Chapter 10
Technology-Enhanced Learning as a Catalyst for Inclusive and Future-Ready Vocational Teacher Education

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ABSTRACT

The rapid digital transformation of education and work has positioned Technology-Enhanced Learning (TEL) as a vital driver in vocational teacher education. This chapter examines how TEL can empower educators to deliver inclusive, future-ready training aligned with evolving labor market needs. It explores pedagogical innovations such as blended learning and virtual simulations, alongside inclusive practices

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like OER integration and multilingual design to address equity gaps. Case studies from Germany and Kenya highlight how TEL fosters engagement, cost-effectiveness, and accessibility in both high- and low-resource contexts. Furthermore, the chapter critically analyzes barriers such as infrastructure gaps and educator readiness while proposing a holistic, equity-driven framework. Future directions involving AI, AR/VR, and adaptive learning systems are also discussed. The study offers insights for policymakers, researchers, and educators aiming to build resilient, inclusive TEL ecosystems in vocational education.

INTRODUCTION

Increased pace of digital transformation has completely altered the work world and the educational arena. Technology-Enhanced Learning (TEL) has become an important phenomenon in this regard, which offers learners a new possibility in inclusive, flexible and future-proofed learning, redirection of vocational teacher education. As labor markets demand constantly evolving skills sets, it is now facing vocational teachers with the prospect of providing education capable of equipping learners to cope with complex and technology based working environments. The inclusion of TEL will not only assist in learning digital literacy but also the innovation of new ways of teaching that provoke the interest and equality of the learners in any environment (Hämälainen and Cattaneo, 2015a). Its adoption in both inter-regional and reliant on resource, institutional preparedness, and teacher competence is unequal. And these issues can be solved methodically through consideration of digital pedagogy, inclusivity, and policy frameworks which allow sustainable adoption (Aarthi et al., 2025). This chapter will explore the impact of the use of TEL as a catalyst and equity-based innovative solution to teacher education in vocational training as a means of harmonizing theory with global practice and contextual resolutions.

The Role of TEL in Redefining Vocational Pedagogy

Technology Enhanced Learning (TEL) aims at changing the vocational pedagogy so as to give a teacher and trainers new avenue to deliver content and test skills and learning that is transferable in the present digital economy. Traditionally, vocational teacher education has relied heavily on vocational style, face-to-face education founded on practical prowess. Though it is necessary, TEL goes a step further through pedagogical possibilities to create digital simulations, web-based collaboration platforms, and adaptive learning systems that recreates the conditions of the workplace in adaptable and versatile ways (Widiaty & Ana, 2015). This kind of transition allows the educators to leave the fossilized approach and shift towards

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