good practice looks like from the perspective of both teacher and student. TVET teachers who have been online students tend to be more student-centred (better at creating a friendly, social learning environment, developing group cohesiveness and rapport with each student) than teachers who have not (Cox & Prestidge, 2020). However, it is not always easy to model good teaching practice online (Downing et al., 2019).

The digital expertise of teacher-trainers is clearly critical to building confidence and enthusiasm among teachers about blended learning and to changing the attitudes of those reluctant to adopt digital teaching methods. Games and other digital software can make training more fun and engaging (UNESCO, 2020), showing how different digital tools can be used for learning. Professional networks and communities of practice have also proven effective in supporting teachers to build digital confidence and competency (Subrahmanyam, 2022).

Teachers new to blended and online learning can learn from more experienced teachers and call on them when they have questions or run into problems. Networks, therefore, provide informal technical and pedagogic support as well a mechanism to share new digital practices and resources. This, too, can prevent negative attitudes towards technology that arise when problems are not readily resolved (Subrahmanyam, 2022).

A proven strategy for building digital capability of TVET teachers working in low- to medium-technology settings is developing a blended course using a structured project methodology (with a budget, nominated project manager and timeline) with a team of teachers.

2. Digital competencies for TVET teachers

New requirements for blended delivery

To teach the online component of blended-delivery courses, TVET teachers need a suite of new competencies and attributes. Blended courses and resources are designed differently from those delivered in traditional face-to-face classroom modes, which means traditional modes do not directly translate into digital alternatives. New thinking about curriculum design, teaching, sharing of information, communication, how students experience online learning, and how they can be supported is required.

Teachers need to know:

- how learning occurs in digital environments
- how to make learning collaborative in those environments (UNESCO, 2018)
- which digital tools available to them are suitable for each teaching and assessment activity
- how to create and maintain safe and inclusive digital learning environments
- how to source and/or create digital learning resources
- how to develop their own and students' digital literacy.

They also need:

- a positive attitude towards online learning, including believing in its positive impacts and a willingness to adapt to and create change
- creativity using digital tools to deliver and assess both theoretical and practical TVET
- communication and leadership skills to encourage students' skills, talents and creativity (Samara, 2021).

Some sources argue that teachers need to be able to plan and organise their digital teaching and learning activities within an *integrated instructional system* (UNESCO-UNEVOC, 2020). In this view, TVET teachers need these new competencies at every stage of the teaching system as well as the ability to:

- design an instructional plan that integrates digital tools and practices to meet the needs of specific students in a safe and inclusive learning environment
- deliver using experiential and peer-learning approaches, which involves managing groups online, keeping students engaged, and fostering teamwork and collaboration
- assess outcomes using digital tools and providing feedback
- evaluate a course using digital data and feedback
- engage in continuous improvement through ongoing reflection on digital practices and professional learning.

Teachers with low pedagogical knowledge and capabilities are less likely to be able to do this effectively (UNESCO-UNEVOC, 2020).



Figure 3. Integrated TVET teaching system.
Source: Adapted from UNESCO-UNEVOC (2020, p. 13)

Digital competency frameworks

Several digital competency frameworks are currently in use for teachers in all education sectors. A comparison of some, provided in attachment 3, shows that most focus on the ability of teachers to integrate technological knowledge, understanding and skills into pedagogy and curriculum to improve outcomes for students – including building students’ digital literacy – and continually monitoring and evaluating the quality of their delivery.

The main competencies listed in the frameworks can be divided into two groups (Table 3):

Table 3. Competencies common to most frameworks

Teaching competencies	Designing curricula and instructional plans Developing digital resources and content Teaching using digital devices and tools Assessment using digital tools Supporting and empowering students Communicating with students Creating safe and inclusive digital learning environments Facilitating student digital competence
General competencies and attributes	Digital mindset Operation of digital devices and organisation systems Ethical and safe use of technology Information and data literacy Professional engagement Data analysis and management Collaboration with peers Digital maintenance and organisation Personal professional development

Levels of digital competency

All the frameworks list a learning and development pathway for TVET teachers learning how to use digital technologies in their teaching and are usually between one and five competency levels. For example, UNESCO-UNEVOC (2020) outlines four stages:

- **Emerging:** basic digital skills and knowledge to teach content
- **Applying:** blending digital tools and technologies into teaching practices without making significant changes to those practices
- **Infusing:** using an array of digital tools, technologies and resources to deliver course content and manage students' use of technology for assigned learning activities
- **Transforming:** experimenting with new digital tools and pedagogical approaches.

The European Framework for the Digital Competence of Educators (DigCompEdu), UNESCO ICT Competency Framework for Teachers (2018), and the Digital Teaching Professional Framework (DTPF) articulate three stages or levels.

The ILO (2021) provides an example of what levels of competency in the use of Moodle might look like (Figure 4).

FIGURE 18 WHAT CAN YOU DO WITH MOODLE?	
Progressive teacher/trainer uptake of Moodle functions Moodle tool names ("modules") shown in blue	Increasing learning delivery options
Level 4 Remote delivery 15 Provide fully online courses, webinars Virtual classroom (web conferencing service) (<i>plugin</i>)	Online learning 
Level 3 Collaborative group learning 14 Engage in active research, communities of practice 13 Leamer: author course <i>Ressources</i> 12 Leamer: use <i>Webpage</i> , <i>Survey</i> tool and <i>Logs</i> to study	Blended learning 
Level 2 Interactive web-based teaching & learning 11 Provide live online support with Virtual Classroom (<i>plugin</i>) 10 Introduce external <i>Activies</i> and <i>Games</i> 9 Add self-paced modules with <i>SCORM</i> , <i>IMS</i> 8 Combine <i>Activies</i> into sequences (authoring) 7 Facilitate discussion in (active) <i>Forums</i> 6 Use <i>Wikis</i> , <i>Glossaries</i> , <i>Databases</i> for collaboration 5 Use interactive <i>Quizzes</i> and <i>Assignments</i> 4 Connect your leamer group through <i>People</i>	Web-enhanced face-to-face 
Level 1 Basic course access & administration 3 Provide a (passive) <i>Forum</i> for the group 2 Publish course docs, 24/7 access (<i>Resource</i> , <i>Lesson</i>) 1 Manage online course administration (<i>Calendar</i> , <i>Events</i>)	Face-to-face

Figure 4. Example of digital competency development using expanding Moodle functions.

Source: Authors in ILO (2021, p. 55)

A list of some digital courses and resources currently available for teachers is provided in attachment 4.

3. Developing digital capacity in TVET institutions

While digital competencies for TVET teachers do not differ greatly across locations, their access to digital technologies does and depends heavily on their local ICT context, which, in turn, depends on the level of ICT infrastructure and systems in their institution and country (UNESCO, 2018). A local perspective is important, as Internet and electricity services may be reliable in cities in a country but not in rural or remote locations.

Levels of digitisation: Country contexts

The Commonwealth countries that may implement a digital competency framework for TVET teachers vary significantly in population size and rates of urbanisation, which impacts on the reliability and availability of services. Variability in Internet usage by students at home across a range of countries, illustrated in Figure 5, shows that high numbers of students do not have access, especially in sub-Saharan Africa (up to 80%) and in Asia-Pacific countries (50%).

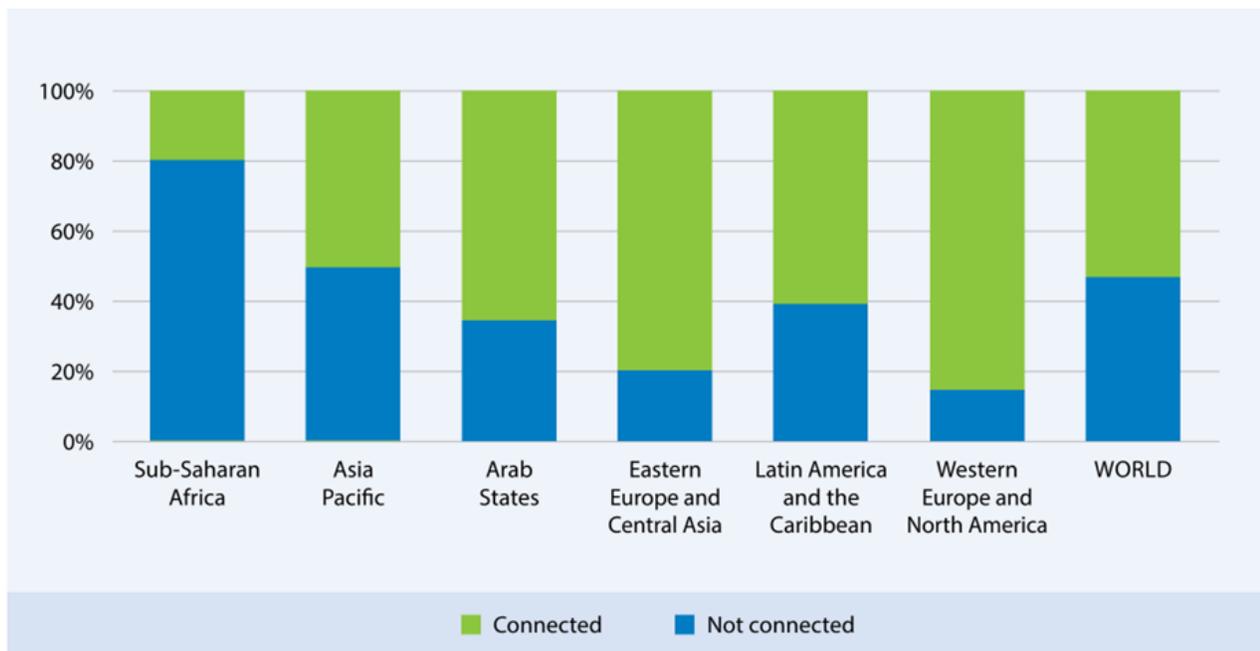


Figure 5. Percentage of students with Internet connection at home in 2019.

Source: Subrahmanyam (2022)

Internet usage varies significantly within these regions. In sub-Saharan Africa, Internet use is high in Botswana (around 65% of the population) but very low in Malawi (Figure 6). As a benchmark, the percentage of individuals using the Internet in OECD countries is almost 90%. The number of secure Internet servers is low in these countries, which suggests the availability of technical workers to support and maintain digital systems and applications is also very low.

However, the number of cellular subscriptions is much higher than fixed broadband subscriptions. Reporting for UNESCO, Subrahmanyam (2022) recently estimated the number of mobile phone

connections in sub-Saharan Africa to outnumber connections to the electricity grid. This suggests that people are accessing the Internet using mobile phones, which means that teachers and students are more likely to be familiar with the interfaces and navigation of digital phones than computers. It may be the only way to communicate and send learning resources to students, especially in rural and remote areas of these countries. In addition, costs of mobile broadband have fallen in these countries, making mobile education more affordable than online education using fixed broadband.

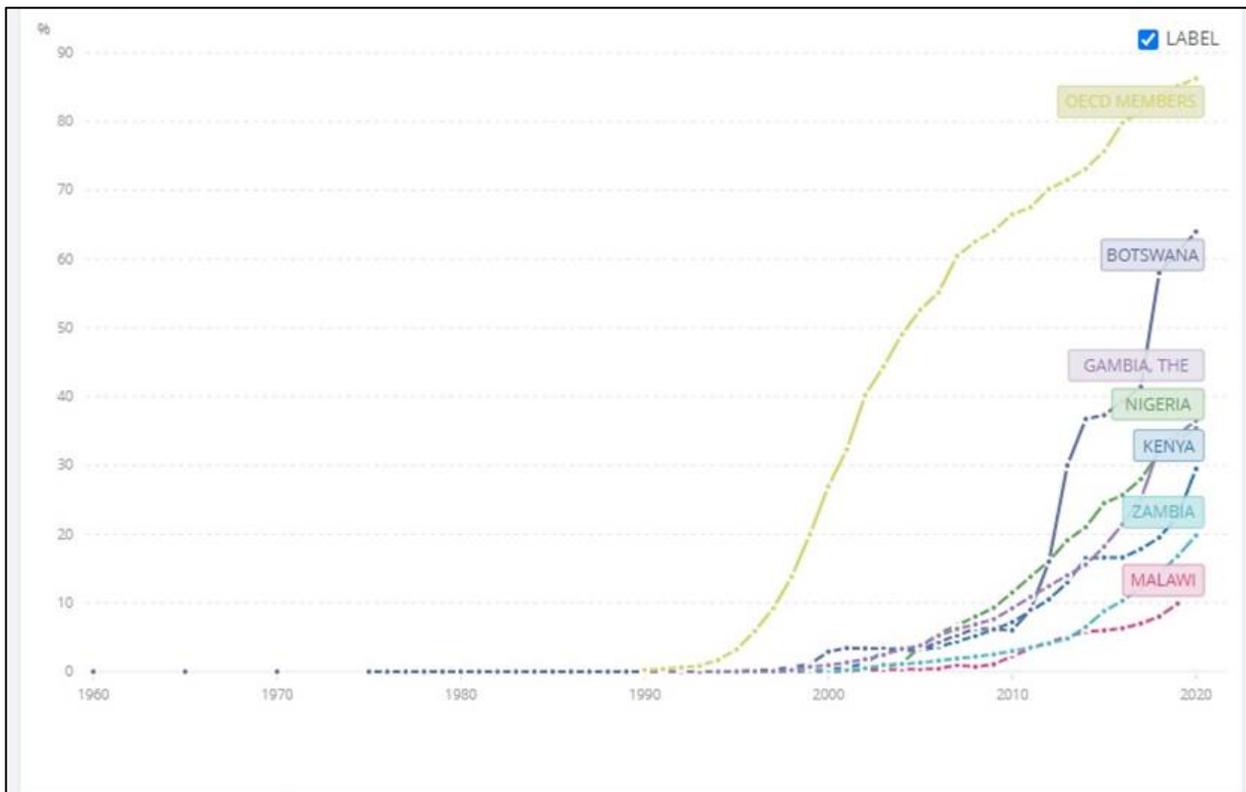


Figure 6. Percentage of population using the Internet in selected countries.

Source: [World Bank](#) (2022)

Digital capacity at TVET institute level

The level of digitisation in a country directly impacts on the ICT infrastructure and systems in TVET institutions (UNESCO, 2018) and the type of digital tools they can use for blended learning. We have developed a preliminary grouping (low, medium, and high) (Table 4) to describe typical technology settings based on *COL's Introduction to Blended TVET* survey (COL, 2021) and other sources.

Table 4. TVET institution technology settings

Level of technology maturity	Features of technology settings
1 Low technology capability/start-up phase	<ul style="list-style-type: none"> • very little Internet available and low speed service • some mobile device usage, but very few computers • no LMSs in TVET institutions • no institutional digital support for teachers and students • no online business administrative systems • no digital data collection system
2 Medium digital capability	<ul style="list-style-type: none"> • Internet available, but limited and often unreliable access • extensive use of mobile phones • some digital business systems in TVET institutions (e.g., enrolment, credentials) • LMS available, but limited courses, only basic features • some use of web-based classroom tools • some digital competencies among teachers and students • some student access to computers • some digital tools for the collection of data
3 Mature digital technology system	<ul style="list-style-type: none"> • strong and reliable Internet services available • most teachers and students have mobile phones and computers • well-established ICT systems, including student management systems and LMSs • a digital mindset in TVET planning and operations • strong institutional support for teachers with help desk, instructional designer graphic, audio–video support roles • complex digital tools used in teaching (e.g., VR, IR and gamification) • digital systems for students (help desk, intranet, e-tutoring) • complex data collection and analysis software for quality purposes

Figure 7 provides an example of a digital infrastructure and systems in a mature TVET institution. The functionality, tools and resources available in an LMS are central to the quality of blended learning (ILO & World Bank, 2021). It needs video capability and fit-for-purpose virtual classroom service for scheduling and supporting facilitated group learning online (ILO, 2021). Mature systems also benefit from curated digital repositories to store for learning resources and other information to support teachers to share digital practices and support professional learning.

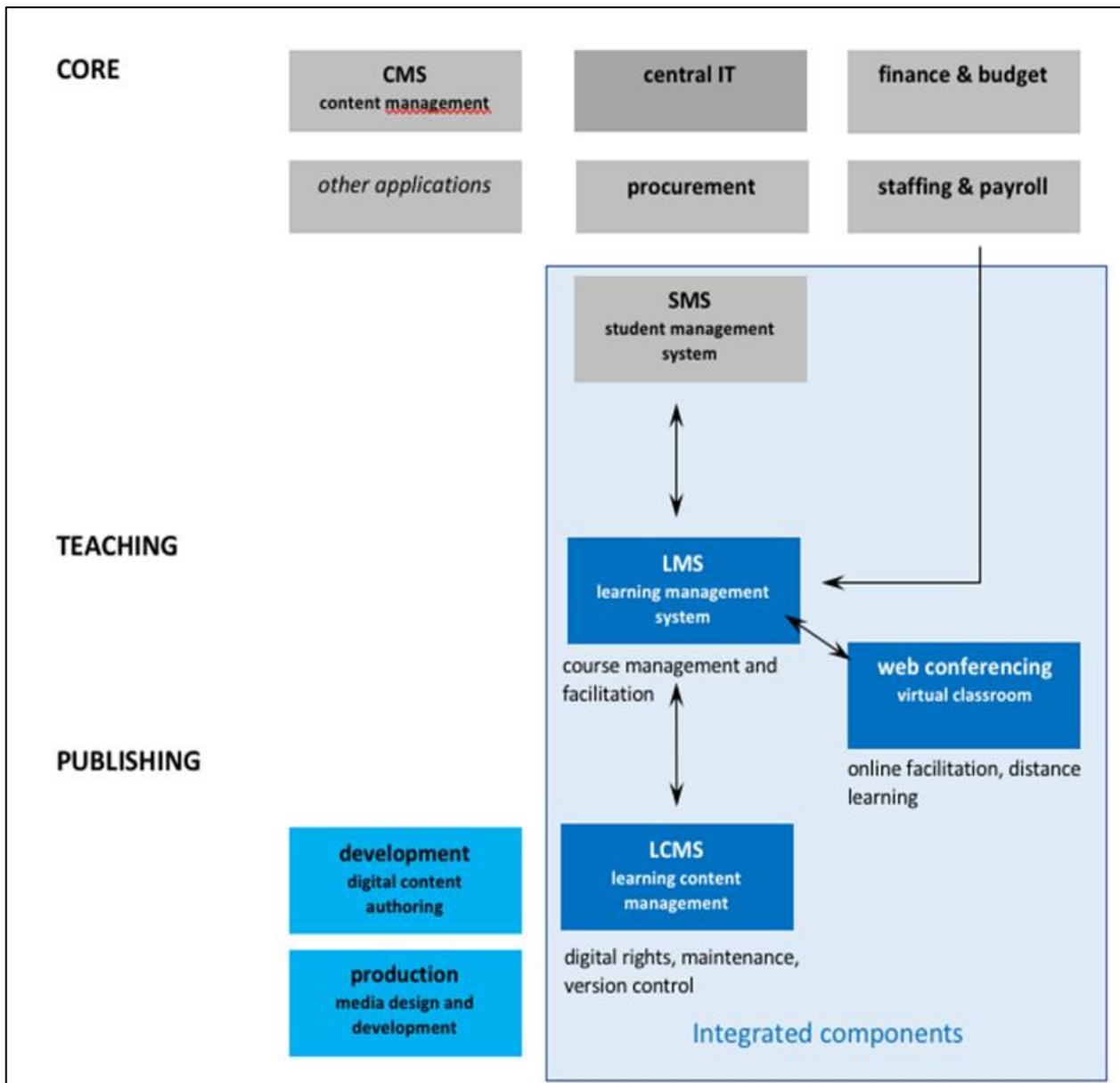


Figure 7. Key functions and applications of a mature educational digital platform.

Source: Authors

Blended delivery capability of institutes

The survey conducted by COL during COVID-19 shows that over one-third (38%) of respondents were delivering some form of online learning, and 9% were using some online assessment (COL, 2021). Most of the online delivery reported was in ICT, education, communication, remedial English, hospitality and food and beverage, construction, and electrical courses at either certificate or diploma level. Almost one-fifth (19%) of teachers were new to online teaching, and 7% responded they were still in the planning phase with their institution installing an LMS.

Commonly used digital tools for blended delivery

Almost all respondents (90%) to COL's survey had some access to an LMS to deliver online components of a course, with almost 80% (78%) also using face-to-face teaching in a classroom or workshop. The most used technology devices were laptops and computers (94%), followed by mobile phones and tablets (84%).

Commonly used digital tools included online quizzes (especially with self-assessment activities and built-in feedback), e-portfolios, discussion forums, live online classes, podcasts, video conferencing, videos, digital texts, and publicly available websites. Microsoft Teams, Moodle, Zoom, Facebook, and WhatsApp were commonly used, but broadcasting live on television or streamed videos were not common. The most used digital communication tools were email, WhatsApp, and Facebook, as well as Zoom which, in some cases, was utilised by teachers to demonstrate practical tasks and to observe students completing practical assessments. Videos and photos were used widely for online assessment, but e-portfolios were less widely used.

At the moment, we are using Google Classroom for assessments, Google Meet for online synchronous sessions and WhatsApp Groups to communicate with trainees. (TVET teacher respondent, COL, 2021)

In Singapore, a survey found that teachers were using audio-visual tools such as Smartboards and videos, as well as collaborative platforms, although these were mostly used asynchronously for knowledge transmission rather than for deep learning (Chen, 2019).

The surveys show that little support is provided by TVET institutions for teachers. Less than one-third (31%) indicated that support was provided to install, use and manage digital tools and services, while 25% had computers, laptops, tablets and/or mobile phones provided by their institution. As mentioned earlier, TVET teachers need a range of specialist roles to support them to design and deliver blended learning. Figure 8 provides examples of some roles in mature TVET institutions.

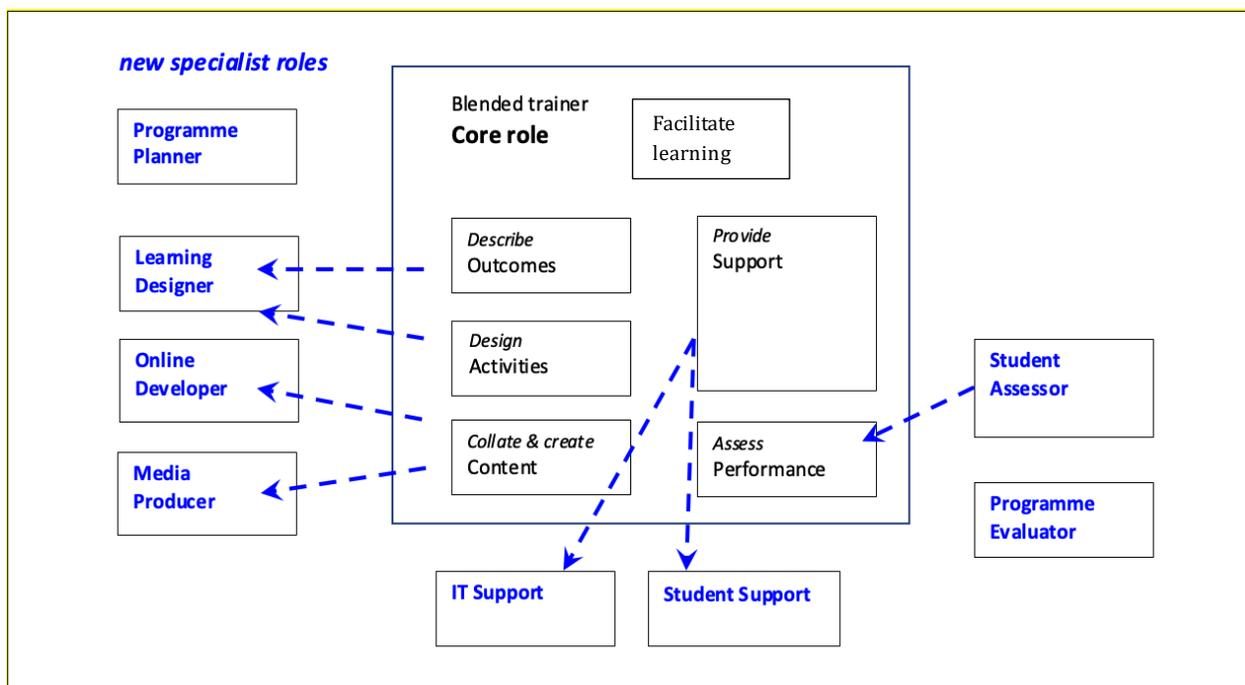


Figure 8. Specialist roles in educational institutions with mature online capability.

Source: Authors

Details of the roles are provided in attachment 5.

It is unrealistic to expect TVET teachers to have or to develop all the competencies required to support digital components of blended learning. Some teachers may want to grow their expertise in a particular digital area, such as learning design, resource development, or online facilitation. The diagram, therefore, also represents potential career pathways for these teachers.

Digital technologies for low-technology settings

TVET institutes in developing countries and/or low-technology settings are unlikely to have this level of resourcing, specialist skills or digital infrastructure and may need to bring in external expertise to train a team of core specialists to start the development process.

Specialist skills

In the beginning, core specialist expertise is usually required in:

- **learning design:** course designs for resource-based, online and competency-based teaching
- **content development:** preparing the modified, more extensive learning materials for online needs
- **IT support:** installing and using tools, loading courses (e.g., to a Moodle site), providing help to users

- **digital learning resource development:** including multimedia and audio.

Free web tools

There is a wide range of mobile and web-based tools that can be used for teaching and learning, many of them freely available on the Internet for TVET teachers and institutes to experiment with (Table 5).

Table 5. Possible digital tools for low-technology settings

Teaching activity	Purpose	Examples of digital tools
Instructional design and resource development	Developing digital documents and presentations	Word, Excel, PowerPoint
Collaborating with peers	Sharing documents with other teachers	Google Docs, Basecamp, SharePoint
Synchronous online group learning activities	Web conferencing Discussion forums	Zoom, Teams, Google Classroom, Skype
Asynchronous online group learning activities	Discussion forums	LMS (Moodle), social media
Providing support and encouragement for students	Communication with students	WhatsApp, email, SMS, social media
Sharing information with students	Online document repository Online calendars	Google Docs, Basecamp, SharePoint, Google calendars
Assessment	Observing demonstration of competency	REALTO ⁴ Mobile phone video and photos
Networking	Maintaining professional relationships	LinkedIn, Facebook

⁴ REALTO was developed by the École Polytechnique Fédérale de Lausanne to bridge the gap between school and workplace learning contexts. It provides a digital learning space and platform for students to upload photos, videos, audio and texts of their experiences in the workplace (UNESCO-UNEVOC, 2020, p. 18).

Figure 9 illustrates some of the function groupings of digital tools available on the Internet that can be used by teachers who have access to the Internet but not to an LMS.



Figure 9. Typology of web-based learning technologies.

Source: Bower and Torrington (2020)

Digital tools that can be available to teachers with access to higher levels of technology include:

- video game-based tools
- immersive tools (such as augmented reality [AR] and virtual reality [VR]), which are increasingly being used to create simulated workplaces in work-based training and assessment
- artificial intelligence (AI) tools, which are used for student support and feedback through chatbots to detect plagiarism and for administrative tasks associated with teaching (ILO, 2021).

4. Transitioning to digital delivery: Some roadmaps

Training teachers and digital specialists in blended learning will not in itself transform an institution. Their training is part of an overall commitment to blended learning at all levels of management, led by the top levels, and usually requires planned simultaneous change in several areas:

- planning and policy, especially in change management
- e-business strategies and initiatives
- teaching and learning design and delivery
- marketing
- work processes and systems (including conditions of work)
- facilities and equipment, especially ICT
- Internet services
- organisational structures to accommodate new roles, support systems and services.

Introducing online learning involves complex and interlinked changes in workplace culture, investment in new infrastructure or modification of existing facilities, redesign of institutional work practices and processes, updates to business policies, procedures and protocols (including cybersecurity, e-safety, student support), creation of new roles and professional development of current staff to fill them, and new approaches to marketing. Educational institutions with a history of distance education generally make the transition to these practices more smoothly (Downing et al., 2019).

Table 6 provides an example of the implementation sequence, although this process does not always occur sequentially. Also, the availability and popularity of open-source LMS software (Moodle) have enabled some institutes to jump straight into instructional management (and blended delivery) functions, normally a second-stage addition after core administrative functions.

Table 6. Likely implementation sequence of digital systems in TVET institutions

Source: ILO (2021, p. 14)

	First stage (start-up)	Second stage (expanding)	Third stage (integrated)
Core administrative functions	Central ICT Finance Procurement	Human resources Facilities and operations management Management (teaching departments)	
Client services and teaching functions	Library Enrolments, admissions, recruiting Credentials	Instructional management (likely to be an LMS) Teaching (likely to include scheduling, class allocation, attendance, etc.)	
Strategic and external relationship functions		Partnerships (corporate, employer).	Institutional strategic planning Promotion and tenure Partnerships (community)

Establishing central ICT systems is essential to making this transition possible. The readiness of TVET institutions to achieve online learning is largely determined by the effectiveness of the implementation of four core systems:

- learning management systems
- assessment records systems
- content development systems
- live classroom services (ILO, 2021).

Initial expertise in core specialist roles – which may need to be brought in externally to begin with – is required in learning design, course content development, ICT support, and digital learning resource development (including multimedia and audio).

Cost and lack of expertise are the main reasons why TVET institutions do not adopt learning technologies (Chen, 2019) or withdraw resources (such as educational developers, technology experts and experienced online facilitators) after digital systems are initially established

(Downing et al., 2019). Cultural change is the other major challenge when transitioning to online learning due to the disruptive nature of the transition. Lessons from the field show that transitions are more successful if leaders have understood what changes people need to go through first (ILO, 2021).

Rapid change models

The complexity of organisational change does not necessarily imply an extended and potentially laborious process for whole-of-organisation change.

Figure 10 provides an overview of a rapid transition process developed for private training providers in Australia. The approach is based on identifying up to three initial courses with high chances of success (“e-opportunities”) to be developed by a small, hand-picked project team.

The example of the early success is used to drive change and build skills in the process. This agile management approach and entrepreneurial work culture may be hard to replicate in larger institutional settings, however.

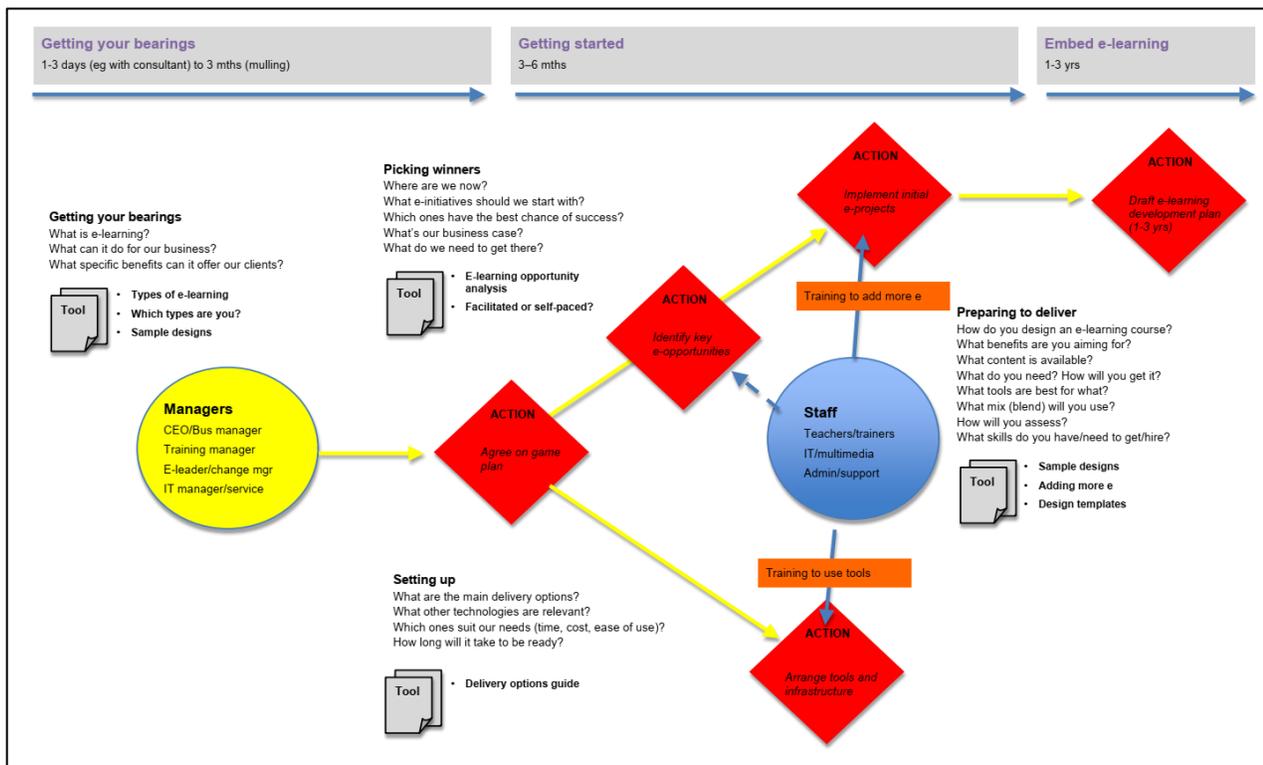


Figure 10. Rapid digital transition process for private training providers.

Source: Authors

Case study

Project-based change at YTEPP

Another example of a rapid change model is YTEPP, a TVET provider in Trinidad and Tobago. The organisation converted all its TVET courses to blended mode between 2017 and 2022.

A key ingredient was *careful selection of the first course* (a Life Skills short course) for success, including identifying a charismatic teacher who had embraced digital technologies and promoting the project's success to drive change.

The project was *accelerated by COVID* – the team simply replaced face-to-face sessions with virtual classes and went fully online until restrictions were eased. Another defining feature of the model was reshaping the Life Skills teachers' roles to be “*subject matter experts*” who work together in a course team to choose the best of available materials and clarify what learning activities work best. Online assessment of practical competencies was achieved using student videos of performance.

The team was supported by an *instructional designer* (who was also the project manager), a *Moodle person* with website design skills, and a graphic designer. The members of the initial team were then allocated to new course projects, a “*snowballing*” strategy to build on workplace skills to move into other areas, from hospitality through to the more resistant trade technical subjects.

The project has been widely publicised and has won a presidential award.

System level change

At a system level, various measures need to be put in place to develop the capacity of TVET teachers and their institutions for technology-enabled teaching. In OECD countries, for example, these included:

- providing new, self-learning tools on online and blended learning for practicing teachers
- building teacher networks and communities of practice with a focus on online and blended teaching and related ICT skills
- providing targeted digital training programmes
- including digital learning content and ICT skills as part of initial teacher education programmes
- reforming quality assurance rules and procedures to accommodate an increased use of online and blended delivery
- providing additional resources to pay teachers to train in online and blended teaching and to cover the costs of backfilling their teaching duties (OECD, 2021a).

In Africa, UNESCO implemented the Pan African Initiative for Digital Transformation of TVET and Skills Development Systems in 2021 using five key strategies:

- capability building through a training programme
- a National Network for Digital Transformation, promoting digital transformation in TVET
- establishing a Regional Centre of Excellence for digital transformation in each Regional Economic Community (REC)
- data-sharing through a digital platform (ILO, 2021).

5. Guidelines for a blended TVET competency framework

The immediate purpose of this review is to provide an evidence-based foundation to guide the development of digital competency standards for TVET teachers for use in blended TVET. The primary audience is the trainers responsible for pre- and in-service training for TVET teachers in Commonwealth countries and teachers seeking to upgrade their digital knowledge and capabilities.

Findings from the review

The main messages we have identified to carry forward into the development of the digital competency standards for TVET teachers and the accompanying toolkit for teacher-trainers are:

Focus on the new work processes for teachers

The standards should address the specific tasks, requirements and skills for using digital technologies to deliver blended courses in TVET and not duplicate other curriculum or outcomes of existing teacher preparation and professional development programmes.

Identify core digital skills for working in TVET

In addition to the professional-level skills required to prepare and deliver blended courses, the standards should indicate core tasks using digital technologies which TVET teachers should be capable of in the work setting.

Align competencies with stages of organisational development

The standards should be adaptable to differing levels of digitisation and organisational capability, including the less developed digital systems found in developing country settings.

Address the change in the role of teachers

The standards need to provide clarification and recognition of the significant change process for teachers to adapt to blended delivery – in particular, the change to student-led, resource-based learning, the different processes needed to design and develop online materials, and the need to work in teams to utilise specialist skills.

Clarify the new specialist skills required for blended delivery capability

The standards need to acknowledge and describe the emerging specialist roles generated by blended learning, with the competency statements flexible enough to accommodate teachers developing the specialist skills or specifying new positions to recruit non-teaching specialists.

Provide examples of TVET blended courses

Especially in the toolkit, provide examples of current blended delivery practices in TVET across different TVET industry areas, reflecting the wide range of teaching methods and

learner settings in TVET that can accommodate, where possible, different learning styles and preferences.

Incorporate relevant sustainable development goals (SDG) from the United Nations' 2030 Agenda for Sustainable Development

In particular, quality education (SDG 4), gender equality (SDG 5), combating climate change (SDG 13) and reducing inequalities (SDG 10).

Potential uses for digital competency standards

Table 7 provides a preliminary outline of potential uses for digital competency standards for TVET teachers.

Table 7. Potential uses for the draft digital competency standards for TVET teachers

Sections of the standards	Potential use and application
1 Core digital literacy competencies	<ul style="list-style-type: none"> • For the professional development of all TVET practitioners (teaching and non-teaching) in the safe and effective use of organisational digital systems and basic digital tools for work • For inclusion in TVET courses to develop the digital literacy of students
2 Core digital teaching and learning competencies	<ul style="list-style-type: none"> • For the design of professional development programmes for TVET teachers in the safe and effective use of digital tools in online and blended teaching approaches • For the professional development of trainers of TVET teachers • For the recruitment and induction of new TVET teachers • For performance review and career planning
3 Advanced digital competencies (higher levels of digital competency)	<ul style="list-style-type: none"> • For the professional development of TVET teachers seeking to move into specialist blended delivery roles in their institute, such as educational design or leadership roles • For the development of position descriptions for specialist digital roles • For the recruitment of specialist digital teaching and non-teaching practitioners

- For the development of non-teaching practitioners seeking to move into specialist digital roles

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Attachments

1. List of Commonwealth countries

- Antigua and Barbuda
- Australia
- Bahamas, The
- Bangladesh
- Barbados
- Bermuda
- Belize
- Botswana
- Brunei Darussalam
- Cameroon
- Cyprus
- Dominica
- Eswatini
- Fiji
- Gambia, The
- Ghana
- Grenada
- Guyana
- India
- Jamaica
- Kenya
- Kiribati
- Lesotho
- Malawi
- Malaysia
- Maldives
- Malta
- Mauritius
- Mozambique
- Namibia
- Nauru
- New Zealand
- Nigeria
- Pakistan
- Papua New Guinea
- Rwanda
- St. Kitts and Nevis
- St. Lucia
- St. Vincent and the Grenadines
- Samoa
- Seychelles
- Sierra Leone
- Singapore
- Solomon Islands
- South Africa
- Sri Lanka
- Tanzania
- Tonga
- Trinidad and Tobago
- Tuvalu
- United Kingdom
- Uganda
- Vanuatu
- Zambia

2. Research methodology

The research was conducted in three stages:

A review of the literature relating to:

- good teaching practice in blended TVET learning environments and in developing digital capabilities
- digitisation pathways for TVET systems and institutes.

A comparative review of:

- existing digital teacher competency frameworks (see attachment 3)
- available courses on digital skills for TVET educators
- case studies on developing digital competencies and systems for blended TVET and successful digital implementation in COL countries.

An analysis of levels of digitisation in each country, including:

- a review of available data on the Internet, social media and LMS distribution in selected countries
- interviews with TVET institutions in sub-Saharan African countries on current use of technology and capability needs and challenges
- a survey administered to stakeholders in each country to clarify technology contexts and competency needs of teachers.

The research questions were as follows:

- What does good blended teaching practice look like in TVET environments?
- What is the process for preparing and delivering blended TVET courses?
- What are the main challenges to digital delivery for TVET teachers?
- What are the main capabilities TVET teachers need to teach blended learning?
- What TVET teacher competency frameworks and digital capabilities exist?
- Which frameworks (or parts thereof) might apply in low-technology settings?
- What courses in blended and/or online learning already exist for TVET teachers?
- What competencies are essential to a digital competency framework?
- What are the specific digitisation contexts needs in each country?
- What digital technologies are currently being used?
- What are the main needs for system and capability development?

3. Digital competency frameworks

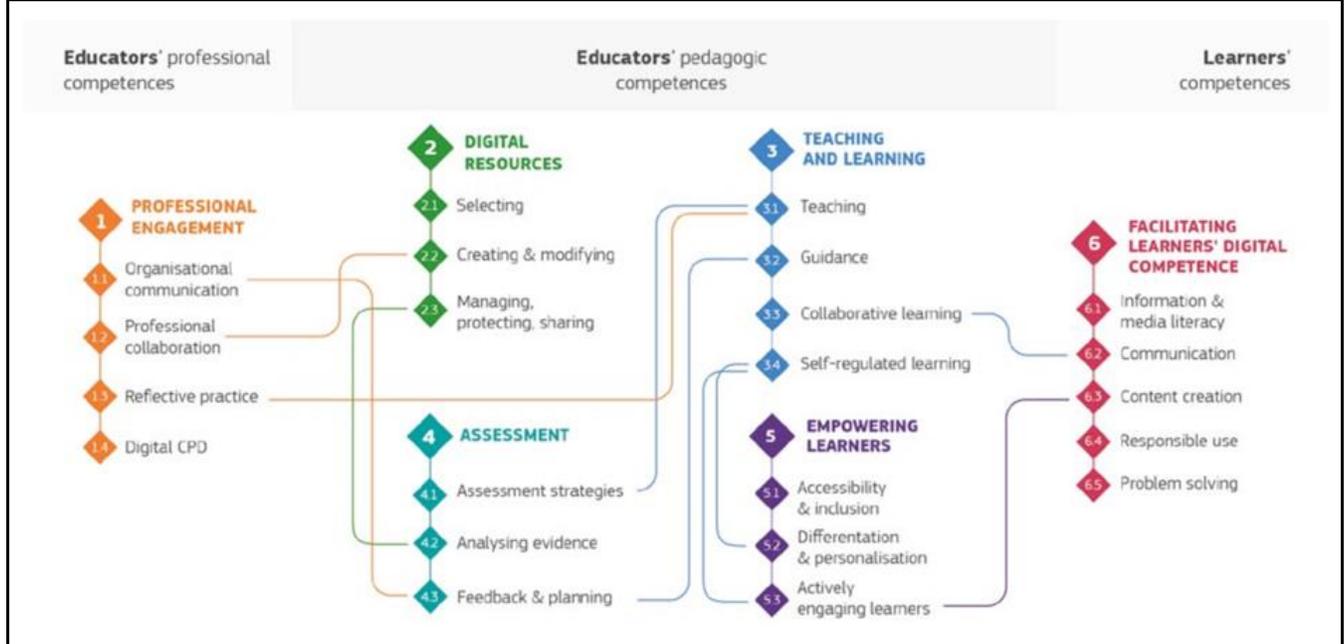
There are several digital competency frameworks for teachers across education sectors around the world.

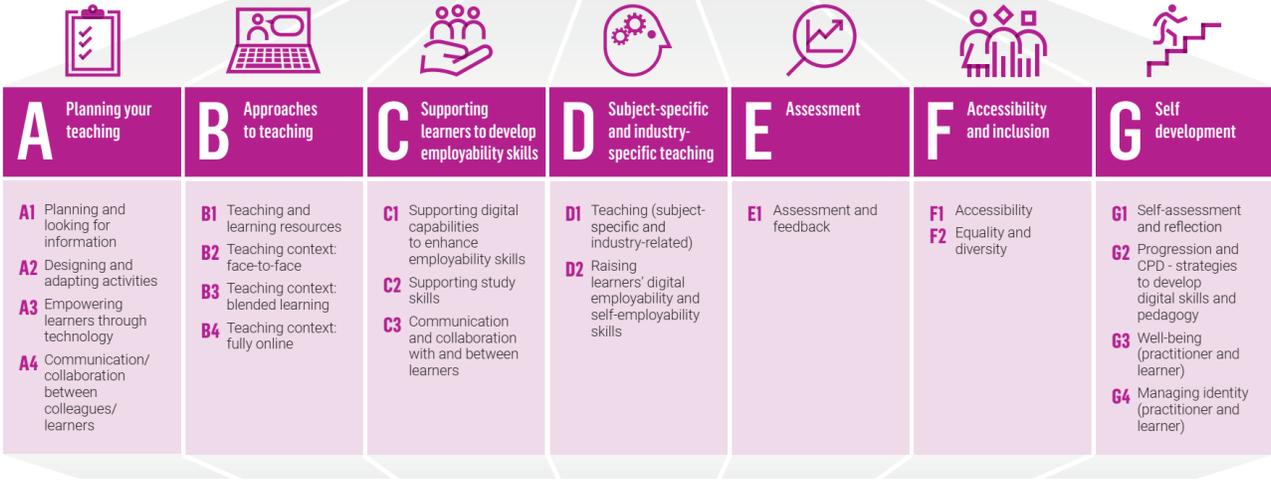
The frameworks consulted for this project include:

- [European Framework for the Digital Competence of Educators](#) (DigCompEdu)
- [EFT Digital Teaching Professional Framework](#) (DTPF)
- Professional Standards for Teachers and Trainers in the Further Education and Training Sector (UK)
- [UNESCO ICT Competency Framework for Teachers](#), V3 (2018)
- Promoting quality in TVET using technology (UNESCO-UNEVOC, 2020)
- [Technological Pedagogical Content Knowledge](#) (TPACK)
- Australian Agricultural Workforce Digital Competency Framework
- [Malaysian Qualifications Agency TVET Teaching Competencies](#)
- [Rwanda ICT Essentials for Teachers](#)
- Australian Unit of Competency, TAEDEL405: Plan, organise and facilitate online learning
- [Common Digital Competence Framework for Teachers](#) (Spain)

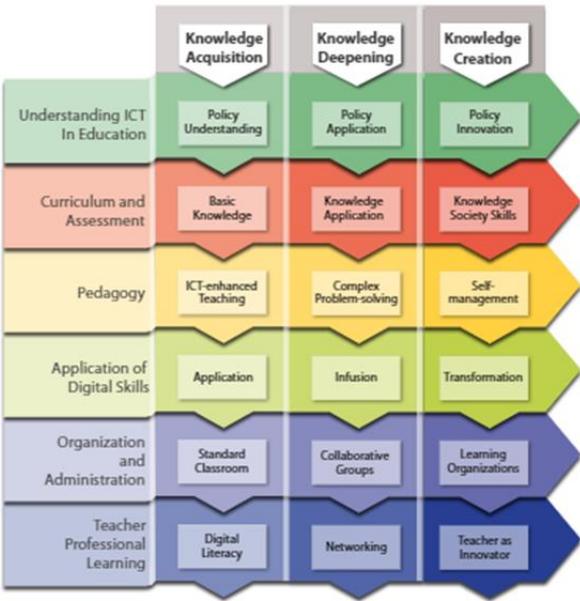
The main features of each source are summarised in the tables below (p. 39–51).

Framework	Digital competencies	Comments
<p>European Framework for the Digital Competence of Educators (DigCompEdu)</p> <p>One of the most commonly used frameworks. For teachers at all levels of education.</p>	<p>DigCompEdu has 22 digital competencies grouped under six areas of teachers' activities, which are, in turn, grouped under three main headings:</p> <ol style="list-style-type: none"> 1. Professional competencies 2. Pedagogic competencies 3. Learners' competencies 	<p>A strong focus on student-centred teaching practices (area 5) . It also provides a self-assessment instrument.</p>

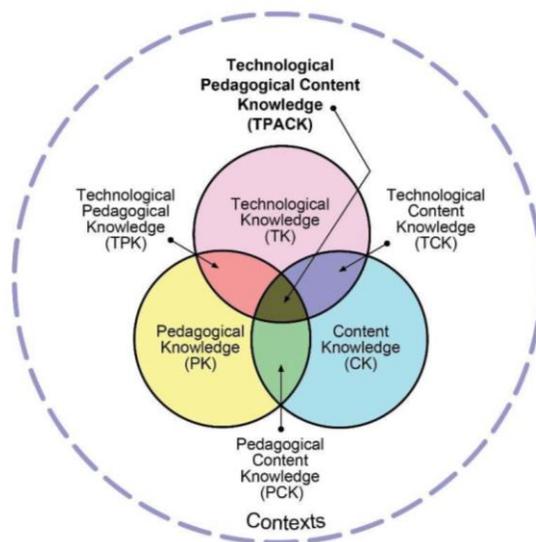


Framework	Digital competencies	Comments
<p><u>Digital Teaching Professional Framework (DTPF)</u></p> <p>For teachers in the Further Education (FE) sector in the United Kingdom, which includes seven competencies.</p> <p>For pre- and in-service TVET teachers.</p>	<ol style="list-style-type: none"> 1. Planning teaching 2. Digital approaches to teaching 3. Supporting learners to develop employability skills 4. Subject- and industry-specific teaching 5. Assessment 6. Accessibility and inclusion 7. Self-development <p>Levels of competency</p> <ol style="list-style-type: none"> 1. Exploring 2. Adopting 3. Leading 	<p>Each competency is adapted from DigCompEdu and mapped to the Professional Standards for FE Teachers (below).</p> <p>This framework better reflects the TVET teaching system and focusses on industry and provides examples for how it can be used. It is also accompanied by small, accredited, online units of training that go towards a badged qualification and a self-assessment tool for teachers.</p>
		
<p><u>Professional Standards for Teachers and Trainers in the Further Education and Training Sector</u></p> <p>UK</p>	<ol style="list-style-type: none"> 1. Professional Values and Attributes 2. Professional Knowledge and Understanding 3. Professional Skills 	<p>This Framework underpins the DTPF and covers general competencies for TVET teaching.</p>

Framework	Digital competencies	Comments
<p><u>UNESCO ICT Competency Framework for Teachers (2018), Version 3</u></p> <p>For pre-service and in-service teachers from K-12 to tertiary level.</p> <p>Aimed at teacher-training personnel, educational experts, policymakers, teacher support personnel and professional development providers.</p>	<p>The ICT-CFT has 18 competencies organised across six main aspects:</p> <ol style="list-style-type: none"> 1. Understanding ICT in education 2. Curricula and assessment 3. Pedagogy 4. Application of digital skills 5. Organisation and administration 6. Professional learning <p>Levels of competency development</p> <ol style="list-style-type: none"> 1. Technology literacy 2. Knowledge deepening 3. Knowledge creation 	<p>This third version of the ICT CFT emphasises that teachers must be able to use ICT to help students become collaborative, problem-solving, creative learners and innovative and engaged members of society.</p> <p>UNESCO also provides a <u>Hub</u> with collections of OER aligned with the Framework and mechanisms for teachers to connect with each other.</p>



Framework	Digital competencies	Comments
<p><u>Promoting quality in TVET using technology (UNESCO-UNEVOC, 2020)</u></p>	<p>Levels</p> <ol style="list-style-type: none"> 1. Emerging 2. Applying 3. Infusing 4. Transforming 	
<p><u>Technological Pedagogical Content Knowledge (TPACK)</u></p> <p>For pre-service schoolteachers.</p> <p>Designed to identify the “nature of knowledge” required by teachers to integrate technology into teaching.</p>	<ul style="list-style-type: none"> • Technological knowledge (TK) • Content knowledge (CK) • Pedagogical knowledge (PK) • Pedagogical content knowledge (PCK) • Technological content knowledge (TCK) • Technological pedagogical knowledge (TPK) • Technological pedagogical content knowledge (TPACK) 	<p>Very complex but useful in integrating content, pedagogy and technology specific to different industry disciplines. TPK describes relationships between digital tools, and specific teaching pedagogical practices, PCK describes the same between pedagogical practices and learning objectives; finally, technological content knowledge (TCK) between technologies and learning objectives. TPACK considers the relationships between all three areas.</p>



Framework	Digital competencies	Comments
<p><u>Agricultural Workforce Digital Capability Framework</u></p> <p>For agricultural workers in Australia with a strong focus on new AI technologies and data analysis.</p>	<p>Digital capabilities</p> <ul style="list-style-type: none"> • Digital literacy • Technology operation • Data management • Data monitoring analyse and interpretation • Digital communication • Incidents management <p>Enabling capabilities</p> <ul style="list-style-type: none"> • Process improvement • Personal learning and mastery • Collaboration • Business transformations • Critical thinking <p>Levels</p> <ol style="list-style-type: none"> 1. Novice 2. Competent 3. Proficient 4. Expert 	<p>This framework is added to show that TVET teachers in this industry discipline would need to align with this capability framework.</p>

Framework	Digital competencies	Comments
<p data-bbox="155 268 334 380">Rwanda ICT Essentials for Teachers</p> <p data-bbox="155 390 375 617">Target Audience Based on the UNESCO ICT-CFT but aimed at teachers in schools.</p>	<ul data-bbox="402 268 1230 1877" style="list-style-type: none"> • Study effectively using a blended learning methodology that links face-to-face sessions with online access to content and activities using an LMS. • Explain basic ICT concepts, use and demonstrate the use of hardware. • Demonstrate ability to perform basic maintenance and repair on hardware and assist in software troubleshooting. • Describe the functions and purposes of the Internet in the classroom and demonstrate the capacity of using the Internet. • Use and demonstrate the use of software applications, particularly a word processor. • Use in the administration of the classroom and school spreadsheet in school management. • Describe the functions and purposes of Internet in the classroom and demonstrate the capability of using the Internet, including e-mail and social media functions, in classwork. • Explain basic ICT concepts, use, and demonstrate the use of graphic software. • Explain how existing and planned national policies impact on classroom practices and how their classroom practices correspond to and support policies related to ICT. • Explain the importance of ICT tools to support students' acquisition of school subject matter knowledge and use presentation software and digital resources to support instruction and problem-solving in the classroom. • Manage student project-based learning activities in a technology-enhanced environment to support collaboration, communication and critical thinking. • Demonstrate how various ICT tools can be used to improve assessment. • Organise ICT to suit learning needs in either a computer lab or classroom setting. • Locate necessary resources that help to acquire additional subject matter and pedagogical knowledge for professional development. 	<p data-bbox="1268 268 1468 667">An example of how an African country is implementing the UNESCO framework. However, the competencies are more detailed.</p>

Framework	Digital competencies	Comments
<p>Australian Workforce Digital Skills Framework Target Audience For Australian workers, including VET teachers</p>	<p>Levels of digital skills</p> <ol style="list-style-type: none"> 1. Literacy: cognitive awareness and understanding of digital tools, ways of working, thinking and living 2. Competency: basic ability to use digital tools; thinking and working to fulfil simple tasks 3. Proficiency: well-developed ability to apply digital tools, work, think and live to fulfil complex tasks 4. Fluency: advanced ability to apply digital tools, work, think and live to fulfil complex tasks with ease and speed 5. Savvy: ability to troubleshoot problems in digital tools, ways of working, thinking and living, and to create innovative work processes and products using digital tools and quickly adapt to the digitisation of the workplace 	<p>A generic digital capability framework for the Australian workforce</p>
<p>Plan, organise and facilitate online learning, TAEDEL405 For VET Teachers in Australia</p>	<p>Elements</p> <ol style="list-style-type: none"> 1. Plan and organise online learning environment for delivery of synchronous and asynchronous learning activities 2. Introduce and establish online learning 3. Facilitate online learning 4. Support online learning 5. Review online learning processes 	<p>A unit of competency from the Australian Training and Assessment Training Package (TAE)</p>

Framework	Digital competencies	Comments
<p><u>British Columbia's Digital Literacy Framework</u> For PK-12 teachers and trainers</p>	<p>Six areas of competency</p> <ol style="list-style-type: none"> 1. Research and information literacy (information, information processing and management) 2. Critical thinking, problem-solving and decision-making 3. Creativity and innovation (advanced skills for creative expression) 4. Digital citizenship (Internet safety, privacy and security, creative credit and copyright, legal and ethical aspects) 5. Communication and collaboration (technology mediated communication and collaboration) 6. Technology operations and concepts (general knowledge and functional skills) 	
<p><u>Common Digital Competence Framework for Teachers (Spain)</u> For teachers and trainers</p>	<p>Five areas of competency</p> <ol style="list-style-type: none"> 1. Information and data literacy 2. Communication and collaboration 3. Digital content creation 4. Safety 5. Problem-solving <p>Three levels</p> <ol style="list-style-type: none"> 1. Foundation Level (A1 and A2) 2. Intermediate Level (B1 and B2) 3. Advanced Level (C1 and C2) 	

4. Digital courses and resources for TVET teachers

- [ICT Essentials for Teachers in Rwanda](#),
- [An e-course on computer basics for teachers](#)
- Training program for Balai Latihan Kerja (BLK) instructors in online/distance learning (Indonesia) (OECD, 2020, p. 41)
- Velocity Academy gamified upskilling platform (Cambodia) (OECD, 2020, p. 43)
- Ideas Cube offline server and digital learning kit (Burundi and Democratic Republic of the Congo) (OECD, 2020, p. 45)
- [Commonwealth Certificate for Teacher ICT Integration \(CCTI\) Course Modules](#)
- The Library of Open Educational Resources provides learning material for more than 820 VET qualifications.
- eOppiva is an online learning platform offering courses free of charge and webinars on artificial intelligence.
- [Microsoft basic digital skills courses](#)
- Digi-Check in Switzerland or SELFIE in EU countries are examples of initial assessment of the strengths and weaknesses of VET institutions in their use of technology (OECD, 2021).
- Ideas Cube offline server and digital learning kit by Bibliothèques Sans Frontières which offers offline TVET teacher/trainer digital and pedagogical skills training (Subrahmanyam, 2022).
- Velocity Academy gamified upskilling platform which combines mobile learning with gamification for TVET teachers to develop digital pedagogical skills.
- Guides for TVET institutions and teachers on online and blended learning
- Australian guidelines for VET: <https://www.dese.gov.au/covid-19/vet>
- Joint Education Trust (JET): <https://www.jet.org.za/research-bootcamp>
- UNESCO-UNEVOC: <https://unevoc.unesco.org/home/COVID-19+disruptions>
- The Open Education Consortium (OEC): <https://www.oecconsortium.org/about-oec/>
- Open Educational Resources (OER): <https://www.oercommons.org/>
- TVET professional networks and communities of practice
- UNESCO-UNEVOC TVET Forum (over 6 000 members from more than 180 countries who meet on an online discussion board)
- CEDEFOP Community of Practice of VET Providers on Technology-Enhanced Environments with a Working Group on technology-enhanced learning (CEDEFOP, 2019).

5. Specialist digital roles in TVET institutions

An indication of the organisational shape required to support blended delivery can be found by looking at the far end of the blended learning continuum – that is, at providers who mostly or solely offer their programmes by distance delivery, such as open universities.

Figure A presents an analysis of the teaching and non-teaching roles before, during and after online distance courses at an Australian university.

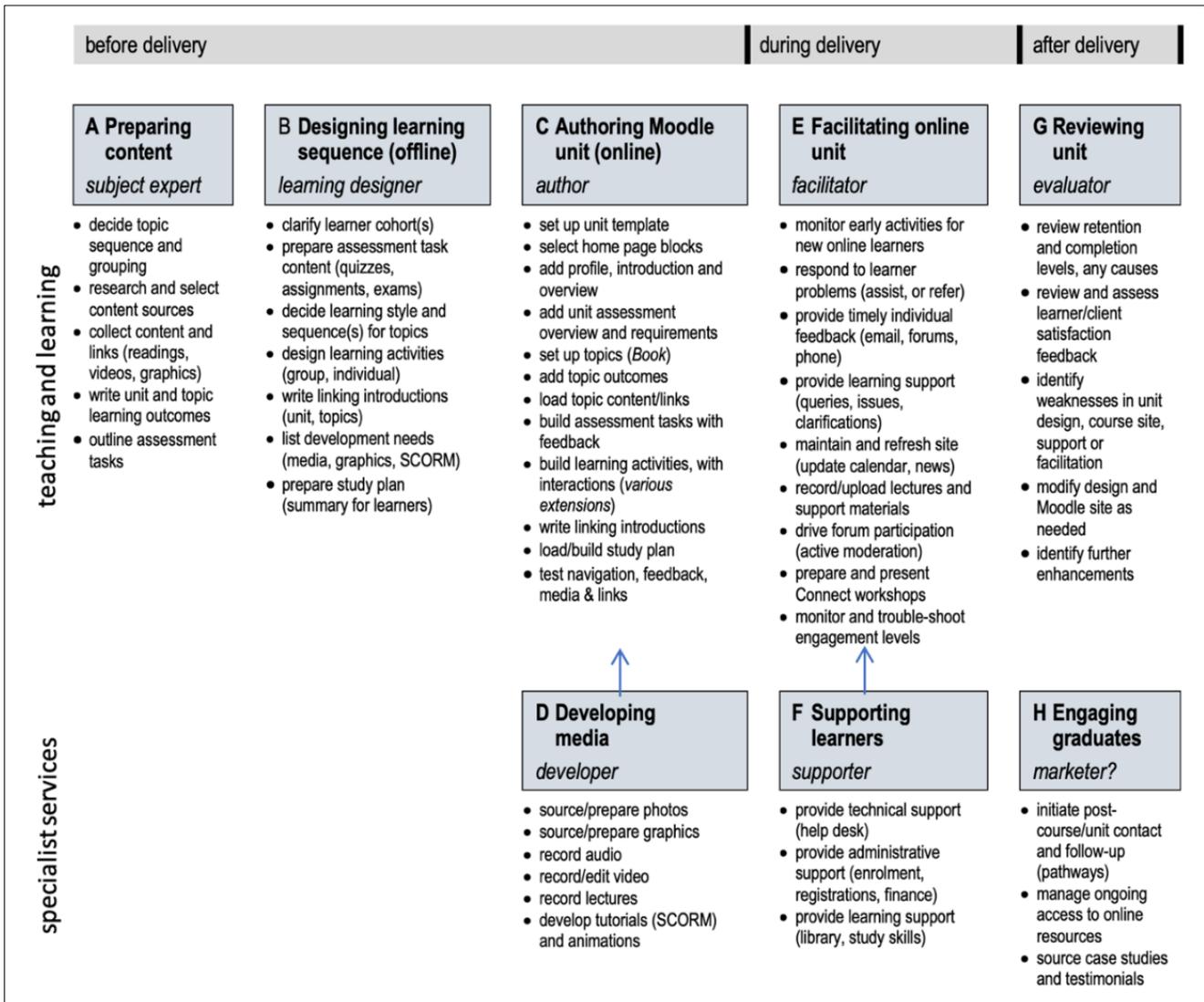


Figure A. Details of specialist digital roles in a distance provider.

Source: Authors

Teachers retain the roles of subject matter expert (A) and teaching (E).

Specialist online educational staff work with them to:

- design learning sequence and activities (B)
- prepare learning materials (C), including media (D)
- build (or “author”) the course in the LMS (also C).

Technical and administrative roles to support online learning include:

- technical support for students (F)
- reviewing and revising the course (G)
- providing post-course support to graduates in the job market (H).



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