

# Using Blockchain and Tokens for Education: Fad or Here to Stay?

Emre Erturk  
Eastern Institute of Technology, New Zealand  
eerturk@eit.ac.nz

## Keywords

Blockchain, Educational Management, Educational Technology, ICT in Education

## Abstract

A blockchain is a shared digital ledger, which permanently records and encrypts transactions and distributes them to all members in the network, thereby maintaining full history along with security. Blockchain technology has recently been developed and used by a variety of industries, including but not limited to: cryptocurrency, insurance, government, healthcare, supply chain, luxury items, and art. Blockchain technology has already been implemented in education by some institutions and consortiums, for example, to set up an autonomous and online storage and authentication system for diplomas and certificates. Another potential blockchain use for educational administration is evaluating, awarding, and storing transfer credits between different institutions.

However, automating these types of functions through blockchains often require an initial investment as well as economies of scale. The anti-thesis of needing a blockchain system to manage complicated transactions around learning objects, credits and qualifications between multiple institutions is to standardise these items across institutions (for example, by merging institutions and programmes, and centralising their administrative units and databases). However, such a transformation itself would open another door of opportunity for a blockchain system: using it for securing, archiving and retrieving legacy records [learning assets, qualifications, and transfer credits), without having to be handled by administrative staff any longer. This is another typical and effective way of using blockchain as an autonomous, smart, and secure database system.

Tokens are encrypted packets of data in distributed blockchain systems, used to represent stores of value, e.g., for work that has been done and credits earned. The blockchain marketplace rewards contributors for creating learning resources while participants can acquire and use tokens to access resources. In a distributed peer-to-peer blockchain application, users' smart contracts allow them to participate according to an autonomous logic. Completion of learning transactions contribute to the students' contracts, which reflect the students' educational completions, credits, and achievements.

This paper reviews the literature around recent examples of blockchain technology used by universities, large organisations (such as UNICEF, World Bank, and IMF), and private

educational companies around the world. The review also covers records management and the use of tokens and smart contracts, and the long-term benefits of Blockchain from this perspective. Then the author drafts and analyses a hypothetical (case study) blockchain system by: 1) explaining the data elements and processes related to tertiary learning activities and earning course credits, and 2) illustrating the components and workflow of the system, for example, using IT industry standard Unified Modelling Language (UML) diagrams. This analysis also briefly mentions regulatory, economic, and operational factors. As a result, there is a good overview of how feasible a blockchain system may be in this case study context. This work-in-progress paper aims to build recommendations for educational managers and technologists (also in a New Zealand context) around the alternative and innovative blockchain concept, as well as what we can learn from this discussion that may also apply to other blockchain systems in the future.