Chapter 12
Redefining Learning Pathways:
The Impact of AI-Enhanced Micro-Credentials on Education Efficiency

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ABSTRACT

AI-enhanced micro-credentials can optimize learning pathways, improve access to education, and boost workforce skills, according to this report. It addresses traditional education delivery model issues and an increasing requirement for lifelong learning. An AI expert system tool called EDMENTUM validates credentials and customizes learning routes in the quasi-experimental study on AI-enhanced micro-credentials and learning efficiency. Discussing micro-credentials history and integration with AI, case examples show their practical use. The document also emphasizes linking education with industrial demands and addressing fairness, access, data privacy,

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and security issues for policy and practice. AI-enhanced micro-credentials have many benefits, but careful design and execution are needed to maintain data transparency, trust, and management.

INTRODUCTION

Micro-credentials can help to address both challenges by providing granular learning pathways, assessment, and digital records (Pirkkalainen et al., 2023) (Ward et al., 2023) (Laughlin, 2021). Recent progress in AI technology promises to further enrich the potential of micro-credentials as tools to manage the evolving talent needs of employers. In this paper, we review the promise, challenges, and implications of AI-enhanced micro-credentials for creating learning pathways that are more efficient for a rapidly changing job market.

The capacity of the education sector to support workforce skills development has significant implications for economic growth and social equity. However, traditional education delivery models face a number of constraints for this purpose. One challenge is how to effectively combine, sequence, and integrate a broader range of learning experiences throughout individuals' working lives (Ajjawi et al., 2020) (Cantor et al., 2021) (Pohl et al., 2021). A second challenge is that education credentials often poorly capture rapid and typically experiential learning in the workplace. As a result, talented individuals from socioeconomically disadvantaged backgrounds, recent immigrants/returnees whose education was otherwise interrupted, or who gained workforce experience as a primary path to personal development may be excluded from consideration for desirable job opportunities, with resulting higher unemployment, lower incomes, and weaker labor force participation.

1.1. Background and Rationale

We describe an AI-enhanced methodology for providing micro-credential feedback to learning professionals, known as mentors, who can use the feedback to enhance the quality of educational pathways. Because these pathways can be online, security is enhanced due to the use of secure micro-credentials. The feedback is based on quality, personalized insights that come from DCS according to individual learning using machine learning models (Song et al., 2023) (Guni et al., 2021) (Tulloch et al., 2020). The result is that both the learning professional rewards and the education pathways are optimized more quickly and efficiently than possible through

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