

Chapter 10

Micro–Credentials in Vocational and Professional Training

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ABSTRACT

This chapter explores the integration of micro-credentials within vocational and professional training, emphasising the transformative potential when combined with artificial intelligence (AI). Micro-credentials offer flexible, skill-specific certifications that align closely with the evolving demands of the workforce, providing rapid upskilling and targeted competency development. By leveraging AI, these credentials can be enhanced through personalised learning pathways, efficient assessment methods, and secure validation processes. This synergistic approach not only supports lifelong learning and continuous professional development but also addresses the dynamic needs of the 21st-century job market, fostering a more adaptive and skilled workforce.

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INTRODUCTION

In recent years, education has been significantly transformed by technological advancements and the evolving needs of the global workforce. One of the most notable developments in this area is the rise of micro-credentials, which are compact, skill-specific certifications designed to provide learners with targeted competencies and knowledge. These credentials have gained considerable traction in vocational and professional training, where flexibility, relevance, and rapid upskilling are paramount. Unlike traditional degrees, which often require years of study, micro-credentials can be completed in a shorter time-frame, making them more accessible, manageable, and cost-effective. Micro-credentials are available in various formats, such as digital badges, nanodegrees, and certificate programmes, and are designed to validate specific skills and competencies that enhance an individual's employability and support lifelong learning pathways (Kohler et al., 2021; Healy, 2021). The demand for micro-credentials has been further accelerated by the COVID-19 pandemic, which has disrupted traditional education and training systems worldwide, highlighting the need for more flexible, accessible, and targeted learning options (Güçlü Aydoğan et al., 2024; Soon & Ismail, 2021). In this context, micro-credentials have emerged as a critical bridge to employment in the post-pandemic world, enabling individuals to quickly acquire the skills needed to remain competitive in the job market.

At the same time, artificial intelligence (AI) has made substantial inroads into education, reshaping traditional teaching and learning processes through personalisation, automation, and data-driven insights (Orak & Turan, 2024). AI technologies have the potential to significantly enhance the value of micro-credentials by enabling personalised learning experiences that are tailored to the individual needs and preferences of each learner (Charles & Charles, 2024). By analysing learner data, AI can provide personalised recommendations for micro-credentials that align with each learner's career goals and learning pace, ensuring that they acquire the skills and knowledge most relevant to their professional development. Moreover, AI-driven systems can play a crucial role in assessing learner competencies, offering real-time feedback and adaptive learning paths that are essential in today's dynamic educational landscape (Azzam & Charles, 2024). This chapter aims to critically examine the integration of micro-credentials with AI in vocational and professional training, exploring how these technologies can enhance the creation, delivery, and validation of micro-credentials, thereby supporting lifelong learning and continuous professional development.

Micro-credentials, which emerged in the early 2010s as a flexible and targeted alternative to traditional educational pathways, have become an essential component of modern education (Soon & Ismail, 2021). Micro-credentials have not only supported immediate skill needs but also emerged as pivotal elements in modern

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