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TVET@Asia Issue 26: The Impact of Artificial Intelligence (AI) on Technical and Vocational Education and Training (TVET)

Artificial Intelligence (AI) is not merely another technological trend for Technical and Vocational Education and Training (TVET); it challenges some of its foundational assumptions. As AI reshapes occupational profiles and production processes, TVET systems are compelled to reconsider what constitutes vocational competence, how skills are assessed, and who benefits from technological change. It is influencing changing skill demands, driving curriculum transformation, and redefining approaches to teaching, learning, and assessment. As a result, AI is becoming an increasingly influential force in the way vocational education is designed, implemented, and experienced. This issue aims to examine the dynamic relationship between AI and TVET and to highlight emerging developments at this critical intersection.

The contributions in this issue demonstrate that AI integration in TVET is neither linear nor uniform. Instead, it unfolds across unequal infrastructures, diverse institutional cultures, and contrasting pedagogical traditions. The tension between technological innovation and structural constraint emerges as a recurring theme throughout the issue.

The first article, JOBURG MAHUYU, focusing on Zimbabwe, critically examines the impact of equity, inclusiveness, and the digital divide on AI adoption in TVET institutions. Drawing on mixed methods research, the study highlights significant disparities in infrastructural readiness between urban and marginalised institutions. The findings demonstrate that AI adoption risks reinforcing existing inequities unless systemic infrastructure gaps, and socio-economic disparities are addressed proactively. The article calls for national AI strategies, strengthened digital literacy, and sustained public–private collaboration.

The second contribution, SONAL NAKAR & LOUISE MISSELKE, shifts attention to leadership responses in England and Australia. Framed through uncertainty reduction theory - a framework that explains how actors seek stability in ambiguous environments - the study explores how VET leaders interpret and manage AI adoption amid workforce pressures, heavy workloads, and sectoral status challenges. Interestingly, AI implementation often emerges as a crisis-driven innovation rather than a top-down policy directive. The research illustrates how leaders balance informal experimentation with regulatory compliance, facilitating intergenerational knowledge exchange while navigating organisational risk cultures. It underscores that technological transformation is inseparable from structural and workforce realities.

Complementing the leadership lens, the third article, TOOCHUKWU COLLINS NWAKILE, CHIAMAKA FRANCISCA IZUAKOR, CHRISTIAN BASIL OMEH & DANIEL UCHENNA CHUKWU, presents a multi-dimensional assessment of TVET educators' readiness for AI-supported instruction. Based on a large-scale survey, the study reveals moderate AI readiness and digital literacy, but strong pedagogical adaptability and positive attitudes towards AI. The interrelated nature of competencies suggests the emergence of a "readiness ecosystem." Nevertheless, the limited engagement with advanced AI-enabled instructional practices indicates the need for systematic professional development and institutional integration frameworks.

The fourth article, ADELINE Y.S. GOH & SUMARDI H.A. HAMID, turns to Brunei and examines how adult educators—including those in TVET—currently understand, use, and evaluate AI in their professional practice. Based on survey data, the study shows a generally positive orientation towards AI, particularly regarding its usefulness for teaching, assessment, and administration. At the same time, it highlights important gaps in confidence, ethical awareness, and access to structured professional development. By proposing a multi-layered strategy for strengthening AI competence within a broader digital competence framework, the article positions educators not merely as adopters of technology, but as critical practitioners who mediate between AI, pedagogy, equity, and learner agency.

Expanding the conversation into creative disciplines, the fifth article, GOUHAR PIRZADA, investigates the integration of AI into Art and Design TVET curricula in Pakistan. Through expert focus group discussions, the study identifies both promising opportunities—such as fostering hybrid technical-creative skill sets—and significant challenges, including ethical considerations and curriculum revision. The findings reinforce the importance of proactive curriculum design, clearly defined learning outcomes, and continuous educator upskilling to ensure that TVET remains relevant to the evolving digital economy.

Finally, the sixth article, TS NORZARINA BINTI HAMIZAN & ZAHABAR BIN MOHD SALIM, introduces an innovative vision of an AI-enhanced virtual reality (VR) machine workshop for CNC machining training. By aligning AI and immersive technologies with Industry 4.0 demands, the study illustrates how emerging technologies can transform practical skills training environments, bridging the gap between simulation and industrial practice. Such initiatives demonstrate the potential of AI not only as a support tool but as an integral component of next-generation TVET ecosystems.

Taken together, these contributions reveal a striking contrast: while some contexts struggle with basic digital infrastructure and equitable access, others experiment with immersive and AI-oriented training environments aligned with Industry 4.0. AI integration in TVET therefore does not follow a single trajectory of progress; it represents a differentiated and uneven transformation shaped by national, institutional, and socio-economic conditions. This multidimensional landscape encompasses infrastructure and equity, leadership and organisational culture, educator competencies, professional learning, curriculum reform, and technological innovation. Ensuring that such transformation remains inclusive and ethically

grounded requires deliberate and context-sensitive strategies rather than technological enthusiasm alone. As TVET continues to play a central role in workforce development and sustainable economic growth across Asia and beyond, it is imperative that stakeholders move beyond reactive adoption towards strategic, evidence-based transformation. We hope that this issue encourages critical engagement with AI in TVET—not as an inevitable technological destiny, but as a domain of strategic choice, ethical responsibility, and collective design.

The Editors of Issue 26:

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