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Blockchain is transforming e-Learning

We find out what blockchain technology is and how it can improve online learning.

We often hear about ' **blockchain**' as the technology behind digital currencies. However, not many people are aware that this technology is being introduced into various industries bringing various benefits.

One of the many industries that is about to be enhanced by blockchain technology is the world of e-learning. Today, the world of education consists of private and public training institutions and a number of third-party providers. A substantial amount of personal information is sent between students, institutions and third-party providers as part of the educational or training process. Blockchain technology is proposed as a technology that can safeguard and protect this model of education.
To improve the quality of educational processes and products, there are some important considerations and opportunities for educators, schools offering online education and the development of blockchain in the private sector. In this article we will discover how blockchain technology can improve online learning.

What is blockchain technology?

To better understand how blockchain is revolutionising the world of education, it is important to understand what this technology is. Blockchain is perceived as a technology used for Bitcoin that allows transactions to be recorded on a distributed ledger across a network of users, in a decentralised manner and protecting the integrity of the data. In other words, blockchain is a technology that **provides a system for recording information in a way that makes recorded information impossible to modify, hack or control within the system**. Blockchain technology is essentially a shared ledger that is impossible to modify or delete and is duplicated and distributed across the entire network of computer systems in the blockchain. The blockchain therefore allows for the collection of data and information. With the support of other technologies, this data can be organised and analysed in order to obtain more detailed information based on this data.

How blockchain adds value to online learning

It is not difficult to imagine how a technology that allows for the collection of data can be useful to elearning. The enormous growth of the education sector in an increasingly dynamic global context has posed many challenges for administrators. The business of keeping paper records is primitive, becoming increasingly complex and now requires the support of technology. Blockchain has emerged as a viable technology to overcome the challenges of recording and managing learning certificates. Like many industries, the world of elearning is being transformed by an increasing ability to collect data and use it to improve user performance. Let's take a closer look at some of the benefits that blockchain has brought to online learning.

1. Storing and tracking data

Blockchain technology stores information in batches called blocks. The blocks are linked together chronologically to form a parallel line. If data is saved once, it is not editable or cannot be rewritten. However, it is possible to modify the stored block. In this case, the system tracks the change by indicating that X has changed to Y at a given time. Blockchain technology thus has a **non-destructive approach** to tracking data changes over time.

2. Credentials and digital badges

Another way in which blockchain technology has improved online learning is through the creation of secure digital badges and certificates that can be easily verified and displayed on digital platforms.
This issue is important for educational institutions because since the birth of the internet, it is difficult to verify that a certificate is valid. Many organisations have collaborated and collaborate with third-party companies to secure certification programmes based on blockchain. This method guarantees verification of digital credentials and integrates with a wide variety of digital tools

and systems. Additionally, universities have always owned and controlled the records of students, who have had to rely on institutions to access and share their academic history and achievements. This technology would ensure that students would always have their certifications at their fingertips, without having to depend on educational institutions for a copy of their certifications.

3. Cryptocurrencies in education as rewards

If blockchain were to be introduced into education, it would offer the possibility of rewarding students through cryptocurrencies. There are cases where this approach has been successful; in fact, it would motivate students to finish the curriculum quickly.

4. Decentralised e-learning platforms

An interesting aspect of blockchain is the possibility of offering **decentralised educational platforms**. These platforms are managed by consensus rather than by a central authority and are digital places where people can earn money by sharing their knowledge, skills and experience. With blockchain, we can consider the possibility of sharing a platform that is not solely owned by a single educator. In this case, blockchain technology makes a peer-to-peer learning experience possible and encourages standardisation across institutions.
On these platforms, instructors can upload their content at the price they prefer and students only have to pay for the desired module, but not for the entire course.

Blockchain and online learning are a powerful combination

There is no doubt that the application of this technology to the world of education is a powerful combination that will become the norm in the future. Blockchain technology in e Learning improves the quality of institutions and education offered and increases the possibility of using smart solutions.

Obstacles for blockchain technology in education
Although the premises are encouraging, the available data testify that there are still several obstacles for teachers and educational institutions. For blockchain technology in the education sector to grow further, these obstacles need to be removed. According to a recent survey, almost 50 per cent of respondents in the higher education sector said they were not interested in using blockchain technology. The main obstacles are as follows:

1. Security
2. Scalability
3. Adoption rate
4. Costs

1. Security

Security is a major concern in all sectors, but when it comes to the digital world, it becomes a particularly sensitive topic. In blockchain, sensitive information is stored in blocks and institutions have to think about what data to store and why. Policy-supported educational institutions must implement strong data security if they want to implement blockchain. This security can be improved with blockchain authorisation and encryption of data on the blockchain.

2. Scalability

Scalability is another obstacle to the use of blockchain technology in eLearning. **Educational institutions possess a huge amount of data** on their student teachers. This creates scalability problems with blockchain technology. When the amount of data increases, the number of blocks also increases. Precisely because of the large number of blocks, the speed of transactions slows down, as all transactions require peer-to-peer verification.

3. Adoption rate

Like other previous technologies, **blockchain only works when a sufficient number of institutions and employers rely on it**. Graduates only benefit from the ownership of their credentials if the schools or companies they apply to accept its validity. But

with hundreds of schools already issuing and accepting blockchain credentials and a network of job sites promoting their adoption, they may soon become the rule rather than the exception.

4. Costs

Although it can lead to savings in other areas, the adoption and implementation of a new technology can be quite expensive. The cost is related to the computing power and the **necessary modifications to the existing infrastructure**, and may increase. In addition, many institutions may not have the knowledge and skills to manage student data on a blockchain platform, so they may have to invest in training school administrators on how to use the technology, which can cost money and time.

The Future of Blockchain

The report by the European Commission's Joint Research Centre (JRC) concludes with an important observation about blockchain: the future of this technology depends on complete transparency.
The importance of this technology, according to the experts, stems from two factors that blockchain is able to guarantee: ownership of the recipient and independence from the provider.

- **Ownership of the recipient**

With blockchain technology, students are able to manage their own credentials. It is they, and not the educational institutions, who control their credentials.

- **Provider independence**

Without a provider, no one can share, transfer or validate records and data on the blockchain. The MIT Media Lab and Learning Machine developed Blockers, an open standard for providing and verifying credentials, to try to avoid a standards war that could force educational institutions and organisations to use digital credential providers.

Conclusion

Blockchain is already fundamentally changing the financial sector through cryptocurrencies. This technology could also have a transformative effect in the education sector, simplifying document storage and sharing, improving security and trust, simplifying the recruitment process and giving students ownership of their academic records for life.