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Advancing TVET through industry partnerships and innovation

Discussion paper

Education 2030

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Discussion paper

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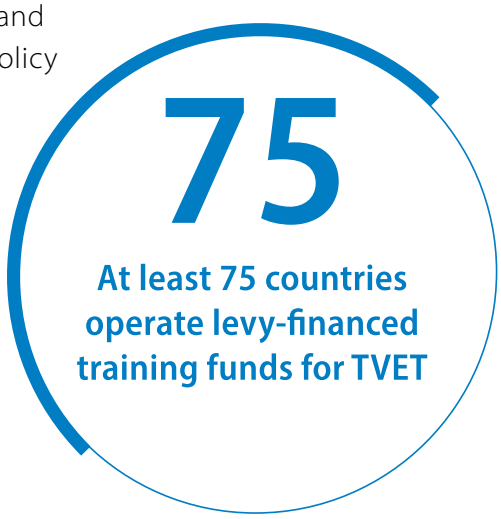
SHORT SUMMARY

Partnerships that make TVET work

What makes an industry partnership capable of delivering lasting change in TVET? Drawing on discussions from the 2026 UNESCO-UNEVOC Bridging Innovation and Learning in TVET (BILT) event, this publication examines what makes industry-TVET partnerships effective and how they can support innovation, strengthen skills systems and improve responsiveness to changing labour market needs.

Through examples from different regions, it presents innovative practices, successful partnership models and lessons from collaboration between industry and TVET institutions. Focus is given to the policies, governance arrangements and financing mechanisms that create enabling conditions for cooperation. The findings show that sustained reform depends not only on effective partnerships but also on reliable investment in skills development. One example is the growing use of levy-financed training funds, which operate in at least 75 countries worldwide. The analysis also examines how approaches such as work-based learning, flexible pathways, digitalization and AI can move beyond pilot projects and become sustainable reforms.

Comparing experiences across countries and regions reveals insights that can inform policy development and programme design. Policymakers, TVET practitioners and training companies can use the practical recommendations offered here to strengthen collaboration, improve governance, and enhance the relevance, quality and impact of TVET systems.



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"Since wars begin in the minds of men and women, it is in the minds of men and women that the defences of peace must be constructed"

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Acronyms

AI	Artificial intelligence
ASEAN	Association of Southeast Asian Nations
AUC	African Union Commission
BILT	Bridging Innovation and Learning in TVET
CANTA	Caribbean Association of National Training Authorities
Cedefop	European Centre for the Development of Vocational Training
CoS	Centres of Specialization
DHET	Department of Higher Education and Training (South Africa)
ETF	European Training Foundation
IAG-TVET	Inter-Agency Group on Technical and Vocational Education and Training
ILO	International Labour Organization
NQF	National qualifications framework
NSFAS	National Student Financial Aid Scheme (South Africa)
OECD	Organisation for Economic Co-operation and Development
PoMiSA	Potential of Microcredentials in Southern Africa
RPL	Recognition of prior learning
SENAI	Serviço Nacional de Aprendizagem Industrial (National Service for Industrial Training, Brazil)
SETA	Sector Education and Training Authority (South Africa)
STEM	Science, technology, engineering and mathematics
TESDA	Technical Education and Skills Development Authority (Philippines)
TGTA	Towards a Global TVET Agenda
TVET	Technical and vocational education and training
UNICEF	United Nations Children's Fund
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNEVOC	UNESCO International Centre for Technical and Vocational Education and Training
WBL	Work-based learning
WEF	World Economic Forum

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The BILT Bridging Event 'Advancing TVET through industry partnerships and innovation', held from 28 to 30 May 2026 in Durban, South Africa, was organized as part of the Bridging Innovation and Learning in TVET (BILT) project. This paper consolidates discussions and insights from the event.

BILT Bridging Events are part of UNESCO-UNEVOC's Innovation and Excellence in TVET project, contributing to the initiative 'Towards a Global TVET Agenda' (TGTA). This multilateral initiative is led by the German Federal Ministry for Education, Family Affairs, Senior Citizens, Women and Youth (BMBFSFJ) and coordinated by the German Federal Institute for Vocational Education and Training (BIBB). It aims to strengthen global collaboration and coordinated action to reposition TVET as a driver of sustainable economic development, social cohesion and inclusive growth.

1. Introduction

This discussion paper was developed through UNESCO-UNEVOC's Bridging Innovation and Learning in TVET (BILT) project, part of its Innovation and Excellence in TVET project and contributing to the initiative Towards a Global TVET Agenda (TGTA). Led by the German Federal Ministry for Education, Family Affairs, Senior Citizens, Women and Youth (BMBFSFJ) and coordinated by the German Federal Institute for Vocational Education and Training (BIBB), TGTA seeks to strengthen global collaboration and coordinated action to reposition TVET as a driver of sustainable economic development, social cohesion and inclusive growth. BILT Bridging Events contribute to the initiative by fostering policy dialogue, peer learning and the exchange of innovative practices in TVET within and across regions.

The paper draws on discussions, presentations, case studies and exchanges during the BILT Bridging Event on Industry Partnerships and Innovation, held in Durban, South Africa, in May 2026. Policy-makers, practitioners, researchers, industry representatives and development partners from different regions shared examples spanning advanced manufacturing, digital skills development, artificial intelligence and work-based learning (WBL), and explored how collaboration between industry and TVET institutions can support innovation and improve how skills systems function. The diversity of participants enabled perspectives to be compared across regions, sectors and institutional contexts. Discussions also highlighted the value of international dialogue, knowledge exchange and peer learning as TVET systems navigate interconnected labour markets, technological change, demographic shifts and shared development challenges.

Building on these discussions, a set of questions emerged repeatedly across the keynote presentations, panel discussions and technical exchanges. These provide the organising framework for the discussion that follows:

- How can governments, employers and training providers work together to build skills systems that are better able to respond to economic and technological change?
- What governance arrangements best support innovation and workforce development?
- How can WBL and flexible learning pathways be expanded and strengthened to support transitions into employment, lifelong learning, upskilling and reskilling?
- How should TVET systems respond to advances in digitalization and AI?
- How can these efforts contribute to greater equity, inclusion and sustainable development?

These questions need to be considered against profound economic, technological and social change. Rapid advances in digital technologies, demographic change and evolving patterns of work are reshaping labour markets across regions, creating opportunities for innovation and growth while challenging education systems to adapt without leaving learners behind. The challenge is therefore not simply to anticipate future skills needs, but to ensure that the benefits of change remain accessible to those already at risk of exclusion.

Persistent youth unemployment, skills mismatches, inequality and barriers to education and training reinforce TVET's role in supporting economic participation, social mobility and lifelong learning, while contributing to more resilient economies and inclusive societies (UNESCO, 2022c). These priorities are reflected in the 2030 Agenda for Sustainable Development, particularly SDGs 4 and 8 on quality education and decent work (United Nations General Assembly, 2015), and in UNESCO's Strategy for TVET 2022–2029, which positions TVET as an enabler of successful and just digital and green transitions while emphasising equity, social inclusion and lifelong learning (UNESCO, 2022c).

Similar priorities are evident at regional level, particularly within the Global South. The African Continental TVET Strategy 2025–2034 (African Union Commission [AUC], 2025) positions skills development as central to economic transformation, industrialization, innovation and sustainable development, calling for stronger connections between education and training systems, employers, labour markets and innovation ecosystems. The ASEAN TVET Council similarly prioritises industry engagement, lifelong learning and regional skills mobility (ASEAN TVET Council, 2021), while the Caribbean Association of National Training Authorities (CANTA) promotes qualifications recognition, quality assurance and workforce development to support regional integration and labour mobility (CANTA, n.d.). Despite differences in emphasis, these frameworks point to a common imperative: more responsive and inclusive TVET systems, connected more closely to industry and labour market needs.

Against this backdrop, attention is shifting from recognising the importance of partnerships to understanding how they can be designed, governed and sustained to improve TVET outcomes. Throughout the BILT Bridging Event, partnerships were framed not as an end in themselves, but as a mechanism for aligning training with labour market needs, providing relevant workplace experience and enabling employers to contribute more directly to curriculum development, innovation and future skills development. Partnerships can also advance broader social objectives by expanding opportunities for women, young people and others historically excluded from education, training and employment, making equity an important consideration in their design and implementation (UNESCO, 2022c).

Attention is also shifting towards broader partnership and innovation ecosystems (UNESCO, 2022c; AUC, 2025), bringing together governments, industry, training providers, intermediary organizations, communities and development partners to address shared challenges through coordinated action. As countries navigate digitalization, green transitions and changing labour market demands, effective collaboration across these ecosystems will remain central to building resilient, inclusive and future-ready skills systems.

The Durban BILT Bridging Event formed part of an ongoing series of international dialogues on emerging priorities for TVET, building on discussions initiated during the 2025 Bridging Event in Kuala Lumpur (UNESCO-UNEVOC, 2026b). Drawing together these exchanges with relevant literature and policy perspectives, this paper examines how industry partnerships are shaping TVET development and their implications for more responsive, inclusive and resilient systems. The discussions highlighted promising examples of collaboration alongside persistent challenges in governance, inclusion, capacity and sustainability. A recurring theme was that effective partnerships depend not only on formal structures and agreements, but on sustained collaboration, mutual learning and the ability to translate dialogue into practical action and long-term institutional change. The sections that follow explore these themes and their implications for future TVET policy and practice.

2. Partnership ecosystems for industry-responsive TVET

2.1. From partnerships to ecosystems

Across regions, TVET systems are operating in rapidly changing environments. Employers continue to report difficulties in finding workers with the skills they need, while many young people struggle to secure meaningful employment. Technological change is reshaping occupations at a pace few could have anticipated a decade ago, and the transition to greener economies is creating new demands for skills development. At the same time, persistent challenges relating to inequality, social exclusion and access to opportunity mean that TVET is increasingly expected to contribute to both economic growth and broader social development. As argued in the Introduction, the question is no longer whether partnerships matter, but how they can be organized to support implementation, adaptation and long-term system change.

These realities raise an important question: how can TVET systems become more responsive, adaptive and inclusive in increasingly complex environments? One response has been a move beyond traditional individual partnerships towards broader networks of collaboration. As skills challenges become more complex, it is becoming increasingly clear that isolated initiatives are rarely enough. Addressing workforce needs now requires employers, training providers, governments and other actors to work together in more coordinated ways. The challenge is no longer simply how institutions engage with industry, but how a wider network of actors can respond to increasingly interconnected skills challenges. As technological change accelerates and labour markets become more dynamic, no single stakeholder holds all the expertise, resources or influence required to respond effectively. Rather than simply involving more stakeholders, ecosystem approaches seek to transform how collaboration is organized. In this paper, partnership ecosystems are understood as structured networks of interdependent actors that coordinate knowledge, resources and decision-making to address shared skills challenges. Their value lies not only in expanding participation, but in improving coordination, strengthening trust, aligning incentives and enabling collective responses that individual organizations cannot achieve alone. This understanding draws on the broader skills ecosystem literature, which shifts attention from the supply of training alone towards the relationships between skills development, demand, utilization and the institutional conditions that connect them. Earlier work highlighted the interdependence of actors and the importance of a supportive environment for sustaining high-skill ecosystems (Finegold, 1999). More recent scholarship has extended this perspective by emphasizing relationality, institutional context and the need to account for informality, inequality and community actors, particularly in the Global South (Brown, 2022; Ramsarup et al., 2023). It is also consistent with international policy frameworks that emphasize coordinated action across education, industry, government and intermediary organizations (UNESCO, 2022c; AUC, 2025).

The growing emphasis on partnership ecosystems is reflected in both policy and practice. UNESCO's Strategy for TVET 2022–2029 (UNESCO, 2022c) and the African Continental TVET Strategy 2025–2034 (AUC, 2025) both recognize that increasingly complex skills challenges require stronger connections between education and training systems, employers, governments and wider innovation systems. Underpinning both strategies is the recognition that skills development can no longer be delivered effectively by institutions working in isolation.

Individual institutions, however capable, are increasingly recognizing the limits of addressing rapidly evolving skills needs in isolation. The pace of technological change, combined with growing economic and social pressures, has made collaboration a necessity rather than a choice. Governments can create enabling policies, but they cannot anticipate every workforce need. Training providers need ongoing engagement with employers if programmes are to remain relevant, while employers themselves depend on education and training systems to develop future talent.

The result is a growing recognition that effective skills development depends less on the actions of individual institutions and more on coordinated action across multiple stakeholders. This represents a broader shift in thinking about how TVET systems evolve – from viewing skills development as the responsibility of individual institutions, towards recognizing that responsiveness, innovation and inclusion emerge through coordinated action across wider partnership ecosystems. However, stronger networks alone do not guarantee better outcomes. Successful partnership ecosystems depend on enabling conditions such as trusted relationships, effective monitoring and coordination, shared incentives, institutional capability and sustained leadership. Where these conditions are weak, collaboration can remain fragmented and ecosystem approaches struggle to move beyond individual projects towards lasting system transformation.

Partnership ecosystems do more than simply broaden participation. They provide the practical framework through which ideas can be tested, refined, adopted and scaled across the wider system. While individual institutions can pilot innovative approaches, broader networks of stakeholders are often required to mobilize resources, build legitimacy, generate evidence and support wider adoption. In this sense, ecosystems provide an important bridge between local innovation and system-level transformation. More fundamentally, many of today's skills challenges cut across institutional boundaries, requiring training providers, employers and governments to work together, share knowledge and align their efforts. Ecosystem approaches create opportunities for this kind of collaboration, helping different actors to learn from one another and respond more effectively to shared priorities. Partnership ecosystems serve purposes that extend beyond labour market responsiveness alone (see **Table 1**). While economic outcomes remain important, many of the examples point towards a broader role for TVET in promoting participation, inclusion and social cohesion. By strengthening connections between institutions, employers and communities, partnership ecosystems can help to expand opportunities and contribute to more resilient and cohesive societies. While the ecosystem approach is increasingly reflected in policy frameworks, its implementation varies considerably across countries, shaped by different governance arrangements, institutional capacities and national priorities. The shift from traditional partnership models towards partnership ecosystems is therefore not simply a change in terminology, but a change in how collaboration is organized to support implementation, innovation and system transformation. **Table 1** summarizes this evolution.

TABLE 1: From partnerships to ecosystems

Traditional partnership model	Ecosystem approach
Institution–employer relationship	Multistakeholder collaboration
Project-based engagement	System-level coordination
Short-term interventions	Long-term strategic alignment
Individual placements and projects	Integrated learning and innovation pathways
Institution-centred	Learner-, labour market- and system-centred

Source: Author's synthesis based on UNESCO (2022c), AUC (2025) and discussions during the BILT Bridging Event on Industry Partnerships and Innovation (UNESCO-UNEVOC, 2026a)

2.2 Governance and partnership models

While ecosystem approaches provide a useful way of thinking about industry-responsive TVET, they become meaningful only when supported by effective governance arrangements. Partnerships do not sustain themselves. They require deliberate investment in the structures, relationships and incentives that enable stakeholders to work together over time. Governance frameworks can create opportunities for collaboration, but successful partnerships also depend on leadership, trust and a shared commitment to common goals. Without these conditions, even well-designed partnership mechanisms may struggle to move beyond good intentions to delivering meaningful results.

Partnership ecosystems are operationalized through different forms of industry engagement, reflecting national labour market priorities, institutional arrangements and development contexts. These differences highlight an important point: there is no single model for building effective partnerships between TVET systems and industry. What matters is not the specific structure adopted, but whether it creates meaningful opportunities for collaboration, shared decision-making and responsiveness to changing skills needs. For example, in Bangladesh, Industry–Institute Linkage Committees create formal channels through which employers and training providers can collaborate on curriculum development, labour market responsiveness and workplace learning. In Zambia, the recently established Sector Skills Bodies are positioned to provide mechanisms for industry to contribute directly to identifying skills priorities and workforce requirements. In the Caribbean, National Training Authorities and the coordinating role of CANTA support quality assurance, qualifications recognition and labour mobility across countries. These examples illustrate that while partnership ecosystems share common principles, they are implemented through different governance and industry-engagement mechanisms depending on national context (see **Table 2**).

TABLE 2: Different models for industry engagement

Country	Mechanism	Primary Function	Key Success
Bangladesh	Industry–Institute Linkage Committees	Aligning training with industry needs	Institutionalized employer engagement
Zambia	Sector Skills Bodies	Labour market responsiveness and employer participation	Industry-led skills prioritization
Caribbean	National Training Authorities and CANTA	Quality assurance and regional coordination	Regional coordination and mobility
South Africa	Centres of Specialization	Coordinating industry-led occupational training	Co-design and workplace learning

Source: Authors

South Africa's approach combines occupational qualifications with sector intermediary structures (such as Sector Education and Training Authorities [SETAs]) and delivery initiatives such as the Centres of Specialization (CoS) programme to strengthen alignment between training provision and workplace requirements. Although the institutional arrangements differ considerably, they point to a common lesson: industry engagement is strongest when it is built into the system rather than left to individual relationships. System mechanisms provide alignment so that labour market information can inform training provision, employers have regular opportunities to contribute and can be involved in curriculum design, and different employers, providers and other social partners can contribute to shared decision-making.

While formal mechanisms provide an important foundation, they are rarely sufficient on their own: effective governance extends beyond structures and procedures, and leadership and trust remain critical to sustaining collaboration over time. Progress is thus often driven by individuals and organizations willing to convene stakeholders, navigate competing interests and maintain momentum. This is where intermediary organizations can play an important role. Sector Skills Bodies, National Training Authorities, CANTA, sector funding bodies, coordination agencies and quality assurance bodies frequently act as brokers within the wider ecosystem, connecting stakeholders, facilitating dialogue and supporting collective action. Their contribution highlights that successful collaboration depends not only on institutional arrangements, but also on organizations that are capable of translating shared ambitions into coordinated action. The emphasis on structured collaboration is consistent with broader work on TVET governance, which increasingly highlights the importance of collective action, stakeholder coordination and intermediary structures in strengthening skills systems (Loveder, 2021; Cedefop, 2025).

The TVET–Industry Roadmap Tool, developed through the UNEVOC Coaction Initiative in 2025 (UNESCO-UNEVOC, 2025), highlighted the importance of moving beyond ad hoc engagement towards more strategic and institutionalized forms of collaboration. Similarly, the stakeholder engagement guidelines underscored the need for deliberate investment in relationship-building, communication and mutual value creation.

Underlying many of the above examples is an important reality: partnerships are not only technical arrangements, but social processes. Governance structures, qualifications systems, engagement mechanisms and planning tools can create conditions for collaboration, but they do not guarantee it. Successful partnerships ultimately depend on trust, relationships, dialogue and a shared commitment to common goals. This suggests that strengthening partnership ecosystems requires attention not only to institutional architecture, but also to the human dimensions of collaboration that enable stakeholders to work together effectively over time.

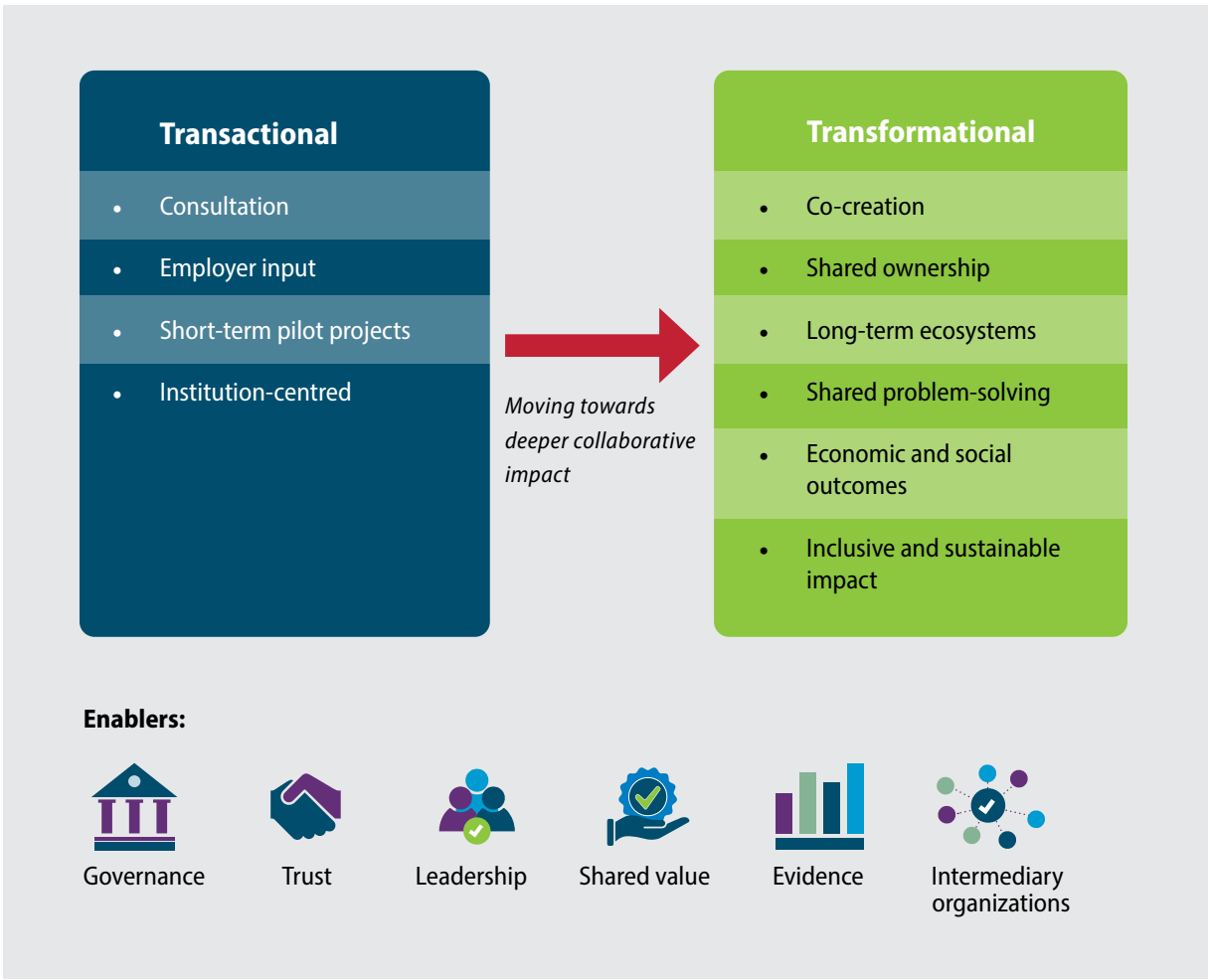
The examples described above point to a changing relationship between industry and TVET providers. Rather than relying on transactional forms of engagement, stronger systems are increasingly characterized by partnerships built on collaboration, shared ownership and mutual value creation (**Figure 1**).

2.3. Partnerships as drivers of innovation and transformation

Partnerships play an important role not only in improving alignment with labour market needs, but also in driving innovation and change. This collaboration is often the catalyst that enables new ideas to be tested, refined and implemented in practice.

Innovation is often linked more closely to collaboration than to policy reform alone. Policy can create enabling conditions, but innovation tends to occur when institutions, employers and other stakeholders work together to address practical challenges and experiment with new approaches. From employer-led partnerships in Ghana, sector-based initiatives in Zambia and industry-engagement mechanisms in Bangladesh, a common pattern emerges: innovation gains traction when stakeholders move beyond policy intent and focus on implementation. Policy can set the direction, but the practical work of testing, refining and implementing new ideas usually happens through partnerships.

FIGURE 1: From transactional to transformational partnerships



Source: Authors

Moreover, the tendency to view innovation primarily as the generation of new ideas should be challenged. Across many TVET systems, innovative concepts, pilot projects and reform strategies already exist. The challenge is often less about generating new ideas than about creating the conditions necessary for them to be embedded, sustained and adopted more widely. In this sense, innovation is as much about execution as it is about design, suggesting that one of the most significant barriers to TVET transformation may be not a shortage of ideas, but the difficulty of moving promising approaches beyond isolated initiatives and into mainstream practice. Innovation therefore becomes less about invention and more about creating the conditions that allow change to take root at scale.

A related theme concerns the importance of demonstrating value – that sustainable partnerships are built not only on shared goals, but also on shared benefits. While policy frameworks can encourage sustained collaboration, long-term engagement often depends on whether stakeholders see tangible returns from their participation. For employers, this may include access to skilled talent, improved productivity, workforce development opportunities or greater capacity for innovation. Small businesses tend to benefit from the capital expenditure already incurred by TVET providers in terms of prototyping, simulation and testing. Viewed in this way, industry engagement becomes less a matter of obligation and more a strategic investment in future skills development.

Vignette 1:

From consultation to co-creation

One of the most significant developments in industry engagement has been the move from consultation to co-creation. Employers are increasingly involved not only in advising training providers, but also in shaping curricula, supporting workplace learning, introducing new technologies and contributing to programme delivery. This can be seen in initiatives presented at the BILT event, such as the Cummins–Accra Technical Training Centre partnership in Ghana, Shenzhen Polytechnic University's industry collaborations in China and the innovation ecosystem of Brazil's Serviço Nacional de Aprendizagem Industrial (National Service for Industrial Training, SENAI) in Brazil.

Employers are no longer simply being consulted; they are increasingly helping to shape programmes, learning environments and innovation processes. This move from consultation to co-creation reflects a deeper form of partnership that is characterized by shared ownership, joint problem-solving and a stronger connection between learning and the realities of work.

This perspective challenges approaches that assume employer participation can be secured through policy alone, highlighting instead the importance of mutual value and shared incentives. This perspective aligns with international initiatives such as the European Centres of Vocational Excellence, which position partnerships as the foundation of regional skills ecosystems that integrate education providers, employers, research organizations and public authorities to support innovation, economic development and social inclusion (European Commission, n.d.).

The importance of shared value becomes particularly evident when partnerships move beyond consultation and towards co-design and implementation. In these contexts, employers are not simply advisers to the system but active contributors to curriculum design, training and skills development.

The South African CoS initiative (Brey et al., 2025) provides a useful regional illustration. Rather than focusing solely on curriculum reform, the programme seeks to create an integrated ecosystem involving government departments, employers, TVET colleges, quality assurance bodies, SETAs and industry representatives. Employers contribute not only to identifying occupational priorities, but also to workplace learning, programme design and implementation. The initiative therefore reflects a shift from consultation towards co-design and shared ownership.

The CoS experience also illustrates the complexity of system transformation. Successful pilots do not automatically translate into system-wide change, and questions of sustainability, capacity, coordination and scaling remain persistent challenges across many TVET reform efforts. The experience highlights a challenge that extends well beyond South Africa. Demonstrating what works is only one part of the transformation process; scaling and sustaining innovation often depends on the strength of the wider ecosystem and its ability to mobilize resources, build ownership and coordinate action over time.

3. Work-based learning as a systemic strategy

The importance of building industry partnerships for the advancement of TVET cannot be overemphasized, and the ecosystem approach points to the need for such partnerships to be integrated into TVET systems rather than individual TVET institutions doing it alone. Within the framework of TVET–industry partnerships, WBL is only one aspect, but it is a critical point of engagement. More fundamentally, discussions during the BILT Bridging Event suggested that WBL should be viewed not simply as a pedagogical approach, but as one of the primary mechanisms through which industry partnerships become operational. While partnerships establish relationships between actors, WBL is often where these partnerships translate into curriculum renewal, workplace learning, institutional capability and stronger labour market responsiveness. There are several motivations for TVET institutions to initiate industry partnerships, including student development, lecturer/staff development and programme/institutional development (Engel-Hills et al., 2023). WBL can be both student- and lecturer-facing, given the dual role of TVET lecturers as teachers and industry experts (Golkwi et al., 2026; van der Bijl and Taylor, 2018). Whereas WBL for students is understood to be part of the requirements for completing a TVET qualification with relevant and industry-aligned skills, WBL is also important for TVET lecturers, ensuring that they develop expertise in teaching their subjects and preparing students for the demands of the workplace. The following paragraphs give a brief description of what is meant by WBL before considering how it benefits student development on the one hand, and the staff and institution on the other.

The Inter-Agency Group on Technical and Vocational Education and Training (IAG-TVET) sees WBL as 'all forms of learning that take place in a real work environment. It provides individuals with the skills needed to successfully obtain and keep jobs and progress in their professional development' (IAG-TVET, 2022, p. 7). The European Training Foundation (ETF) says the following about WBL: 'Work-based learning refers to learning that occurs when people do real work. This work can be paid or unpaid, but it must be real work that leads to the production of real goods and services' (ETF, 2018, p. 5). Both of these definitions speak to the nature of WBL as real work in real work environments, which is key to ensuring that students acquire appropriate skills for the world of work. There is also an emphasis on the concept of situated learning, which refers to learning that takes place in the context in which it is applied (Haruna and bin Kamin, 2019). The definitions also speak to the concept of employability – the ability of an individual to find, maintain and grow within their job. As we explore below, the concept of growing within one's job can be relevant for both graduates and lecturers.

For individuals, WBL can facilitate TVET-to-work transitions and is seen as a bridge between the worlds of learning and work, providing young people with relevant skills that meet the needs of industry (International Labour Organization [ILO], 2022). To successfully implement the WBL methodology, poor-quality instruction relating to lecturers' limited exposure to industry must be addressed as part of their continuing professional development. At the institutional level, closer ties with industry through WBL can improve not only the learning experience for students, but also the teaching experience for lecturers and the confidence of industry in TVET institutions. When lecturers spend time in industry, they come to understand the value of WBL and how it can best be structured for the benefit of their students (van der Bijl and Taylor, 2018). For the aims of WBL highlighted above to be fully realized, policy must be the main driver, and the ecosystem can expand and scale accordingly (IAG-TVET, 2017).

3.1. Expanding work-based learning

The expansion of WBL is guided at a macro level through international and regional strategies that filter down to national policy directives and institutional practice. A key milestone in this global push was the establishment in 2015 of the Inter-Agency Working Group on Work-based Learning,

a subgroup of the IAG-TVET (IAG-TVET, 2022, p. 2). This group coordinates global advocacy and joint tools across major international bodies, including the European Centre for the Development of Vocational Training (Cedefop), the European Commission, ETF, ILO, the Organisation for Economic Co-operation and Development (OECD) and UNESCO. In addition, the UNESCO TVET Strategy (UNESCO, 2022c) has made WBL one of its priorities.

At the African level, the African Continental TVET Strategy encourages member states to engage in industry partnerships (AUC, 2025). The clear signal here is that while WBL is important for improving the employability of TVET graduates, it has a far bigger role to play in advancing TVET. To truly advance TVET, a move must be made from individual institution–industry partnerships to a more systemic reform agenda in which macro-level TVET strategies are coordinated regionally to feed into national implementation, with lessons learned feeding back to the macro level.

Yet even with macro-level policy and alignment in place, the challenge is always in having clear links all the way down to the micro-level, a disconnect that must be overcome for the wider agenda of TVET reform to be achieved. This requires funding strategies at the national level and incentives to gain local employers' buy-in to participate fully in the system because they see benefits for themselves and the broader society of which they are part. Besides funding and incentives, one of the motivators for industry engagement can be through collaboration on specialized campus production units or joint labs where industry challenges are solved collectively by students and industry experts, and this can be done through Centres of Specialization/Excellence. National governments are best placed to drive this agenda, with support from international organizations such as ILO and UNESCO.

These examples highlight an important systems lesson that emerged from the conference. Expanding WBL is not simply a matter of increasing workplace placements. Sustainable expansion depends on employer engagement and institutional capability, policy and governance as well as financing, reinforcing one another. Weaknesses in any one of these dimensions can limit the effectiveness of the wider system, regardless of the quality of individual WBL initiatives.

Vignette 2:

Policy as a driver for effective WBL in Malaysia

Malaysia's TVET system suffers from similar challenges to those found in other systems around the world, such as poor perception, low-quality graduate skills and skills mismatches. The government of Malaysia has struggled to position TVET as the pathway of choice for students coming out of the general education system. This is not helped by the fact that TVET graduates earn modest salaries in the labour market (Rohanai et al., 2025). Another challenge is that TVET is not producing enough skilled people for the Malaysian labour market. The government has implemented interventions to deal with these challenges by introducing WBL as a way to foster collaboration with industry, but also to improve the learning outcomes of graduates.

The Malaysian Qualifications Agency developed a document called Guidelines to good practices: work-based learning, intended to assist higher education providers to bridge the gap between theory in the classroom and the real world of industry. TVET institutions have been implementing WBL to fulfil the objectives of the Malaysian Education Development Plan 2013–2025. Having a national mandate and guidelines can bolster the push for implementation of WBL and provide a framework for evaluating its impact.

3.2. Scaling WBL through partnerships and networks

As economic sectors in low- and middle-income countries modernize and adopt increasingly complex technologies, basic on-the-job training often falls short of meeting new technical skill requirements, making structured WBL vital for bridging this capability gap. Methods of mobilizing resources in support of WBL include instituting levy-grant systems such as those in Kenya, Malaysia and South Africa (UNESCO, 2022a), competency or occupational standards-based systems, and applying recognition of prior learning (RPL) frameworks to integrate informal apprenticeships. In resource-restricted contexts, networks and partnerships are critical to scaling WBL strategies.

Three mutually reinforcing models demonstrate the ways in which partnerships can transition WBL pilots towards scale:

Through institutional capacity and advocacy: Scaling WBL requires local expertise and system-wide advocacy. The ILO, through its African WBL network, is addressing this challenge by creating a network of master trainers who are adaptable to work in different contexts using toolkits that are contextually relevant. The approach addresses two critical barriers simultaneously, by building the local institutional capacity required to run labour market responsive programmes and by creating a cadre of informed advocates who can drive stakeholder buy-in across industry and government.

Through governance and systemic integration: Between 2019 and 2021, Lebanon successfully implemented WBL pilot projects in its agricultural and construction sectors through a coalition of non-governmental organizations, ILO, the United Nations Children's Fund (UNICEF) and the United Nations Food and Agriculture Organization (FAO). These pilots yielded an implementation manual for practitioners across Lebanon and Arab countries, but they highlight a more universal policy challenge: how to plug successful isolated pilots into the broader national TVET architecture. Transitioning from pilot to system-side scale is fundamentally a challenge of governance. This requires formal coordination mechanisms built on trust, shared funding and mutual accountability between national governments and industry.

Through regional financing and co-learning: Countries face resource constraints that can inhibit progress, and cross-border coordination can unlock scale. Nigeria participates in an Economic Community of West African States regional model and a tripartite agreement with Kenya and Zambia. These models demonstrate two benefits:

- Shared governance and finance: the regional framework pools funds for macro-level TVET activities and reduces risk.
- A tripartite structure facilitates co-learning and peer-to-peer benchmarking, allowing member states to optimize their national systems through shared best practices rather than navigating systemic reform in isolation.

Across these examples, effective scaling depends not only on replicating proven pilot initiatives, but also on embedding them within strong institutions, robust financing mechanisms and adaptive partnerships. This highlights a central insight from the conference: achieving lasting reform requires pairing the expansion of successful models with the long-term implementation capability to sustain them.

3.3. Institutional implementation challenges

The return on investment in WBL is heavily contingent on a system's capacity to navigate complex operational hurdles. When implementation does not achieve its desired outcomes, it can be due to the disconnect between macro-level policy intentions and ground-level contextual realities. The challenges fall within two broad categories: operational implementation and structural marginalization.

Operational implementation

The practical execution of WBL is often impeded by bureaucratic approval processes, high training costs and a lack of institutional readiness. As Samara (2025) notes, WBL efficacy is highly sensitive to the internal school environment, institutional leadership, financial resource allocation and localized labour market dynamics. Without alignment across these factors, WBL programmes risk yielding negative student perceptions and poor employment outcomes.

While ad hoc execution offers immediate flexibility, establishing standardized operational toolkits and streamlined, decentralized approval processes creates the systemic capacity required for predictable, timely implementation. Policy frameworks should incentivize institutional leadership through performance-linked grants, enabling TVET institutions to align their internal environments with local market demands.

Often confronted with a shortage of industry placements, innovative institutions develop workarounds, but still in isolation. For example, Vhembe TVET College in South Africa has successfully dealt with such constraints by implementing a rotational student placement model and funding long-distance transportation to place students in mining and industrial hubs in different provinces. These types of actions are commendable, but highlight systemic vulnerability, with institutions using internal resources to solve systemic problems.

There needs to be a transition from institutional silos to an ecosystem partnership model. This can be done by establishing regional TVET–industrial intermediaries who can carry the burden of searching for, securing and financing long-distance placements, to create a shared governance framework and pooling of interprovincial resources.

Structural marginalization

A broad range of dimensions come under structural marginalization, including gender, geography, race, disability and socio-economic background. Here we focus on the gender dimension, not because it is more pertinent than the others, but because it was highlighted in the study visits to local TVET colleges that formed part of the conference. Gender imbalances in TVET remain persistent, but manifest unevenly across TVET systems. In some contexts, aggressive policy interventions have dramatically shifted enrolment. In South Africa, women comprise 61.5% of enrolments in occupational qualifications, though men still represent the majority in shorter skills programmes at 62.6% (DHET, 2025). Conversely, in Côte d'Ivoire, structural separation remains embedded. Female participation in industrial TVET sectors sits at just 18.1%, with women heavily clustered in hospitality and commerce, while men fill up to 91% of construction and automotive tracks (Machado and Muller, 2025).

Policy metrics must recognize that simply shifting numeric parity in enrolment fields does not automatically equate to achieving operational workplace equity, systemic safe environments or long-term industry retention for female practitioners. Possible responses could include gender-responsive career pipelines and, where appropriate, measures to promote greater gender parity. These could be supported through targeted bursaries or scholarships and communication initiatives aimed at challenging gender stereotyping in industrial fields such as construction and automotive. This gender dimension is explored further in **Vignette 3**.

The examples in this chapter indicate that effective scaling of WBL depends not only on expanding individual workplace placement, but also on integrating programmes within broader partnership ecosystems. The conference examples from Germany, Nigeria, South Africa and Malaysia illustrate how countries are making progress by treating WBL as part of a wider strategy for governance, industry engagement, quality improvement and system transformation rather than as a stand-alone programme. While their approaches differ, each demonstrates how partnerships extend beyond formal agreements to shape curriculum, strengthen institutional capacity and improve labour market responsiveness. This shifts attention from the quantity of placements towards the quality of partnerships and the institutional conditions that enable WBL to flourish.

Vignette 3:

Gender parity in South Africa – moving from access to labour market absorption

Systemic expansion and financial inclusivity

South Africa's White Paper on Post-School Education and Training set an ambitious target to expand TVET enrolment to 2.5 million by 2030. TVET enrolment expanded substantially over the following decade, increasing from 358,393 in 2010 to 673,490 in 2019, with the primary driver of gender parity being targeted financial intervention. Targeted financial support through the DHET Bursary Scheme, administered by the National Student Financial Aid Scheme (NSFAS), has helped to reduce financial barriers through tuition support and allowances for eligible students from poor and working-class backgrounds.

By 2018, female students constituted 61.4% of all NSFAS beneficiaries (NSFAS, 2019). This financial support mirrored wider trends across the post-school education and training sector, where female enrolment had reached 62.7% by 2023. At the institutional level, this shift in access is clearly visible: campuses such as Thekwini TVET College (Springfield) report high female participation in engineering workshops traditionally dominated by men. Overall, DHET (2025) data indicate that female enrolment in occupational qualifications reached 61.5% (compared with 38.5% for males), though short skills programmes remain skewed towards males (62.6% vs 37.4% females).

Constitutional mandates vs programmatic gaps

While broad policy interventions have expanded access, gender-specific targeting remains uneven. As UNESCO-UNEVOC (2020a) highlighted, key national TVET frameworks such as the National Certificate Vocational programmes in science, technology, engineering and mathematics (STEM) fields often lack explicit gender-parity directives. However, the sector leverages a strong constitutional baseline. Under Chapter 9 of the South African Constitution, the independent Commission for Gender Equality actively audits TVET college councils to align their admissions and management policies with national and international equity conventions. The DHET policy framework for Student Admissions directly mandates college councils to operationalize the values of access, equity and redress during recruitment.

The 'leaky pipeline': the transition from qualification to work

Despite significant gains in female enrolment and funding in STEM fields, a critical point of policy friction remains at the transition into the labour market. High levels of enrolment have not automatically yielded equal employment outcomes or throughput (Friderichs et al., 2024).

Key policy takeaway

Financial subsidies and admission mandates can successfully equalize classroom access. However, achieving true systemic parity requires end-to-end policy integration, connecting TVET access to structured WBL placements, gender-sensitive workplace transitions and active employer compliance measures to prevent post-graduation drop-off.

4. Digital innovation and flexible learning pathways

Digital transformation is a high priority for education systems around the world. TVET systems are grappling with this in unique ways, given their position as the bridge between formal education and employment. Through its UNEVOC platform and BILT events, UNESCO continues to drive the global dialogue on digital transformation in TVET. The BILT Bridging Event held in Malaysia in 2025 honed in on policies for digital transformation and AI integration, and this section builds on that theme.

At a global level, UNESCO has been driving the move towards innovative TVET practices. In 2020, the organization developed an innovation framework aimed at a variety of TVET providers, including schools offering TVET, technical and vocational training institutes and colleges, and enterprise-based training providers. The framework was a key output of the Skills for Innovation Hubs (i-hubs) project, a global initiative implemented between 2018 and 2020 by the UNESCO-UNEVOC International Centre for TVET. The framework consists of an Innovation Toolbox that is meant to offer tools for TVET institutions to enable them to self-assess their performance and potential for innovation (UNESCO-UNEVOC, 2020b). The existence of a global framework for innovation readiness for TVET provides a standardized and evidence-based approach to aligning training with rapidly changing labour markets.

4.1. Digital innovation ecosystems in TVET

To remain resilient amid rapid technological disruption, modern TVET systems are shifting away from rigid, isolated training structures towards dynamic digital innovation ecosystems. Cultivating these ecosystems requires a clear understanding of what this entails in an educational context. An ecosystem approach (see Section 2.1) requires stakeholders to look beyond individual institutional inputs and instead guide the complex, interconnected dynamics of the entire system. For instance, according to the OECD (2026), applying an ecosystem lens to curriculum reform means optimizing quality design principles while simultaneously navigating and aligning the varied, shifting priorities of industry, government and students.

To scale the impact of these educational environments, policy-makers can look to the World Economic Forum's *Innovation ecosystems: A toolkit of principles and best practice* (WEF, 2025). WEF outlines eight guiding principles designed to evaluate and strengthen modern ecosystems: collaborative, sustainable, resilient, human-centric, efficient, transparent, accessible and scalable. While emerging TVET digital ecosystems rarely manifest all principles simultaneously, these metrics serve as an operational compass rather than a rigid prescription. They provide clear direction for achieving measurable, system-wide transformation.

Across the regions, leading TVET institutions are already operationalizing these ecosystem principles. In Asia, Universiti Tun Hussein Onn Malaysia and Shenzhen Polytechnic University in China are pioneering tech-driven models that bridge the gap between higher education and advanced industrial digital architecture. The Shenzhen Polytechnic University model in particular features deep, structured partnerships with industry and integration of real work environments into learning. In Africa, the Swiss–South African Cooperation Initiative fosters public–private collaboration to deliver accessible, locally tailored industry placements that integrate digital skills training. For South America, SENAI in Brazil demonstrates ecosystem resilience by rapidly scaling digital training solutions to align with industrial modernization. This is a collaborative ecosystem where technology-based start-ups act as research, development and innovation partners for SENAI schools, creating a link between the practical needs of industrial training and the agility of educational technologies.

4.2. AI and the future of TVET systems

While digital ecosystems potentially hold the key to the future of TVET systems, one of their components that has far-reaching transformative implications is AI. AI is seen as a positive addition to the TVET sector, with envisaged benefits such as offering virtual laboratories where physical resources are lacking, especially in low-resource areas (Golkwi et al., 2026). The impact of physical AI is likely to extend deeply into occupations traditionally associated with TVET. But digital transformation in TVET goes beyond technology, and AI is ultimately meant to serve people; it must thus be human-centric and improve the quality of life for all community members. As with WBL, AI adoption and integration into TVET systems will require an ecosystem approach in which international policy and regional strategies guide national implementation and institutional practice. The key elements for AI to be transformative for TVET institutions will lie in macro-level and institutional policies, supportive governance structures and coordination with industry.

Globally, policies and frameworks are being developed to guide a stakeholder approach to the responsible use of AI. UNESCO has developed AI competency frameworks, one for teachers and another for students (UNESCO, 2024a, 2024b). These frameworks are meant to guide the development of national AI competency frameworks. In Europe, the EU AI Act serves as a regional reference for how to approach the use of AI in organizations. These international and regional frameworks need to be translated into national TVET policies and institutional practice, supported by governance structures that guide the responsible and ethical use of AI. Research conducted on the impact of integrating AI into TVET institutions showed that while students and learners were aware of AI, it was not used in teaching and learning, as the conditions were not enabling (Golkwi et al., 2026). Institutions thus need to drive integration, guided by sound policies that govern its use. Moreover, ultimately, all efforts towards integration have to be done with the participation of industry and other social partners such as universities and government. At institutional level, Omnia in Finland illustrates how wider digital-transformation principles can be operationalized within TVET. Omnia Education Partnerships supports digital skills development, educator capacity-building and technology-enhanced learning, including extended reality (XR)-based training solutions for TVET providers (Omnia Education Partnerships, n.d.).

4.3. Flexible qualification frameworks and microcredentials

Globally, microcredentials have emerged as a critical focal point for labour market agility and education reform (UNESCO, 2022b). As the landscape is rapidly expanding, clear definitions are vital to protect the integrity of education. UNESCO (2022b, p. 6) defines a microcredential as 'a record of focused learning achievement verifying what the learner knows, understands or can do' that 'includes assessment based on clearly defined standards and is awarded by a trusted provider'.

As education systems are transformed by technology, especially the rapid development of AI, learning pathways require levels of flexibility never seen before. Innovative ways of approaching teaching and learning become imperative for TVET systems to remain relevant into the future. The concept of lifelong learning, aided by the modularization of courses for both initial learning and the re- and upskilling of employees, characterizes discussions of this nature. Flexible qualification frameworks and/or microcredentials afford opportunities for TVET institutions to innovate and keep pace with developments in the labour market and industry.

At system level, Finland's Digivisio 2030 initiative provides an example of how shared digital infrastructure can support more flexible and continuous learning. Bringing together Finnish higher education institutions, the initiative is developing a common digital service environment intended to make learning opportunities easier to access across institutional boundaries and throughout the life course (Nordlund and Piiroinen, 2022; Digivisio 2030, n.d.).

The architecture of flexible learning pathways varies considerably by country, but their systemic reach and impact depend on macro-level backing. South Africa provides a mature example of an integrated national qualifications framework (NQF) designed to support flexibility. In the Philippines, the Philippine Qualifications Framework and the Technical Education and Skills Development

Vignette 4:

Microcredentials in Southern Africa

The Potential of Microcredentials in Southern Africa (PoMiSA) project, financed by the European Union, is a pivotal initiative to strengthen higher education and workforce development across the Southern African region. It is a collaborative effort among leading African and European universities, national councils and strategic partners to explore and leverage the transformative potential of microcredentials. The project's core objective is to develop higher education capacity through microcredential policy development in Southern African countries.

PoMiSA aims to contribute to the advancement of higher education (including TVET) and workforce development in Southern Africa by unlocking the potential of microcredentials. Through collaborative efforts and strategic initiatives, the project seeks to establish a robust framework for the recognition, quality assurance and regulation of microcredentials, ultimately fostering innovation, mobility and economic growth in the region. PoMiSA focuses on creating targeted and flexible learning pathways that effectively tackle the skills gaps in the region. As industries rapidly evolve in response to technological advancements and changing economic demands, traditional education systems frequently find it challenging to keep up. Microcredentials present a viable solution by enabling learners to acquire specific skills and competencies that are immediately applicable in the job market through standardized credit-transfer frameworks and/or stackable digital badges. This approach not only enhances employability, but also promotes lifelong learning, empowering individuals to navigate new challenges and seize emerging opportunities throughout their careers.

Authority (TESDA) guidelines are geared towards strengthening modular and stackable credentials in the TVET space through the TESDA online platform.

For policy-makers, this framework underscores that short-form digital badges or unvetted credentials do not constitute formal microcredentials unless rigorously backed by transparent national standards and trusted institutional quality assurance.

4.4. Risks, tensions and implementation challenges

Whenever innovation is introduced in an education system, much is unknown about factors that influence whether implementation will have the desired impact and/or about the pitfalls that lie ahead. One of the big challenges for implementing AI in TVET systems, especially in low- and middle-income countries, is having to overcome the problems of chronic underfunding of TVET and the infrastructural deficits that persist. The adoption of AI requires reliable high-speed internet connectivity, consistent electricity supply and sufficient computing power, including the maintenance of such infrastructure, which are concerns in the Nigerian TVET system (Golkwi et al., 2026).

The introduction of technology and innovation in TVET systems has to take account of ethical issues relating to responsible use. These ethical issues are especially challenging when AI is introduced into the system, as policy to regulate new technologies often lags behind the development of said technology; institutions thus need to tread carefully in the absence of national policy that guides implementation.

Moreover, policy actors should not work in isolation and need to leverage international frameworks to guide relevant policy formulation. As interest in microcredentials grows, the lack of institutionalized frameworks for their governance is an ongoing challenge that countries should work together to resolve. Regional coordination mechanisms such as PoMiSA provide a model that others can learn from, showing how pooled resources can address funding constraints and create an environment in which shared learning generates synergy for systemic impact. Figure 2 expands on the specific risks that are associated with AI integration.

FIGURE 2: Risks and challenges facing AI integration in TVET institutions in Europe

Source: Delia (2025)

5. System-level implications for future-ready TVET

This section focuses on the system-level requirements that enable and support TVET programmes to establish partnerships and to be innovative. Five specific interrelated system-level requirements are discussed by drawing on recent literature and the deliberations of the BILT event held in South Africa in May 2026: governance and coordination; financing and sustainability; quality assurance and standards; capacity development; and knowledge sharing, peer learning and international collaboration.

5.1. What is future-ready TVET?

As a precursor to the five specific interrelated system-level requirements highlighted above, it is important to reflect on what is meant by 'future-ready TVET'. According to UNESCO-UNEVOC (2026b), technology must complement, not replace, the human element in education, while TVET systems must adopt a critical and evidence-based mindset towards educational technology. There is also a need to prioritize the capacity-building of TVET teachers and institutional leaders. In a related publication, a conceptual framework for digital transformation of TVET in developing countries argued for a focus on 'digital infrastructure that can support digital transformation in TVET at a level and pace appropriate to the country' (UNESCO, 2023, p. 11), while placing equality and inclusivity at the core of the process. It also supported the emphasis on TVET teachers and institutional leaders through the acquisition of new digital skills. The importance of enabling legislation that leverages digital transformation in TVET (such as data privacy and new skill-recognition systems) is also emphasized. Turning to the ILO and the OECD, similar trends can be observed. The ILO (2026) emphasizes changing skills demands, inclusive growth, forward-looking skills, employability and decent work as part of future-ready TVET. The OECD (2023), in turn, emphasizes the use of digital technologies to innovate TVET design and delivery, as well as the flexibility of learning pathways.

Drawing on the BILT event, it was emphasized that achieving system-wide TVET transformation requires aligning digital transformation, flexible pathways and evidence-based governance across three strategic fronts. Firstly, there is a need for flexible and inclusive systems: the rapid integration of AI and digital tools demands an equally agile qualifications ecosystem. The adoption of microcredentials and RPL mechanisms is vital for accommodating those engaged in training in the informal and non-formal sectors. Secondly, cross-border WBL scaling is required: expanding WBL requires regionally integrated, coordinated approaches and frameworks in a coordinated manner. Building institutional capacity and master trainer networks enables TVET systems to prepare workers for mobility in global and regional economic markets. Thirdly, there is a need for research-driven innovation: systemic scaling relies on bridging the gap between research and practice. To ensure sustainable adoption, TVET systems can consider local research capacity, establishing feedback loops that generate empirical evidence to refine and stabilize pilot innovations with specific national contexts.

5.2. System-level requirements for future-ready TVET

The first system-level requirement that enables and supports TVET programmes to be future-ready is governance and coordination. In this regard, several key observations can be made from literature and the BILT conference proceedings. Sectoral structures for TVET (e.g. skills councils, industry training boards and professional councils), national structures (e.g. skills development agencies and human resource councils) and even regional coordination structures (e.g. the ASEAN TVET initiatives and Cedefop) play a key role in coordinating TVET programmes. In many cases, these structures are not lacking resources but are weak on what the OECD (2023) refers to as a networked governance approach. This approach is a fundamental prerequisite for a future-

ready TVET system to be developed and requires political leadership and system-level prioritization to succeed, particularly at national levels. In this case, successful TVET reform relies on the deliberate domestication of macro strategies such as the African Continental TVET Strategy 2025–2034 (AUC, 2025) and the UNESCO Strategy for TVET 2022–2029 (UNESCO, 2022c). Similar models of structured regional alignment and national implementation are evident in the work of CANTA and the Bangladesh Technical Education Board. If there is one priority that can make or break the modernization of TVET, it is moving (or failing to move) towards a more networked governance model.

Financing and sustainability are also important requirements for TVET reform. As mentioned earlier, care should be taken to procure digital infrastructure that can support digital transformation in TVET at a level and pace appropriate to the country. While digital infrastructure is obviously not the only consideration in developing future-ready TVET systems, the financing of this infrastructure often creates an anomaly in that it is also the most difficult investment to sustain (UNESCO, 2023). The return on investment of apprenticeship systems is a second theme that was identified at the BILT event. Intermediary structures, such as group training organizations championed by networks like the Global Apprenticeship Network, offer a proven mechanism to mitigate employer risk. By absorbing the administrative burden, mitigating long-term employment lock-in and providing dedicated human resource oversight, group training organizations aggregate demand across small, medium and micro enterprises. This enables them to participate in national WBL ecosystems.

The third theme for future-ready TVET is quality assurance and standards. Discussions at the BILT event included maintaining quality, relevance and portability in occupational programmes, WBL systems and digital learning pathways. Microcredentials were singled out as a new phenomenon that is increasingly being discussed globally. The panel from the PoMiSA project explored this theme in more detail. The panel members from South Africa, Mauritius, Estonia, Ireland and Lesotho shared their insights. These included a strong drive through a nationally funded five-year scheme to pilot microcredentials in Ireland; legislative amendments to formally include microcredentials in the Mauritian higher education system; and the adoption of the common European definition and framework for microcredentials in Estonia. Across the board, mention was made of the demand-side origins of microcredentials for many years: 'the labour market argued that we have been long in this game, you just did not recognize us in regulatory frameworks…' (Maggy Beukes-Amiss, Senior Lecturer, University of Namibia). The implementation of new occupational programmes in South Africa, developed in collaboration with industry, was also presented. Flexible qualification frameworks that support flexible learning pathways including both microcredential and new occupational programmes were also discussed.

Future-ready TVET systems also require strengthened human capacity development for partnership management, WBL delivery, digital transformation, AI integration and innovation coordination. Acquisition of new skills by practitioners, managers and policy-makers is required not only to deliver future-ready TVET programmes, but also to work in more coordinated and networked governance models, as discussed earlier (OECD, 2023). This dual technical and organizational demand places pressure on the people who work in TVET systems, often in contexts of resource constraints and existing capacity limitations.

Knowledge-sharing, peer learning and international collaboration is the final theme identified to support future-ready TVET. This cross-cutting theme explored how systems learn from one another, how models travel across contexts and the role of international platforms in accelerating innovation and reform. The importance of regional and international organizations as intermediaries and facilitators of dialogue and the building of collective intelligence, such as through the UNEVOC BILT series, was highlighted. The poster sessions presented at the BILT event in South Africa provided good examples from Ghana (Cummins–Accra Technical Training Centre Partnership), South Africa (German TVET Cooperation Skills for Equity and Transformation), France (national investment in the modernization of TVET) and Malaysia (a digital and green framework to modernize the construction sector).

5.3. Strengthening industry-responsive TVET

One of the clearest lessons is that there is no universal blueprint for the effectiveness of industry-responsive TVET. Experiences from Africa, the Caribbean, Asia and beyond showed that successful approaches are shaped by local realities, institutional arrangements and labour market conditions. What matters is not duplicating a model from elsewhere, but understanding the principles that make partnerships work and adapting them to context. The experiences highlighted in this section point to a different way of thinking about TVET reform. While reform efforts to improve individual institutions, programmes or qualifications remain important, these experiences point towards a more systemic perspective, where progress increasingly depends on the ability of diverse actors to coordinate action, share resources, generate evidence and respond collectively to emerging challenges. In this context, partnerships do more than support implementation. They help TVET systems to learn from experience, adapt to change and respond more effectively over time.

Effective ecosystems depend on more than formal structures. Governance provides an important foundation, but successful collaboration is equally dependent on leadership, trust and relationships. While governments play a central role in setting direction and creating enabling conditions, progress often depends on the willingness of employers, training providers and other partners to work together around shared priorities. In practice, change is frequently driven by individuals and organizations that are able to build consensus, navigate competing interests and maintain momentum over time. Trust becomes particularly important where responsibility, resources and decision-making are distributed across multiple actors.

Another recurring theme from the conference was the importance of mutual value and evidence. Employers are more likely to invest time, expertise and resources when they see clear benefits, whether through workforce development, productivity gains, talent pipelines or opportunities for innovation. Evidence also plays an important role. While often viewed as an outcome of successful initiatives, it can also act as an enabler of change by building credibility, strengthening stakeholder confidence, attracting investment and creating the conditions for successful approaches to be scaled. In this sense, evidence does not simply document progress; it can also help to generate it.

The challenge of scaling remains a central concern. Many countries have promising pilots, innovative programmes and successful partnership models, but moving from isolated examples to broader system change is difficult. Scaling requires coordination, resources, institutional capacity and sustained commitment. It also requires openness about what has worked, what has not and what needs to change.

Vignette 5:

Partnerships for inclusion and opportunity

While employability remains an important objective of TVET, some of the most interesting examples demonstrate how partnerships can support wider social outcomes. In Lesotho, RPL helped experienced workers to gain formal recognition for skills they had developed over many years, improving their access to further opportunities. Conference presentations noted that in Paraguay, a self-sustaining school model linked technical training with entrepreneurship and income generation, creating benefits that extended beyond the classroom. In St Kitts and Nevis, partnerships helped to connect training opportunities with community development efforts and pathways for young people entering the labour market.

What these examples have in common is a recognition that TVET is not only about preparing people for jobs. It can also help to strengthen communities, widen participation and create opportunities for individuals who might otherwise remain excluded from education and employment pathways.

6. Recommendations

Drawing on the BILT Bridging Event held in South Africa in May 2026, this discussion paper highlights a number of important themes, each of which is discussed in the preceding sections. These discussions were premised on a set of questions, and each is responded to below in the form of specific recommendations for consideration by TVET actors globally.

Many of the priorities discussed in this paper are already well established in international and regional TVET strategies. What became increasingly clear during the conference, however, was that the sector is not facing a shortage of ideas or policy direction. The more persistent challenge is implementation – turning promising initiatives into lasting system change. Throughout the conference, discussions repeatedly returned to the importance of leadership, institutional capability, partnerships, governance, trust and evidence, not as objectives in their own right, but as the conditions that enable reform to take hold, adapt and grow over time.

This shift in emphasis is perhaps the most important contribution that emerged from the conference. Across countries and regions, there is already considerable convergence around the direction of TVET reform. Partnerships, WBL, digital transformation, flexible learning pathways, inclusion and stronger labour market responsiveness all feature prominently in international, regional and national strategies. The conference therefore raised a different question – not what should change, but what will enable these ambitions to be implemented, sustained and ultimately scaled.

The discussions repeatedly pointed to the same enabling conditions. Successful examples, whether focused on CoS, WBL, AI, governance or innovation, were distinguished less by policy itself than by the conditions that would support implementation. They consistently reflected strong leadership, institutional capability, trusted partnerships, intermediary organizations able to connect actors across the system, and a willingness to learn, adapt and build on evidence over time.

The recommendations that follow should therefore be read as recommendations not simply for action, but for strengthening the enabling environment needed for lasting system change.

How can governments, employers and training providers work together to build skills systems that are better able to respond to economic and technological change?

The conference reaffirmed the importance of networked ecosystem-based partnerships. The challenge for TVET actors lies in operationalizing this broadly agreed approach. Contexts differ significantly, and in many cases limited progress reflects the complexity of implementation rather than a lack of commitment. An important lesson from the BILT event is to invest more in organizations that can act as ecosystem brokers (also referred to as backbone organizations) that are able to connect employers, providers and government while sustaining collaboration beyond individual projects. Effective ecosystems also need to align the priorities of industry, government and training providers. New technology platforms that link across the supply and demand parts of skills systems are important to recognize in this regard (Grech and Farkas, 2026).

- Implications for policy-makers: Plan for ecosystem integration.
- Implications for TVET institutions: Build capacity and leadership.
- Implications for industry and social partners: Support the testing of innovative solutions.

What governance arrangements best support innovation and workforce development?

A critical issue for the modernization of TVET programmes is the extent to which systems move towards more networked governance models. Employers are also encouraged to affiliate with sectoral or cluster structures through which learning can be consolidated and shared. A key emphasis from the BILT event was the need for trust and relationship-building to underpin governance structures.

- Implications for policy-makers: Design policy guardrails for networked governance in TVET.
- Implications for TVET institutions: Modernize TVET programmes by drawing on networked models.
- Implications for industry and social partners: Affiliate with networked structures.

How can WBL and flexible learning pathways be expanded and strengthened to support transitions into employment, lifelong learning, upskilling and reskilling?

Flexible qualification frameworks can support pathways that include microcredentials and new occupational programmes, while enabling more demand-led, digital and widely recognised forms of WBL. Such pathways are most likely to succeed when developed through co-design rather than consultation alone, with employers, providers and policy-makers jointly identifying challenges, testing solutions and sharing responsibility for implementation.

- Implications for policy-makers: Review and modernize NQFs and qualifications systems.
- Implications for TVET institutions: Review and modernize the delivery options for occupational qualifications.
- Implications for industry and social partners: Play an active role in new forms of WBL delivery.

How should TVET systems respond to advances in digitalization and AI?

TVET systems should approach AI as both an opportunity and a governance challenge. Effective integration requires appropriate digital infrastructure and institutional capability, alongside clear guidance on safe, ethical and equitable use. Collaboration with industry can help institutions understand emerging applications and skills needs, while experimentation within agreed guardrails can support learning and adaptation as technologies evolve.

- Implications for policy-makers: Provide guidance on the safe, ethical and equitable use of AI in TVET.
- Implications for TVET institutions: Experiment with AI solutions within a set of agreed guardrails.
- Implications for industry and social partners: Share lessons and insights from industry experiences in using AI.

How can these efforts contribute to greater equity, inclusion and sustainable development?

Industry-responsive TVET should not be viewed solely through an economic lens. While partnerships are important for employability, productivity and labour market responsiveness, they also contribute to broader social objectives. By creating pathways into learning and work, strengthening connections between institutions, employers and communities, and expanding opportunities for participation, TVET can support social cohesion, inclusion and more equitable development.

- Implications for policy-makers: Situate TVET reform within a broader vision of social transformation.
- Implications for TVET institutions: Promote a culture of effectiveness that is balanced with equity and inclusion.
- Implications for industry and social partners: Develop pathways from work to institutions that can interoperate with supply-side opportunities.

7. Conclusion

The 2026 BILT event reaffirmed the importance of partnerships and innovation in advancing TVET systems. At first glance, this may appear familiar and could even lead some to conclude that the event was little more than a 'talking shop'. We would argue otherwise. The value of the conference lay not in introducing a new reform agenda, but in demonstrating, through examples from different countries and regions, that meaningful progress is possible when the conditions for implementation are deliberately strengthened.

Across the discussions, successful initiatives consistently combined technical reforms with strong partnerships, effective governance, institutional capability, trusted relationships and sustained leadership. Collectively, these examples suggest that the next frontier for TVET is less about identifying new priorities and more about creating the conditions that allow existing priorities to take root and flourish.

The examples presented demonstrate that many of the priorities reflected in the UNESCO Strategy for TVET and the African Continental TVET Strategy are already beginning to take shape in different contexts. While these initiatives vary considerably in scale, maturity and context, they provide practical evidence that the ambitions set out in these strategies are achievable. The conference therefore offers grounds for cautious optimism. The challenge now is less about defining the direction of reform than about creating the conditions that enable successful approaches to be adapted, sustained and scaled across diverse national contexts.

Figure 3 summarizes the central message emerging from the conference: **while there is growing consensus on the direction of TVET reform, lasting transformation depends on strengthening the conditions that enable implementation.**

The event took place during a time of transition and increased hype around AI and its implications for TVET. Perhaps the strongest message to emerge from the conference was the continuing importance of human agency. It is people who build trusted partnerships across TVET ecosystems, lead governance reforms that foster collaboration and use AI and other technologies to strengthen, rather than replace, human decision-making. Ultimately, it is this combination of human leadership and technological innovation that will enable more responsive and connected skills systems.

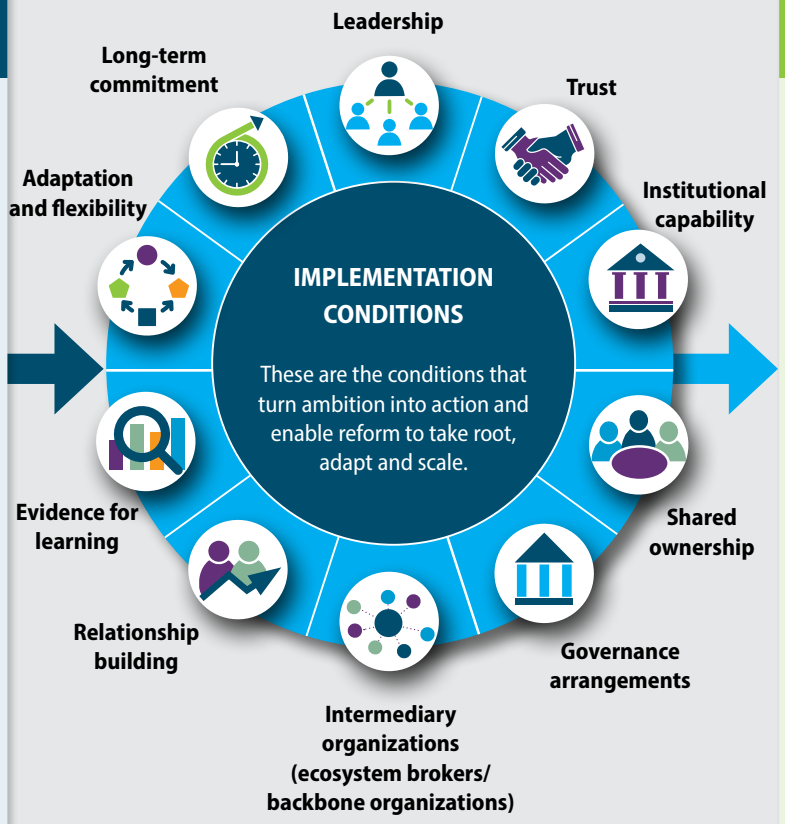
Ultimately, the conference demonstrated that many of the building blocks for TVET transformation already exist. The challenge now is not to imagine a different future, but to strengthen the enabling conditions that allow that future to be realized. If partnerships, leadership, institutional capability and trust continue to be strengthened alongside innovation, the examples showcased during the conference suggest that moving from promising initiatives to lasting system transformation is not only achievable, but in many contexts already under way.

FIGURE 3: What enables TVET transformation? Insights emerging from the BILT Bridging Event

ESTABLISHED TVET PRIORITIES

Strong consensus already exists around the directions of reform:

- Partnerships
- Work-based learning
- Innovation
- Digital transformation
- Flexible pathways
- Inclusion
- Labour market responsiveness



SUSTAINED SYSTEM TRANSFORMATION

When the right conditions are in place, reforms translate into lasting impact:

Institutionalization
Reforms embedded in systems, policies and practices

Scaling
Promising initiatives expanded across sectors and regions

Future-ready TVET systems
Responsive to technology, innovation and changing skills needs

Inclusive growth
More opportunities for participation and decent work

Resilient partnerships
Stronger and more sustained across sectors and communities

Continuous improvement
Learning, adaptation and evidence inform ongoing progress

The future of TVET will be determined not by new priorities, but by our ability to strengthen the conditions that enable implementation and sustain transformation.

Source: Authors

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Advancing TVET through industry partnerships and innovation

Discussion paper

This discussion paper analyses how Technical and Vocational Education and Training (TVET) systems can respond to rapid technological change, evolving labour markets and growing demands for inclusion and sustainability. Drawing on insights from the 2026 UNESCO-UNEVOC BILT Bridging Event in Durban, South Africa, the paper brings together experiences from Africa, Asia, Europe, and Latin America and the Caribbean to consider how partnerships are reshaping skills development and supporting more responsive, future-ready TVET systems.

BILT Bridging Events are part of UNESCO-UNEVOC's Innovation and Excellence in TVET project, contributing to the initiative 'Towards a Global TVET Agenda' (TGTA). This multilateral initiative is led by the German Federal Ministry for Education, Family Affairs, Senior Citizens, Women and Youth (BMBFSFJ) and coordinated by the German Federal Institute for Vocational Education and Training (BIBB).

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4 QUALITY EDUCATION

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