



Chapter 6

Blockchain Revolution in Education and Lifelong Learning

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ABSTRACT

The current chapter presents an overview on the importance of blockchain technology in the field of education and lifelong learning. It discusses the existing blockchain models applicable to the education sector such as decentralized student records and credentials verification systems, secure and transparent transaction platforms for micro-credentials, and blockchain-based student identity management systems. Sustainable blockchain-led strategies and framework for responsible blockchain for empowering the stakeholders involved, enhancing educational innovation and infrastructure, and reducing the inequalities are discussed. Moreover, the chapter throws light on the innovative practices to revolutionize traditional education systems, credentialing, and payment methods, offering several significant benefits to the world of higher education.

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INTRODUCTION

Blockchain technology has significant potential in the education sector and lifelong learning. The peer-to-peer distributed ledger technology is revolutionizing the management and transactions of data. It securely stores transactions and student records, eliminates manual processes, reduces cost, decentralizes data, and promotes integration between the network users (Bucea-Manea-Țoniș et al., 2021). The technology is implemented within educational institutions based on the blocks created to validate each record. Since the records are permanent and cannot be revoked, technology provides the potential for securing transparency in micro-credentials, student identity management system, verification of transcripts, and provides easy access to shared resources (Arenas & Fernandez, 2018) (Meria et al., 2021). Despite numerous benefits and incredible applications across the education sector, the technology faces certain challenges in its implementation due to the cost involved, scalability, security, and interoperability. Regardless of these implementation challenges, there exist strategies and framework that promote responsible and ethical use of blockchain in the education sector. These strategies provide solutions to overcome the challenges around scalability, interoperability, integration, and common framework and regulations using smart contracts and private blockchain systems (Anwar et al., 2022). Further, it is crucial to transform blockchain-led education into a sustainable model to foster equality within the education sector and empower the stakeholders. Cooperation between the network users, diversity between the interacting agents, access to shared resources, and educational logistics are a few strategies that facilitate transparent and accountable systems for tracking and managing sustainability initiatives within academic institutions (Son-Turan, 2022).

This chapter contributes to the existing literature in the following ways: First, it provides insights into the IT infrastructure and computing solutions to transform a traditional higher education system where there exists an informal exchange of resources to more formal and secure shared resources using a centralized ledger framework. Secondly, it provides how innovative and revolutionary technology benefits and empowers the education stakeholders such as the instructors, administration, management, and learners. Thirdly, the chapter discusses strategies for sustainable blockchain in the education sector that actively contribute towards the UN SDG -4 Quality Education, SDG – 9 of ‘Industry, Innovation, Infrastructure’, and SDG - 10 of ‘Reduces Inequalities.’ Establishing a quality network cooperation and enhancing interoperability assists in resolving interaction and engagement within the larger community and accomplishing quality education (SDG -4). Last but not least, despite the challenges of implementing blockchain in the education sector, the chapter proposes strategies such as scalability, interoperability, a common legal

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