

TVET

.Asia

Skills for Tomorrow:

Transforming Asia's Workforce

Through TVET Innovation

- Digital Skills Revolution in SE Asia
- Green TVET: Jobs for a Sustainable Future
- Bangladesh TVET: Progress & Challenges
- Industry 4.0 & New Apprenticeship Models
- Women in TVET: Breaking Barriers

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From the Editor's Desk

Dr. Rina Matsumoto, Editor-in-Chief | TVET.Asia Magazine | June 2026

Welcome to the inaugural issue of **TVET.Asia Magazine** — a dedicated publication for professionals, policymakers, educators, and stakeholders across the Technical and Vocational Education and Training landscape in Asia. This magazine was born from a simple but powerful conviction: that skills development is the cornerstone of Asia's future prosperity.

Asia is home to more than 60% of the world's youth population. By 2030, over 400 million young Asians will enter the labour market. The challenge — and the opportunity — is staggering. TVET systems across the continent must adapt rapidly to Industry 4.0, the green economy, and a digitalised world, while addressing persistent issues of quality, equity, and public perception.

“ TVET is not a second-choice path — it is the frontline of economic transformation. ”

In this issue, we explore dynamic shifts in TVET across Asia — from Bangladesh's National Skills Development Policy to Vietnam's digital TVET initiatives; from India's Skill India Mission to Indonesia's vocational revolution. We also cover gender inclusion, international cooperation, quality assurance frameworks, and the vital link between TVET and youth employment.

I warmly invite readers to engage with **TVET.Asia** — share your stories, research, and innovations. Follow us on X @tvetasia, YouTube @tvetasia, LinkedIn and Pinterest: tvetasia. TVET.Asia is your voice, your platform, and your community.

Dr. Rina Matsumoto

Editor-in-Chief, TVET.Asia Magazine

TVET IN ASIA: AN OVERVIEW

85M+

TVET Learners in Asia

38+Countries with National TVET
Policy**22%**Youth in TVET (Secondary
Level)**\$2.4T**GDP Contribution from TVET
Skills

TVET.Asia WORKFORCE

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The Scale and Scope of TVET in Asia

Technical and Vocational Education and Training (TVET) in Asia encompasses a vast array of institutions, programmes, and delivery modalities — from formal polytechnics to community-based apprenticeships. TVET serves as a critical bridge between education and productive employment across the region's 48 countries and 4.7 billion people.

Asia's TVET landscape is characterised by remarkable diversity. East Asian nations like South Korea and Japan boast long-established, highly regarded vocational systems. South Asian nations such as Bangladesh, India, and Pakistan are pursuing ambitious reform agendas, while Southeast Asia leads a new wave of digital and green TVET innovation.

Key TVET Challenges Across Asia

- Misalignment between training curricula and labour market demands
- Low social prestige of TVET compared to academic pathways
- Inadequate funding and ageing infrastructure in many countries
- Shortage of qualified, industry-experienced TVET trainers
- Limited access for marginalised groups — especially women and rural youth
- Weak quality assurance and cross-border recognition of qualifications

DIGITAL SKILLS REVOLUTION IN SOUTHEAST ASIA

DIGITAL SKILLS

Coding • AI • Cloud • IoT



Coding, Cloud, and Connectivity: How TVET is Going Digital

By Priya Subramaniam | Technology & Skills Correspondent

Southeast Asia's digital economy is growing at breakneck speed, and TVET systems across the region are under mounting pressure to produce tech-ready graduates. Countries like Malaysia, Vietnam, Thailand, and the Philippines are leading the digital TVET transformation.

Malaysia's **Digital Skills Initiative (DSI)** has embedded modules on data analytics, cybersecurity, AI fundamentals, and cloud computing into over 200 polytechnics and community colleges. Graduate employment in tech-related roles increased by 34% within two years of launch.

“ Southeast Asia's digital economy is projected to reach \$1 trillion by 2030 — TVET.Asia tracks every step of this journey. ”

Vietnam's GDVT has partnered with Samsung, Intel, and LG to co-design curricula that reflect real industry needs. Students gain access to industry-standard labs, corporate mentoring, and guaranteed internship placements — a model that TVET.Asia considers exemplary for the region.

Digital TVET: Key Success Factors

- Strong public-private partnerships with technology companies
- Regular curriculum reviews aligned with emerging technology trends
- Investment in high-speed internet and modern computing infrastructure
- Upskilling of TVET trainers in digital and blended pedagogy
- Micro-credentials and stackable qualifications for lifelong learning

GREEN TVET: SKILLS FOR A SUSTAINABLE FUTURE

GREEN TVET
Solar · Wind · Sustainability



Building the Green Workforce Asia Needs

By Jin-Ho Park | Environment & Skills Policy Analyst

As Asian governments race to meet net-zero commitments under the Paris Agreement, TVET systems face an urgent new mandate: training a green-skilled workforce. Solar installation, energy-efficient construction, sustainable agriculture, and circular economy operations all demand new competencies at every level of the labour market.

South Korea's **K-TVET Green Initiative** retrained over 120,000 workers in green manufacturing and renewable energy within three years. Bangladesh, Indonesia, and the Philippines are integrating green skills into existing TVET curricula — a pragmatic approach enabling faster scaling with ILO Green Jobs Programme support.

“ The green economy will create 24 million new jobs globally by 2030 — Asia must train for every one of them. ”

Sector	Key TVET Skills	Growth Potential
Renewable Energy	Solar/wind installation, grid tech	Very High
Green Construction	Eco-design, energy efficiency	High
Sustainable Agriculture	Organic farming, water mgmt	High
Waste Management	Recycling tech, circular economy	Medium-High
E-Mobility	EV maintenance, battery systems	Very High

BANGLADESH TVET SECTOR: PROGRESS & CHALLENGES

Towards a Skilled Bangladesh: The Road Ahead

By Md. Ashrafuzzaman | Senior Correspondent, Dhaka

Bangladesh has made significant strides in reforming its TVET sector over the past decade. The **National Skills Development Policy (NSDP) 2022** sets ambitious targets: to triple TVET enrolment to 3 million students by 2030 and ensure 30% of secondary-level students enrol in technical education streams — aligned with Bangladesh's LDC graduation aspirations.

The Bangladesh Technical Education Board (BTEB) oversees over 9,000 institutions offering technical and vocational qualifications. The National Skills Qualification Framework (NSQF) aims to create a unified, internationally recognised credential system. The government's 2030 roadmap envisions TVET as the backbone of export diversification.

“Bangladesh's demographic dividend — 170 million people, 60% under 35 — is its greatest TVET asset.”

Indicator	Current (2026)	Target (2030)
TVET Enrolment	~1.2 Million	3 Million
Govt. Institutions	~650	1,000+
Private Institutes	~8,500+	12,000+
Certified Trainers	~40,000	80,000
Female Enrolment	~30%	45%
Industry Partnerships	~1,500	5,000+

Key Challenges for Bangladesh TVET

- Limited industry engagement in curriculum design
- Shortage of qualified, industry-experienced trainers
- Weak quality assurance at institutional level
- Insufficient career guidance and counselling services
- Social stigma around vocational vs. academic pathways
- Geographic disparities in access (urban-rural divide)

INDUSTRY 4.0 & NEW APPRENTICESHIP MODELS

Rethinking Work-Based Learning for the Digital Age

By Tanaka Hiroshi | Labour Economics Researcher, Tokyo

Industry 4.0 — automation, AI, IoT, and advanced robotics — is fundamentally altering the nature of work. For TVET, this means not just updating curricula, but reinventing the entire pedagogical model. Work-based learning (WBL) and apprenticeship systems are being redesigned across Asia to reflect new industrial realities.

Japan's **dual apprenticeship model** is undergoing a significant digital overhaul. Young apprentices rotate through smart factory environments gaining hands-on exposure to AI-assisted quality control, robotic welding, and predictive maintenance systems. Toyota and Panasonic have invested heavily in co-designing next-generation frameworks.

China's **Modern Vocational Education System (MVES)** targets 10,000 high-quality vocational schools by 2025, with Industry 4.0 competencies embedded as core graduate attributes. Online simulations, AR/VR training modules, and AI-based assessment tools define China's TVET modernisation drive.

“The factory of the future needs workers who can think critically, adapt rapidly, and collaborate across disciplines.”

Emerging TVET Competencies for Industry 4.0

- Artificial Intelligence & machine learning fundamentals
- Robotics process automation and CNC/CAD operations
- IoT device management and industrial sensor systems
- Data literacy and basic programming (Python, SQL)
- Cybersecurity awareness for industrial environments
- Critical thinking, problem solving, and adaptability

WOMEN IN TVET: BREAKING BARRIERS

Gender Inclusion as a Driver of TVET Excellence

By Fatimah Binte Yusof | Gender & Development Specialist, Kuala Lumpur

Despite significant progress, gender inequality remains one of TVET's most persistent structural challenges in Asia. Women are systematically underrepresented in technical fields — engineering, construction, automotive, and ICT — while overrepresented in traditionally 'feminine' sectors. ADB research indicates closing gender gaps in TVET could boost regional GDP by up to 7% by 2030.

“ When women thrive in TVET, communities, industries, and entire economies thrive with them. ”

Nepal's **Women in Technical Trades** programme has successfully enrolled women in electrical, plumbing, and construction TVET programmes through targeted scholarships, female role models, and community engagement addressing cultural barriers. TVET.Asia profiles this programme as a model for the region.

Strategies for Gender-Responsive TVET

- Targeted scholarships and stipends for women in non-traditional trades
- Safe and gender-sensitive learning environments and facilities
- Female role model and mentoring programmes
- Community and family engagement to shift social norms
- Flexible learning options for women with caregiving responsibilities
- Gender-disaggregated data for monitoring and accountability

COUNTRY SPOTLIGHT: INDIA

India's **Skill India Mission**, launched in 2015, has trained over 100 million people across diverse sectors through 15,000+ Industrial Training Institutes (ITIs), Pradhan Mantri Kaushal Kendras (PMKKs), and Jan Shikshan Sansthan. The National Skill Qualification Framework (NSQF) provides a 10-level competency structure aligned with National Occupational Standards.

India's TVET ecosystem faces the challenge of scale and quality simultaneously — with 1.4 billion people and roughly 12 million new labour market entrants each year. Recent reforms focus on Recognition of Prior Learning (RPL), 37 Sector Skill Councils (SSCs), and TVET integration into the school curriculum under National Education Policy 2020.

India's SSC model — 37 industry-led bodies developing standards, assessments, and curricula — stands as a replicable innovation. From IT to healthcare, construction to beauty and wellness, SSCs bridge industry demand and training supply across Asia's largest democracy.

COUNTRY SPOTLIGHT: VIETNAM

Vietnam has undergone a remarkable TVET transformation under the Vocational Education and Training Law (2014). The country has expanded its vocational college network, introduced quality accreditation systems, and built partnerships with leading international TVET systems in Germany, Australia, and South Korea.

The General Directorate of Vocational Education and Training (GDVT) has identified 26 high-demand occupational areas for priority development, including ICT, mechatronics, logistics, tourism, and agri-processing. Selected 'high quality' colleges are being upgraded to deliver programmes comparable to OECD-country qualifications.

International cooperation has been a cornerstone of Vietnam's reform. Germany's GIZ and Australia's DFAT have both been long-term partners, supporting curriculum reform, trainer development, and quality assurance. Vietnam demonstrates the power of sustained strategic international partnership — a lesson TVET.Asia champions across the region.

COUNTRY SPOTLIGHT: INDONESIA

Indonesia's vocational system — **Sekolah Menengah Kejuruan (SMK)** — is one of Asia's largest, with over 14,000 vocational high schools enrolling approximately 5 million students. President Jokowi's Vocational Education Revitalisation Programme aims to transform SMKs into centres of industry-linked excellence.

The revitalisation effort focuses on updating curricula to reflect industrial needs, upgrading workshop equipment and facilities, and developing 'teaching factories' where students produce goods and services for real markets. Dual-system learning — combining classroom study with structured workplace training — is now mandatory across key sectors.

Indonesia faces the particular challenge of delivering quality TVET across 17,000 islands. Distance learning, mobile TVET units, and community learning centres are reaching rural populations. Indonesia's archipelago TVET experience offers crucial lessons for other large, geographically dispersed nations — a topic TVET.Asia will continue to report on.

FUNDING & INVESTMENT IN ASIA'S TVET

Sustainable and adequate funding remains the Achilles' heel of TVET systems across Asia. Despite rhetorical commitment from governments, per-student spending on TVET typically lags far behind academic education, and private sector investment remains inconsistent.

The Asian Development Bank (ADB), World Bank, and bilateral donors continue to play a critical role in financing TVET reform. ADB's TVET portfolio exceeds \$2 billion, supporting programmes across Bangladesh, Indonesia, the Philippines, Cambodia, and beyond — focused on systemic reform rather than simply building more classrooms.

Singapore's **SkillsFuture** levy model — where employers contribute a percentage of payroll to a national skills fund — has generated billions in sustainable training investment and is being studied by Bangladesh, Vietnam, and the Philippines as a potential model.

Key Funding Modalities in Asia TVET

- Government budget allocations (primary source in most countries)
- Skills development levies on employers (Singapore, Malaysia model)
- Bilateral development assistance (Germany, Australia, Japan, UK)
- Multilateral loans and grants (ADB, World Bank)
- Private sector investment through industry training funds
- Social enterprise and NGO-led community TVET financing
- Learner fees and income-contingent loan schemes

INTERNATIONAL PARTNERSHIPS & COOPERATION

International cooperation has become a defining feature of TVET reform in Asia. Unlike academic education, TVET's close connection to industry makes it inherently open to international standards, cross-border qualifications, and global value chain integration.

UNESCO's **UNEVOC Network** connects over 270 TVET institutions across 130 countries, facilitating knowledge exchange, research, and capacity development. In Asia, the network has been instrumental in supporting curriculum reform, trainer development, and TVET policy advocacy — areas where **TVET.Asia** actively contributes content and analysis.

ASEAN's Mutual Recognition Arrangements (MRAs) are gradually creating pathways for TVET graduates to have their qualifications recognised across borders — a critical enabler for labour mobility. The ASEAN Qualifications Reference Framework (AQRF) maps national qualifications to a common regional scale.

“ No country can build a world-class TVET system in isolation — regional and global collaboration is the key to shared capability. ”

QUALITY ASSURANCE IN TVET

Quality assurance (QA) is the bedrock of any credible TVET system. Without robust QA, qualifications lose signalling value for employers, graduates cannot trust their training will translate into jobs, and governments waste scarce resources on low-impact programmes.

Singapore's **SkillsFuture Framework** is Asia's gold standard — providing industry-validated information on 35+ sectors, covering job roles, skills requirements, and training pathways with regular reviews to stay current with occupational trends.

Leading QA systems share common features: a national qualifications framework (NQF) defining learning outcomes by level; an external accreditation body for training providers; competency-based assessment with industry involvement; and transparent, public performance data.

Elements of a World-Class TVET QA System

- National Qualifications Framework (NQF) with defined competency levels
- Independent accreditation of training providers and assessors
- Industry involvement in standard-setting and assessment design
- Regular external review and international benchmarking
- Transparent public reporting of graduate outcomes data
- Learner and employer satisfaction measurement systems

DIGITAL TRANSFORMATION OF TVET DELIVERY

DIGITAL SKILLS

Coding · AI · Cloud · IoT

The COVID-19 pandemic forced TVET institutions across Asia into rapid digital adaptation. The sector now understands more clearly what digital delivery can and cannot achieve: theory and knowledge transfer work well online, but the practical, hands-on nature of most TVET remains irreplaceable in person.

Augmented Reality (AR) and Virtual Reality (VR) are offering new possibilities for safe, scalable skills practice. In Korea, VR-based welding simulators have cut training costs by 40% while improving competency outcomes. In India, AR maintenance training for industrial machinery is being piloted across 50 ITIs with promising results.

“ Technology is a tool, not a substitute for skilled TVET pedagogy — excellence comes from blending both intelligently. ”

YOUTH EMPLOYMENT & TVET LINKAGES

TVET's fundamental purpose is enabling productive, decent employment. Yet in many Asian countries a troubling disconnect persists between TVET completion and meaningful labour market outcomes. Graduate tracer studies reveal high rates of skills mismatch, underemployment, and migration to informal-sector work.

Addressing the TVET-employment nexus requires action on multiple fronts: robust labour market information systems; career counselling helping learners make informed choices; employer engagement in curriculum design; and job placement services that bridge the transition from training to work. **TVET.Asia** advocates for all four pillars.

The ILO's Work4Youth programme highlights the importance of soft skills — communication, teamwork, work ethic — alongside technical competencies. Employers consistently rate these as equally important to occupational skills in determining graduate employment outcomes.

What Employers Want: Top Graduate Competencies

- Technical/occupational skills relevant to the specific job role
- Problem-solving and critical thinking in work contexts
- Communication skills — verbal, written, and digital
- Professionalism, reliability, and strong work ethic
- Teamwork and collaboration across diverse groups
- Digital literacy and technology adaptability
- Initiative, entrepreneurship, and continuous learning mindset

SUCCESS STORIES FROM THE FIELD

Rafi's Journey: From Dropout to Digital Professional

■ Bangladesh

Rafi, 22, left school at 16 due to family financial pressures. After completing a six-month digital marketing TVET programme at a Dhaka polytechnic, he secured a role with a Bangladeshi e-commerce startup, earning three times the national minimum wage. Today he manages social media campaigns for clients across South Asia — and mentors other school leavers considering TVET as a career pathway.

Maria's Welding Revolution

■ Philippines

When Maria enrolled in a welding programme in Cebu, she was one of only three women in a class of thirty. She graduated top of her cohort, secured a maritime welding contract, and now mentors young women entering non-traditional TVET trades through a local NGO. Her story featured by TVET.Asia reached over 50,000 readers.

The Green Farmer: Solar Irrigation in Nepal

■ Nepal

After completing a 3-month solar irrigation systems TVET course, Bishnu returned to his village in Chitwan District and installed a community irrigation system. Farm yields increased by 60%, and Bishnu now trains other farmers across the district as a freelance TVET practitioner — proof that TVET's impact extends far beyond the classroom.

Aini's Coding Dream: From Rural Java to Tech Startup

■ Indonesia

Aini grew up in a village in East Java with no access to computers. At 19, she enrolled in a free digital skills programme under Indonesia's SMK revitalisation. After graduating she co-founded a fintech startup serving rural communities, raising \$200,000 in seed funding — a story that illustrates the transformative power of accessible, quality TVET in the digital age.

STATISTICS & DATA DIGEST

85 Million+	TVET learners currently enrolled across Asia (2026)
38 Countries	in Asia with a formal National TVET Policy in place
\$2.4 Trillion	estimated GDP contribution of TVET-trained workforce in Asia
22%	of Asian secondary students enrolled in TVET (target: 35% by 2030)
34%	increase in TVET graduate employment in digital sectors — Malaysia (2024)
120,000+	workers retrained in green skills under South Korea's K-TVET programme
10 Million	new TVET graduates needed annually in Asia to meet labour market needs
45%	of Asian TVET institutions now offering hybrid or online delivery (2025)
100M+	people trained under India's Skill India Mission since 2015
5 Million	students enrolled in Indonesia's SMK vocational schools

Sources: ADB, UNESCO-UNEVOC, ILO, World Bank, National TVET Authorities, TVET.Asia Research (2026)

UPCOMING EVENTS & CONNECT WITH TVET.Asia

ADB TVET Forum 2026

September 14–16, 2026

■ Manila, Philippines — Annual gathering of TVET policymakers, practitioners, and donors across Asia-Pacific.

UNESCO-UNEVOC World Congress

October 2026

■ Bonn, Germany + Virtual — Global TVET thought leadership event — strong Asian country participation expected.

ASEAN Skills Competition

November 2026

■ Kuala Lumpur, Malaysia — Biennial competition showcasing the best TVET talent across ASEAN member states.

Bangladesh National TVET Summit

December 2026

■ Dhaka, Bangladesh — Forum on TVET reform progress, industry linkages, and the 2030 skills agenda.

ILO Global Apprenticeship Conference

January 2027

■ Geneva + Virtual — Focus on work-based learning innovations and apprenticeship policy in Asia.

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