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Blockchain Technology Promises Innovation in K-12 Record Keeping

Emerging peer-to-peer technology could help elementary and high school records become more portable.

by Erin Brereton

Erin Brereton has written about technology, business and other topics for more than 50 magazines, newspapers and online publications.

Imagine a world in which a fifth-grader could take a Saturday class at a museum, and the fifth-grade teacher could easily access the attendance information from a digital repository to grant appropriate class credit.

That type of **unified approach to tracking and rewarding formal and informal learning could someday become a reality**, thanks to the emergence of blockchain technology, according to Jason Swanson, director of strategic foresight at advisory learning organization, KnowledgeWorks Foundation.

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Instead of a single point of authority, a blockchain system relies on a global online database to validate information. **Each action is recorded, identities are encrypted and information is automatically entered, potentially providing considerable security.**

People often associate the technology with the cryptocurrency bitcoin, which uses it.

"As a new action ends up on the ledger, a verification process bundles it into blocks and chains them together; that continues as a train of transactions that are known to be accurate," Swanson says. "It essentially relies on the network to continually say, 'This is good.'"

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Blockchain Boosts Portability and Security

Roughly two years ago, the software engineering-focused Holberton School, an early blockchain adopter in San Francisco, **began using staff-built software and bitcoin's publicly available blockchain to help employers access students' academic certificates**.

"You don't have to maintain anything; that's what's so good about it," says Holberton co-founder Sylvain Kalache. "When someone graduates, the software pushes the information to the blockchain."

K–12 settings could seemingly support a similar use. Higher education institutions could access blockchains to obtain K–12 standardized test scores or acquire homeschooled students' progress.

A blockchain containing students' academic histories might also make relocating an easier process, says Jim Flanagan, chief learning services officer at ISTE.

"The ability to have portability and greater trust would be hugely beneficial," Flanagan says. "When a family travels to another country, shouldn't they be able to have ready access to those records and keep building on that?"

Schools also can program **automated smart contracts stored on blockchains to carry out additional tasks, such as automatically scheduling a tutor in response to a student's academic issue**.

Teachers, too, could utilize the technology to receive credit for completing professional development requirements.

Changes to Blockchain Tech Needed for K–12 Adoption

Blockchain technology does present a few challenges. For example, **schools would need to consider a process to correct any errors**.

"The probability of something being entered in error would be low to nil, but I can't go in and change records without the change being rejected or an alarm going off," Swanson says. "That has serious implications when talking about student data, because it has verified what's being entered as being true."

For extensive adoption, the **transaction-chain verification speed would likely also need to be improved**.

"If you had a large district using it for attendance, that would be 2,000 to 5,000 entries a day," Swanson says. "By the end of the year, it would be verifying everything from day one. That's time-consuming."

As a relatively new technology, however, the biggest obstacle blockchain faces may be its young age.

"It's a mindshift of what does a decentralized network for authority look like," Swanson says. "A lot of educators don't really get it, but we already have the IT infrastructure. Blockchain technology could change the future of K–12 education and be the backbone for creating a true learning system."

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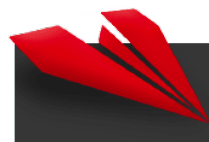
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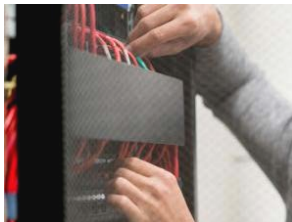
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