Chapter 5
Blockchain Revolution in Education

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ABSTRACT

Blockchain technology has the potential to revolutionize higher education by enabling the secure and efficient sharing of academic records, digital credentials, and other important information. This chapter explores the potential of blockchain technology to transform higher education by examining its key features, benefits, and challenges. It also discusses several use cases of blockchain in higher education, such as student records management, digital credentialing, enabling micro-credentials and digital badges, and learning analytics. The study concludes by highlighting the opportunities, limitations, and future directions of blockchain technology in higher education. The chapter will propose future trends and the way forward for the revolution to advent. The major stakeholders will be explored: Learners, teachers, government, top education management, UNDP, technocrats, and major corporates involvement and consensus. Expert opinion is consolidated to suggest the blockchain education framework.

INTRODUCTION

The Higher Education sector is currently experiencing a significant transformation due to advancements in technology. One such innovative technology that has the potential to revolutionize learning and credential verification is blockchain technology (Oke et al., 2020; Mohanta et al., 2019). Blockchain, being a decentralized and distributed ledger system, creates a secure and unalterable record of transactions. This record can be shared and verified by multiple parties without the need for intermediaries. The impact of blockchain technology has already been observed in various industries, and now it is set to make its mark on the Higher Education sector (Alammary et al., 2019).

The potential of blockchain in Higher Education is vast. It can provide secure and transparent records of academic achievements and credentials. Additionally, it enables the implementation of micro-credentials and digital badges, facilitates the creation of decentralized learning platforms, and promotes the sharing of educational resources. One significant issue that blockchain can address is credential fraud and the prevalence of fake degrees (Cheng et al., 2020).

However, there are challenges and limitations to implementing blockchain in education. Technical, social, and legal barriers need to be overcome to fully utilize the capabilities of blockchain technology (Alam et al., 2020). Several use cases of blockchain technology in Higher Educationalready exist. Platforms like Learning Machine, Sony Global Education's Higher Education Infrastructure, ODEM, the University of Bahrain's degree verification platform, and Parchment have successfully demonstrated how blockchain can provide learners with secure and tamper-proof methods of verifying their academic achievements (Alshahrani et al., 2021). Various successful use cases of blockchain technology in Higher Educationalready exist, showcasing its potential in revolutionizing the way academic achievements are verified.

Blockchain applications in Higher Education have shown varying levels of success, with some being widely adopted while others are still in the early stages of development. To fully harness the potential of blockchain in education, more research and development are needed to overcome technical, social, and legal challenges (Aisyah et al., 2022); (Alsobhi et al., 2023). However, the benefits of blockchain technology in Higher Education are vast. It provides a secure and transparent system for storing and sharing data, addressing security and privacy concerns. The use of encryption algorithms ensures data integrity and makes it difficult for unauthorized users to access or modify data (Carmichael et al., 2023); (Vaigandla et al., 2023) . The decentralized nature of blockchain eliminates the risk of cyberattacks on centralized databases (Steiu, 2020). Smart contracts automate verification processes and can be used to award degrees and certificates, reducing time and costs. Blockchain can securely store academic records, facilitate collaborative research, and track donations

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