



Open Research Online

Citation

Mikroyannidis, Alexander (2021). Decentralising Education Using Blockchain Technology. In: Proceedings of Innovate Learning Summit 2021 (Bastiaens, Theo ed.), Association for the Advancement of Computing in Education (AACE), Waynesville, NC, pp. 241–243.

URL

<https://oro.open.ac.uk/81709/>

License

(CC-BY-NC-ND 4.0) Creative Commons: Attribution-Noncommercial-No Derivative Works 4.0

<https://creativecommons.org/licenses/by-nc-nd/4.0/>

Policy

This document has been downloaded from Open Research Online, The Open University's repository of research publications. This version is being made available in accordance with Open Research Online policies available from [Open Research Online \(ORO\) Policies](#)

Versions

If this document is identified as the Author Accepted Manuscript it is the version after peer review but before type setting, copy editing or publisher branding

Decentralising Education Using Blockchain Technology

Alexander Mikroyannidis, The Open University, United Kingdom

Abstract

The emergence of Blockchain technology promises to decentralise and revolutionise not only the financial world, but also education in various ways. Blockchain technology offers opportunities to thoroughly rethink how we find educational content and tutoring services online, how we register and pay for them, as well as how we get accredited for what we have learned and how this accreditation affects our career trajectory.

This hands-on workshop will explore the different aspects of education and lifelong learning that are affected by decentralisation. More specifically, we will discuss the ways that ePortfolios, accreditation, tutoring, as well as other aspects of teaching and learning can evolve within a decentralised ecosystem based on the Blockchain. Participants will also have the opportunity to try out and evaluate the online platform offered by the QualiChain project for the Blockchain-based award and verification of education and employment qualifications.

The following outlines the structure of this workshop:

1. Presentation: Introduction to Blockchain technology and the QualiChain project (15 minutes).
2. First activity: Participants discuss scenarios for the use of Blockchain technology in education and lifelong learning (30 minutes).
3. Second activity: Participants try out and evaluate the QualiChain platform (30 minutes).
4. Discussion on the overall findings and closing (15 minutes).

Total workshop time: 90 minutes.

Keywords

Decentralisation, Blockchain, Education, Lifelong Learning, Qualifications.

Objectives

At the end of this workshop, participants will have acquired:

- An awareness of what Blockchain technology is, how it is currently being used and what its potential is.
- A good overview of the range of scenarios for the use of Blockchain technology in education and lifelong learning.
- Hands-on experience using the online platform offered by the QualiChain project.
- An insight into best practices for designing a decentralised ecosystem based on the Blockchain.

Topical Outline

Education today is still controlled mostly by educational institutions, which offer quality, credibility, governance, and administrative functions. This model is not flexible enough and poses difficulties in recognising the achievements of a lifelong learner in informal and non-formal types of education. As a result, a lifelong learner's transition from formal to informal education and vice versa can be hindered, as the achievements acquired in one type of education are not easily transferable to another. Generally, lifelong learners have limited control and ownership over their learning process and the data associated with their learning. This indicates the need for a learner-centred model across all types of education, offering learners with a framework for fully controlling how they are learning, how they acquire qualifications and how they share their qualifications and other learning data with third parties, such as educational institutions or employers.

A Blockchain is a publicly shared immutable ledger, which uses crypto-currency techniques to minimise any security risk. This technology offers a decentralised peer-to-peer infrastructure, where privacy, secure archiving, consensual ownership, transparency, accountability, identity management and trust are built-in. Blockchain technology can act as a provenance protocol for sharing data across disparate semi-trusting organisations, without the need for any central control. The value of Blockchain technology at documenting, verifying, and sharing data across diverse stakeholders can be a particularly valuable asset in today's fast-pacing economy, which is largely driven by continuous learning and credentialing.

The QualiChain research and innovation project focuses on the assessment of the technical, political, socio-economic, legal and cultural impact of decentralised solutions on education. QualiChain investigates the creation, piloting and evaluation of decentralised solutions for storing, sharing and verifying education and employment qualifications and explores the potential of Blockchain technology for disrupting the domain of education, as well as its interfaces with private education, the job market, public sector administrative procedures and the wider socio-economic developments.

Prerequisites

This workshop will be useful for researchers, lecturers, technologists and professionals from the education sector, who want to learn about the emerging technology of Blockchain and its use in education and lifelong learning. No prior knowledge on Blockchain technology is required. Some prior knowledge on educational technology will be beneficial, but not mandatory.

Instructor

Dr Alexander Mikroyannidis (PhD, MPhil, BEng) is a Research Fellow in the Knowledge Media Institute of the Open University. He has more than 10 years of research experience in the field of Technology-Enhanced Learning and specifically in personalised learning, self-regulated learning, lifelong learning, open educational resources and rich interactive learning materials, as well as applications of Blockchain technology in education. He is the author of over 100 articles that have been published in peer-reviewed journals, conferences and books.

Dr Mikroyannidis has been driving significant educational technology initiatives at an international level, by establishing a network of collaborators inside and outside the Open University and acquiring external funding, in order to implement and evaluate novel educational solutions in real-life settings and with real users. He has been awarded and worked on a wide range of European and nationally funded research projects, including QualiChain, DEL4ALL, OpenLang Network, Open Networking Lab, Institute of Coding, SlideWiki, EDSA, HUB4NGI, FORGE, weSPOT, EUCLID, ROLE, OpenScout, CASPAR, and PARMENIDES. He is currently leading a pilot for facilitating lifelong learning through decentralisation and Blockchain technology, in the context of the QualiChain Horizon 2020 project. In particular, he is in charge of deploying and evaluating decentralised education and employment qualifications with learners and educators within various lifelong learning contexts.

References

QualiChain project website [Online]. Available: <https://qualichain-project.eu/> [Accessed June 2021].

Mikroyannidis, A., Third, A. & Domingue, J. (2020) A Case Study on the Decentralisation of Lifelong Learning Using Blockchain Technology. *Journal of Interactive Media in Education (JIME)*, 1(23), 1-10.

Mikroyannidis, A., Third, A., Domingue, J., Bachler, M. & Quick, K. (2020) Blockchain Applications in Lifelong Learning and the Role of the Semantic Blockchain. In: Sharma, R. C., Yildirim, H. & Kurubacak, G. (Eds.) *Blockchain Technology Applications in Education*. IGI Global.

Mikroyannidis, A., Third, A. & Domingue, J. (2019) Decentralising Online Education Using Blockchain Technology. *Online, Open and Flexible Higher Education Conference: Blended and online education within European university networks*. Madrid, Spain.