

KNOWLEDGE FOUNDATION

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FOUNDATION

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COLLABORATORS

- Immersive Education Initiative (USA)
- Lucerne University of Applied Sciences and Arts (Switzerland)
- Massachusetts Institute of Technology (MIT) Bitcoin Club (USA)
- University of Oxford Blockchain Research Centre (UK)
- University of Zurich Blockchain Center (Switzerland)
- Yale University Blockchain Club (USA)
- Brown University Blockchain Club (USA)

INTERNATIONAL PARTNERS

- United Nations Global Resource for Anti-Corruption Education and Youth Empowerment (GRACE) initiative
- United Nations Office on Drugs and Crime (UNODC)

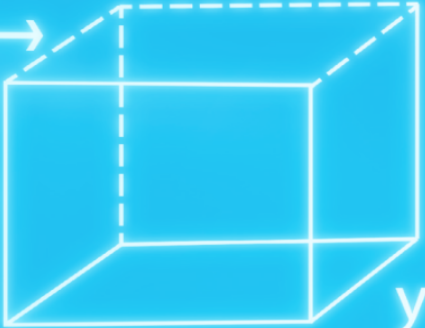
Education and blockchain

$2a$
 $ab+ac = a(b+c)$
 $a\left(\frac{b}{c}\right) = \frac{ab}{c}$
 $\left(\frac{a}{b}\right) = \frac{a}{b}$
 $f(x) \leq 5$
 $X^2 - 4X + 5 \leq 5$
 $X^2 - 4X < 0$
 $y = a$


n_2
 $\frac{a}{b} + \frac{c}{d} = \frac{ad+bc}{bd}$
 $n(C) = 84$
 $n(B \cup C) = n(B) + n(C) - n(B \cap C)$

$\bar{x}_1 = \frac{1+3+3+6+8+9}{6} = 5$
 $\bar{x}_2 = 2+4+4+8+12 = 30$
 $\bar{x}_3 = 4+7+1+6 = 18$

$\log_b b^x = x$
 $\log_a x = \frac{\log_b x}{\log_b a}$
 $\log_b (x^r) = r \log_b x$
 $\log_b (xy) = \log_b x + \log_b y$
 $\log_b \left(\frac{x}{y}\right) = \log_b x - \log_b y$

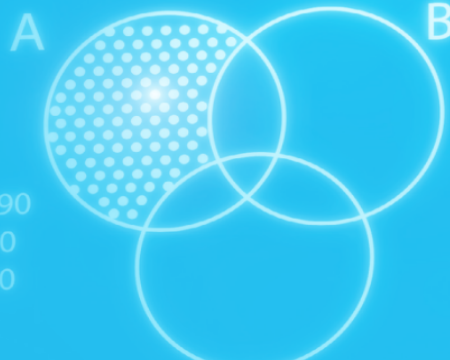
$20 \rightarrow$
 $6 \rightarrow$


x
 $a(bc) = (ab)c$
 $a+b = b+a$
 $a(b+c) = ab+ac$
 $126 = 6xy$
 $2x + 2y = 20$

$He = 4.002602$
 $Na = 22.989769$
 $Ar = 39.948$


$(100^2)a + 100b$
 $10000a + 100b - 5$

$a_n = \frac{1}{2^{n-1}} =$
 $= \frac{1}{2^9} =$



$(x) (2x+3) = 90$
 $2x^2+3x-90 = 0$
 $(2x+15)(x-6) = 0$

x

UNESCO

EDUCATION AND BLOCKCHAIN EXCERPTS

UNITED NATIONS EDUCATIONAL, SCIENTIFIC AND CULTURAL ORGANIZATION

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Summary : "Blockchain is a potential game changer in education"

"Blockchain is a shared, decentralized and secure ledger technology to record and store digital transactions of almost any digital assets including digital identities, medical and educational records, birth and marriage certificates, skill credentials and digital contracts.

Promising initiatives with blockchain demonstrate that it is already possible to deploy the technology to cover credentialing and certification in both formal and non-formal learning settings.

This publication demonstrates and assesses the emerging practices of applying blockchain technologies in education for "unlocking" specific online educational materials such as lessons, courses and textbooks that are directly relevant to that learner's academic path..."

2024 South Africa Blockchain in Education Symposium & Hackathon

2024 Oxford Blockchain in Education Summit & Hackathon

The following UNESCO report excerpts are provided as informational context for the 2024 Blockchain in Education Symposium, Summit and Hackathons:

- **Stellenbosch University, South Africa:** February 06-7, 2024. Held in collaboration with South Africa's National Institute for Theoretical and Computational Sciences and the Switzerland-based Knowledge Foundation international standards organization.
- **Oxford University, United Kingdom:** April 09-11 April. Held in conjunction with the 2024 Digital Civilisation conference, University College Oxford Blockchain Research Centre and Switzerland-based Knowledge Foundation international standards organization.

For details visit:

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Foundation principles and concepts

Since its emergence over a decade ago, blockchain has been positioned as a technology with the potential to transform society and change the way humans transact and interact. Yet leaders across industries have often seemed unsure about what to do with it.

This report starts from a shared recognition that blockchain can serve as a pragmatic solution to problems across industries and that the technology is in a state of constant evolution from a capable yet underdeveloped technology to a more refined and mature solution poised to deliver on its initial promise to disrupt.

Executive Summary

- Blockchain is a ground-breaking technology whose affordances and limitations are only just being understood.
- Blockchain is a digital verification infrastructure that solves the problem of how to verify digital identity, one of the building blocks of all digital services.
- Shortcomings in centralized digital repositories can be mitigated when digital credentials are mapped on a blockchain.
- Beyond the credentialing of learning, there are other areas in the education sector where blockchain technology can be applied.
- Blockchain does not follow a 'one-size-fits-all' model.
- Contemporary applications of distributed ledger technologies are at an inflection point, with the momentum shifting from research and pilot projects to the building of practical applications. Enthusiasm for the potential of any evolving technology such as blockchain must be tempered with recognition of its maturity, shortcomings and risks.
- The implementation of blockchain-based solutions calls for an interdisciplinary and comprehensive approach.
- Initiatives in the education sector continue to be affected by the need for consensus among stakeholders with seemingly divergent agendas and capacities.

"Blockchain might provide a viable alternative to the current procedural, organizational and technological infrastructure required to create institutionalized trust."

Why use a blockchain?

Blockchains allow users to prove their identities, protect ownership of digital assets and verify transactions without an intermediary.

Five reasons to use a blockchain:

1. **Transparency**: Anyone with access to the network can view a history of transactions in real time.

Potential impact: A money trail can be tracked and monitored more accurately in areas like aid distribution.

2. **Immutability**: Blockchains protect data from being tampered with; no single entity is able to change past data without alerting the network.

Potential impact: Immutability protects areas like voter authentication and land title registrations.

3. **Reduced counterparty risk (and subsequently lower-cost payments)**: Blockchains allow anyone to send money to anyone without an expensive or corrupt intermediary being involved.

Potential impact: Money sent across borders or into natural disaster zones will move quickly. In addition, many critical elements of our economy allow people to trade with each other without fear that the other party will back out. Banks perform this function, but they often add high administration costs and slow processing times to the system. Blockchain's smart contracts guarantee that a contract will be fulfilled when a specific action is completed.

4. **Efficient provisioning of identities**: Blockchains can create and manage identities for people at a lower cost and in a more secure manner through digital signature technology, which gives people a public key (similar to an account number) and a private key (similar to a password).

Potential impact: Marginalized and underserved populations, like the underbanked and unbanked, may secure unprecedented access to services.

5. **History of itself**: Most centralized databases keep information that is up to date at a particular moment. They are effectively a snapshot of a moment in time. Blockchain databases can keep not only information that is relevant now, but also all the information that came before.

Potential impact: Blockchain technology can create databases that have histories of themselves. They grow like ever-expanding archives of their own history while also providing a real-time self-portrait. The expense required to compromise or change these databases has led people to call a blockchain database immutable.

Blockchain and its application in education

The fundamental processes, inputs and outputs within the education system represent opportunities to put the technology to meaningful use – for example, digital credentials and transcripts, student identity and record management, blockchain based payments, intellectual data management and smart contracts.

Affordances provided by the use of blockchain technology:

- Uses of certificates issued to learners
- Uses of certificates for accreditation
- Uses of certificates for tracking intellectual property
- Uses of certificates for financial matters

Usage areas

- Notarization of intellectual property rights on blockchains
- Educational funding, performance-based pay and microcredit for education via blockchain
- Payment of tuition fees via blockchains
- Minimization of confidential student information
- Management of student identity within educational ecosystems
- Creating a decentralized educational Web via a blockchain
- Decentralized social apps for education
- Voting
- Decentralized autonomous organizations
- Research lifecycle management
- Examinations

"The automatic accumulation and transfer of credits could be one of the most desirable use cases for blockchain technology ... Blockchain facilitates scenarios that may contribute to significant cost-savings for all parties involved in issuing and verifying certificates."



2024 SOUTH AFRICA BLOCKCHAIN SYMPOSIUM

Stellenbosch University | February 06 - 07

The inaugural **South Africa Blockchain in Education Symposium** and hackathon will be hosted by **Stellenbosch University** on February 6th and 7th in collaboration with **South Africa's National Institute for Theoretical and Computational Sciences** and the Switzerland-based **Knowledge Foundation** international standards organization.

For details visit:

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Blockchain in Education Symposium, Summit and Hackathons
<https://KnowledgeFound.org/go>



2024 OXFORD ENGLAND BLOCKCHAIN SUMMIT

Oxford University | April 09 - 11

The **2024 Blockchain in Education Summit** and **Digital Civilisation** conference come together for a special joint event at Oriel College, Oxford University, in collaboration with the **Knowledge Foundation** and **University College Oxford Blockchain Research Centre**.

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