Research on the Application of Blockchain Technology in Private University Education

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Keywords: Blockchain; Private university education.

Abstract. In recent years, blockchain technology has been widely used in many fields, and the application of blockchain technology in the field of education has been initially developed. As an important part of the development of the education sector, private college education is of great significance to higher education. This paper analyzes the current problems in private college education, and introduces the application of blockchain technology in private higher education in combination with the characteristics of blockchain technology. The article divides the application of blockchain technology in private higher education into three layers, namely data layer, authentication layer and application layer. The article introduces the application of each layer in detail.

Introduction

In recent years, the development and application of blockchain technology are becoming deeper and wider, and the blockchain is undoubtedly one of the hottest topics in the world. Many countries recognize the huge application prospects of blockchain technology and begin to design the development of blockchain at the national level.

The Development of Blockchain Technology in Education

Blockchain technology has been initially developed in the field of education. The current literature analysis and research show that the application of "blockchain +" education is constantly developing. Around 2013, universities began to form formal courses in blockchain technology, and Nicosia University was one of the best. Universities such as Washington Business School and Hobart Software Engineering College have begun to use blockchain technology to grant learning certification. The University of Cyprus began to use blockchain technology to track and record students' learning processes and results. Many other commercial enterprises and educational institutions have also invested resources to explore the application of blockchain technology in education and teaching. At present, the application of blockchain in the field of education is still in its infancy, lacking systematic and mature application models. With the rapid increase of attention in the field of industry application, universities, as the frontier of knowledge and technology dissemination, pay more attention to blockchain technology. However, compared with the financial field, education services and management applications are far from mature.

Problems in Private College Education

As an important link in the development of education, private college education is of great significance to higher education. However, private college education faces some problems in the process of running a school. (1) There are loopholes in the management system of academic credentials in private colleges and universities, which makes it easy to obtain academic credentials, even the phenomenon of fraudulent academic credentials. Therefore, the national and social acceptance of academic credentials in private colleges and universities are generally not high. (2) The government lacks financial support and teaching resources, so there is a gap between the
software and hardware facilities of running schools and public institutions, which has a certain impact on the quality of teaching. (3) Teacher strength is weak and discipline construction is incomplete. (4) Students in private colleges and universities have uneven learning bases, differences in learning ability. The students’ learning quality is not high, and it is difficult to find employment after graduation.

The Application of Blockchain Technology in the Education Field of Private Colleges and Universities

Blockchain is a decentralized distributed database system, which is participated by all nodes. It can be understood as a public accounting mechanism based on the Internet. All users in the network are responsible for bookkeeping and checking together. The information has authenticity and can’t be tampered with. Blockchain technology has the characteristics of distributed, decentralized, traceable, etc. If the blockchain technology is applied in private college education, it can solve some problems in the process of private college education to a large extent. Therefore, it is very meaningful and valuable to apply blockchain technology to the education of private higher education.

The application of blockchain technology in the field of private higher education can be divided into three layers: data layer, authentication layer and application layer, as shown in Fig.1.

Figure 1. Application Hierarchy Chart of Blockchain Technology in Private College Education.

Data Layer

School Learning. Blockchain technology is used to record students' learning in school, including daily performance, classroom learning, course content, examination type, examination results, homework completion, and related extracurricular activities or practice activities. Once the record is generated, it can’t be tampered with, and it is true and reliable.

Distributed Learning. The most important function of the blockchain is to provide unalterable distributed data records. It can be used in the teaching field to record the learners’ activity in the software system, organize and store the learners’ achievements. The decentralized nature of the blockchain allows any educational institution and learning organization to record learning behaviors and learning outcomes across systems and platforms, and allows learners to keep learning records and data for a long time through the network. The saved content is always there and can't be changed.
**Online Learning.** Many students are well adapted to the modern technology education environment by sharing online courses. Students can access personalized online courses by registering their own accounts. They can also choose courses from multiple institutions or seek educational resources based on specific learning tasks or goals. The curriculum resources connected by the blockchain are far more than the traditional MOOC resource sharing model. The blockchain online platform records when, where and what students have learned. Teachers can master students’ learning progress and interest through the platform.

**Learning in Non-educational Institutions.** Using blockchain technology to develop decentralized education system will help break the situation that educational rights are monopolized by schools or government agencies. In the future, in addition to the educational institutions that are approved by government agencies, such as schools and training institutions, there will be more third-party educational institutions, even enterprises, to assume the role of professional education service providers, and based on the open-source, transparent, non-tampering characteristics of blockchains, to ensure the authenticity and credibility of their educational process and results. Non-school educational institutions will be joined in the market, multiple themes will participate in the formulation of educational content, in line with the concept of training applied talents in private colleges and universities.

**Authentication Layer**

Blockchain technology has the characteristics of distributed recording and storage. If this feature can be applied in the field of education, it will allow any educational institution and platform to carry out cross-system and cross-platform learning behavior and learning results recording. By recording the completion of students' learning tasks, establishing a consensus mechanism, and calculating contracts, students' credit scores, class hours and extra-curricular activities can be automatically calculated. These records can promote the improvement of credit transfer. Colleges and universities can more easily map the complete description to their curriculum catalogue. Inter-school boundaries will be gradually blurred, and learners can choose to study a course in any learning center or training institution independently, and obtain equivalent course certificates to effectively prove their professional knowledge and skills in a certain field. Acquisition of multi-course certificates and accumulation of credits will enable students to apply for diploma certificates recognized by national and international educational organizations.

**Application Layer**

**Acquisition of a Diploma.** Using the blockchain verifiable and tamper-proof storage system to store academic credentials in the blockchain database can ensure the authenticity of academic credentials and diplomas and make the verification of academic credentials more effective, safe and simple. This will become a perfect solution to the fraud of academic credentials and certificates, and greatly enhance the acceptance of academic credentials of Private Colleges and universities.

**Enterprise Units Obtain Relevant Information.** The learners can use the data and documents provided in the blockchain database to prove their learning experience, which can be used as an effective proof for their study and job hunting. These blockchains, which contain detailed learning information for students, will provide one-stop service station based on license for students, employers and institutions, facilitate access, sharing and verification, and ensure that the information has high credibility. According to the students' online learning performance and the performance of their enrolled studies and extracurricular activities during the University period, the recognition maps of students' academic, interest and comprehensive performance can be drawn automatically. These codes can be authorized and shared to the employing units, and the employer can fully understand the students' learning, life, social intercourse, interests and other aspects during the University period. It is conducive to the rapid connection between College Students' training and enterprise employment demand information.
Summary

The application of blockchain technology in private higher education has broken the traditional centralized education model and diversified learning forms. Diversified education mode conforms to the characteristics of students in private colleges and universities, and can connect the cultivation of college students with the needs of enterprises, and conforms to the concept of training applied talents in private colleges and universities.

Acknowledgement

This work is supported by the "13th Five-Year Plan" of Shaanxi Education Science in 2018, the topic name is “Research on the Application of Blockchain Technology in Private Higher Education” and the project number is SGH18H499.

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