

# Utilization of Blockchain Technology for Future Education

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## Abstract

*Blockchain is a distributed ledger that is both decentralized and distributed. There is a Node that acts to keep track of all transactions on the Blockchain across all networks. Due to the immutable or immutable nature of Blockchain technology, the risk of fraud is extremely low. In the realm of education, this is unquestionably a highly practical and safe technology for conducting digital certification, recording, and so on. It is envisaged that Blockchain technology would be able to tackle difficulties that frequently arise in the field of education. The blockchain-based educational architecture has enormous promise for minimizing the degree of cheating that is so prevalent in the educational environment. This study employed a multi-method approach, with the goal of examining Blockchain-based education design, Blockchain features used, and Blockchain-based educational services as a consequence of the study. Each of these areas is critical to the implementation's success.*

**Keywords :** Blockchain, Education, Networking

## 1. Introduction

Blockchain technology is a technology that self-regulating and decentralized, as well as create open records that have been executed of computerized events or all transactions and will be distributed to the participating parties [1]. To show the authenticity of each transaction on Blockchain, it will be verified with a sign digital hand. Information stored on Blockchain will be sealed and immutable, because use of digital signatures and encryption [2]. In carrying out this technology, it is necessary security, so users don't worry about data privacy they provide. people can see the future of Blockchain technology in this today as a developing technology, because increasing interest in information technology and communication globally, this causes changes in all fields, including education [3]. In the interest of technology, technology Blockchain is felt to have a positive effect [4]. This Innovative Technology is used in several applications such as education, business industry, nursing health and governance, because all transactions that implemented in Blockchain nature transparency, immutability, and security [5]. Technology Blockchain provides a fair mechanism by complete transparency properties to fund designs education and grants, as well as being the cause lack of advanced cheating occurs [5]. Blockchain security can also be used in the management process of a



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scientific journal as a security supporter of journal management itself, can also be used for authenticity a diploma [6]. Blockchain in education by using Blockchain features.

Some of the designs are, Sony Global Education, Origin-Stamp, Edgecoin, GradeBase and TeachMePlease, this design keeps getting more and more every time [7]. Various Blockchain framework designs in the world of education is introduced to the advantage that the user will get, this is made to change the current education system [8]. The latest educational trends can be described through existing gap [9].

The latest educational trends provide view of the gap between blockchain and implementation. Scalability issues being one of some of the existing problems. The scalability is defined as the time taken to reach consensus and put transactions in block [10]. Data records that have become part Blockchain as well as being hosted on the network decentralized then immutable, this is what Blockchain means in simple terms [11]. Blockchain is peer to peer, where data or records that have been distributed will be safe inside cryptography [12].

## 2. Research Method

The research was conducted by using the literature study method. The literature study method is a method that. This is done by seeking information from various scientific journals, literature, books, and expert opinions on the topic which is relevant [13]. Performed by analysis of related journals and searched by blockchain keywords in education or blockchain in education. Also conducted a search for websites that apply blockchain technology in education [14]. With this method, it will be easier for writers to find various information in accordance with this research.

## 3. Findings

Based on the problems described above, we suggest forming a gamification layer that Attractive at the basic level of application as well as an easy-to-understand and simple interface. It is potential to be able to increase motivation and also the curiosity of users (in this case students) to continue to participate actively in implementing the gamification application. In addition, this gamification layer must, implied or not, provide education to users, but it should be noted that the delivery of this education needs to be delivered with an interesting way to be able to get the full focus of the user so that the information you want to convey is channeled well.

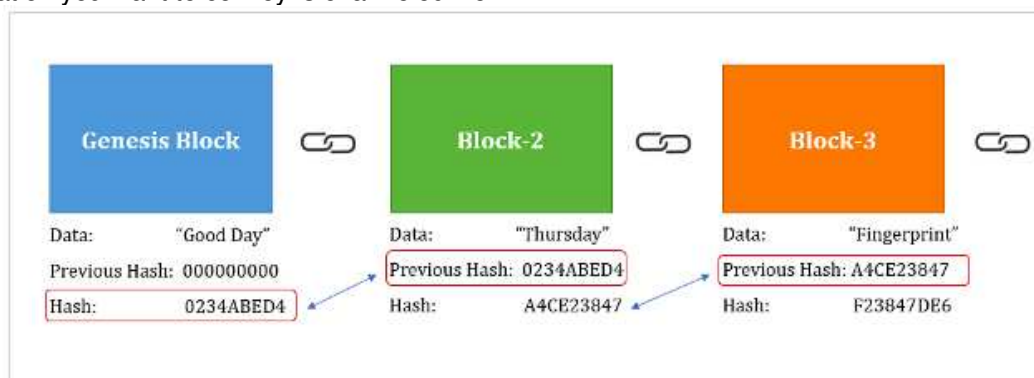


Figure 1. Structure Blockchain

Delivery of this education can be implemented by adding some additional features such as methods learning using flashcards [15], the use of pictures that can trigger user interest, and using games (of course we will not explain this further) such as puzzles, word search, and the like, also with level, point, and reward features that can be a support in improving user motivation in the learning process [16]. Giving points and rewards to users when able completing a challenge is able to provide



satisfaction to the user, besides providing opportunities secondly to the user is also able to increase the user's curiosity in completing their mission [17]. With In these ways, users/students are able to learn without them knowing it [18]. In other words [19], we are able to force the user to learn in a fun way without having to make them bored or even frustrated like learning with traditional methods [15]. In relation to awards, awards are given to users who have achieved outstanding achievements extraordinary things in the learning process need to be applied in a structured and fair

manner [20]. This is due to achievement extraordinary users require more effort and ability than effort and ability users in general, so this proper reward needs to be implemented [21].

This award can be: dynamic rankings of users, as well as bonuses that certain users can receive after reaching certain stages. Blockchain technology is here to solve this problem, where transactions are validated by the system before being permanently stored in an interconnected and decentralized data record. Every user can check the correctness of a data at any time. This makes the data on the Blockchain almost non-existent can be faked. Blockchain is built using pre-existing technology [22]. The main technology that Blockchain used is Asymmetric key encryption, hash function & hashchain, and peer to peer network. Asymmetric key encryption is an algorithm that uses a public key (public key) as the key to encryption process and use a private key for the decryption process. So only people which holds the private key that can access the data in the blockchain. Hash is a collection of letters and numbers that become identities so that the validity of the information can be verified without disclosing information from the data in it [23].

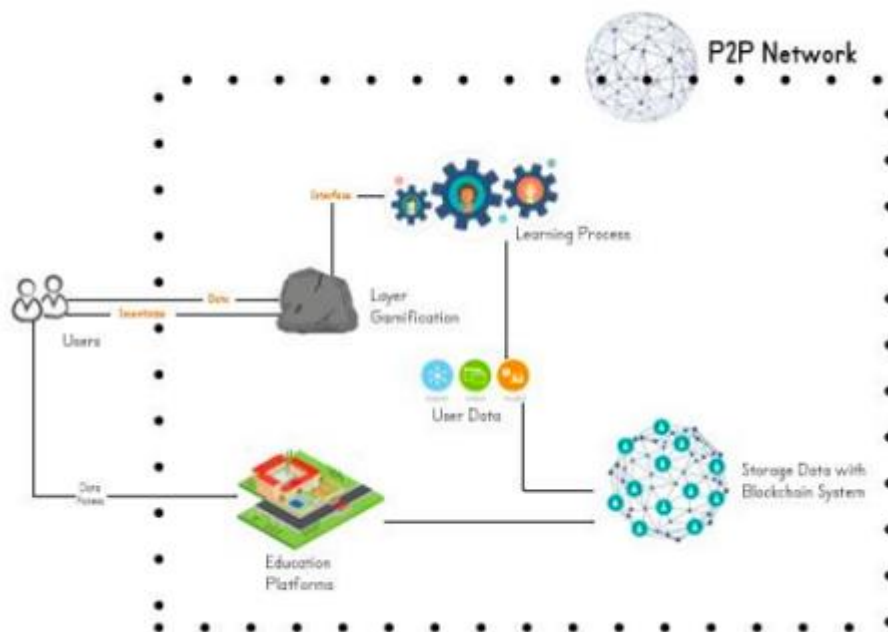


Figure 2. Proposed Model

Transactions using blockchain technology are peer-to-peer, which means a data can be transferred between users without the help of a third party to process it. The advantages that obtained by utilizing blockchain technology is that an organization does not have to depend on one server (server) because all data will be replicated throughout the network (nodes) so as to avoid changes/additions of data without the consent of other members, server down, or hacking crimes user account. One of the main focuses in Blockchain Technology is data security, this makes blockchain is ideal for data storage that is vulnerable to manipulation. In addition, the data recorded in the blockchain is permanent, because if you delete one block it will affect the next block [24].

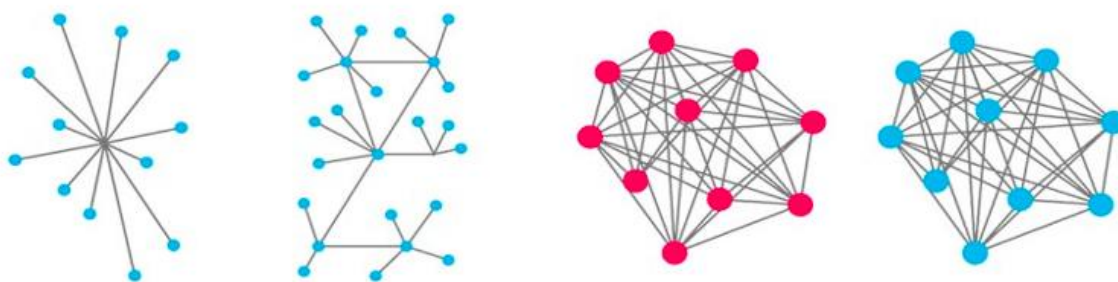


Figure 3. Blockchain Network

The concept of decentralized technology brought by blockchain, allows each server to be connected to each other and have the same role [25]. By establishing a kind of peer to peer network, sending digital currency will be the same as sending an email because there is no longer a central bank to mediate transactions. This centralized concept is what decentralized technology is trying to revolutionize. With the blockchain concept, this system does not have a central authority, but it can still work well. The decentralization brought about by blockchain can also be interpreted as a system, where the overall decision-making is left to the users of the system without any one individual being able to impose his will on other individuals without the consent of the majority of system users.

#### 4. Conclusion

Blockchain framework design that is increasingly growing and many are very useful for individuals or university. Not only that, the presence of technology and very diverse Blockchainbased services has its own benefits, so the benefits lockchain for education world problems a huge amount. One that is developing namely digital certificates based on Blockchain technology, which secures certificates from forgery with perform verification and authentication. In the research continued with the results of the survey quantitatively on the benefits of the application Blockchain in the world of education It can also implemented by the world of education globally, so that more and more people are experience the great benefits of Blockchain. As is Blockchain technology can be a good solution for problems that occur in the world of education. This can be proven by the presence of design frameworks, technologies, and even service-based A very diverse and useful blockchain overcome these problems.

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