# THE MAIN AREAS OF THE BLOCKCHAIN TECHNOLOGY USING IN EDUCATIONAL MANAGEMENT

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***Abstract.*** *The article is devoted to the study of scientific research of scientists from around the world on the use of blockchain technologies in education. The purpose of the article is to systematize the areas of possible use of blockchain technologies in the activities of universities. In the process of preparation of the article the methods of analysis and synthesis, the method of generalization and the comparative method were used. As a result of the research, the main directions of using blockchain technologies in education were systematized: to check the level of accreditation of the university; to identify students at the university; for the organization of the educational process; for lifelong learning; to protect intellectual property; to pay for tuition; to provide loans to students; to verify the authenticity of the issued document on education; for professional education of adults; to rank universities when they receive grant funding. We believe that blockchain technologies in education should use only open sources of information, which will allow them to be used by all stakeholders. At the same time, it is necessary to comply with all the necessary rules for the protection of personal data provided by the laws of different countries. The combination of openness of information and protection of personal data is a major problem that currently faces the possibility of more active use of blockchain technology in education.*

***Keywords:*** *education, education management, blockchain technologies, blockchain technologies in education, diploma, financing, rating.*

***JEL Classification: A20, A29, C99, I23***

***Formulas: 0; fig.: 1; tabl.: 0; bibl.: 6***

**Introduction.** In the conditions of rapid digitalization of the economy, more and more attention is paid to the study of this issue in education as well. Most universities are actively implementing elements of distance and online education, moving to electronic document management and digitalization of educational processes.

Special attention began to be paid to the use of Blockchain technology in education management.

**Literature review.** Blockchain is a system of recording information in a way that makes it difficult or impossible to change, hack, or cheat the system. A blockchain is essentially a digital ledger of transactions that is duplicated and distributed across the entire network of computer systems on the blockchain. Each block in the chain contains a number of transactions, and every time a new transaction occurs on the blockchain, a record of that transaction is added to every participant's ledger. The decentralised database managed by multiple participants is known as Distributed Ledger Technology (DLT). Blockchain is a type of DLT in which transactions are recorded with an immutable cryptographic signature called a hash [1].

An important stage in the integration of blockchain into the educational management system was the Blockchain in Education report [2], prepared at the end of 2017 by the Joint Research Center (JRC) on the instructions of the European Commission. The report analyzes the feasibility, problems, benefits and risks of using

blockchain in schools and universities, and presents scenarios for using blockchain to solve current and future problems in the education sector.

The Hafiza Yumna, Muhammad Murad Khan, Maria Ikram & Sabahat Ilyas in «Use of Blockchain in Education: A Systematic Literature Review» have adopted a systematic literature review approach for the identification and the extraction of relevant information from the shortlisted studies. This study describes existing issues in three aspects physical, digital and financial. The results of the analysis shows that the manipulation risk, difficulty in verification and exchanging record between institutions are the major issues faced by the educational institutions [3].

The Preeti Bhaskar, Chandan Kumar Tiwari & Amit Joshi in «Blockchain in education management: present and future applications» have provided a systematic literature review on blockchain technology in education and offered a detailed understanding of the present scenario in terms of benefits, barriers, present blockchain technology application and future areas where blockchain technology can be implemented in the other fields of education [4].

Among the first blockchain-based systems, which moved from the prototype stage to commercial products, some refer to diplomas. These systems can be found, for example, at MIT, UT Austin, and the University of Nicosia (Cyprus), where digital diplomas are being issued to students.

In management, the value of blockchain technologies is determined by the fact that it allows you to ensure absolute reliability in any relationship and type of human activity.

**Aims.** The purpose of the article is to systematize the areas of possible use of blockchain technologies in the activities of universities.

**Methods.** In the process of preparation of the article the methods of analysis and synthesis, the method of generalization and the comparative method were used.

**Results.** The study of the works of scientists dealing with the use of blockchain technology in education, allowed us to identify the following areas of its use (Figure 1).

**1. Blockchain technologies using to verify university accreditation at all levels.** In this case, not only will educational organizations use digital certificates in the manner described in the previous case, but the accredited organizations themselves will also place their own digital signatures in Blockchain. This will verify not only that student A has actually received a certificate from University B, but also that this University B has been accredited by organization C [6]. Such a system can be used to ensure the system of state accreditation, or to check the availability of specific quality certificates in the educational organization, for example, the NAME certificate in Ukraine or another institution.

**2. Blockchain technologies using of verified personal data to identify students in universities.** After students submit their personal data to the university's admissions committee, they will receive their university ID. The use of biometric identification on smartphones, in combination with these certificates will allow you to identify those who study in any structural unit of the university, such as a library,

gym, cafeteria, dormitory and more. Each of these services will be able to identify students without requiring or storing unnecessary personal information.

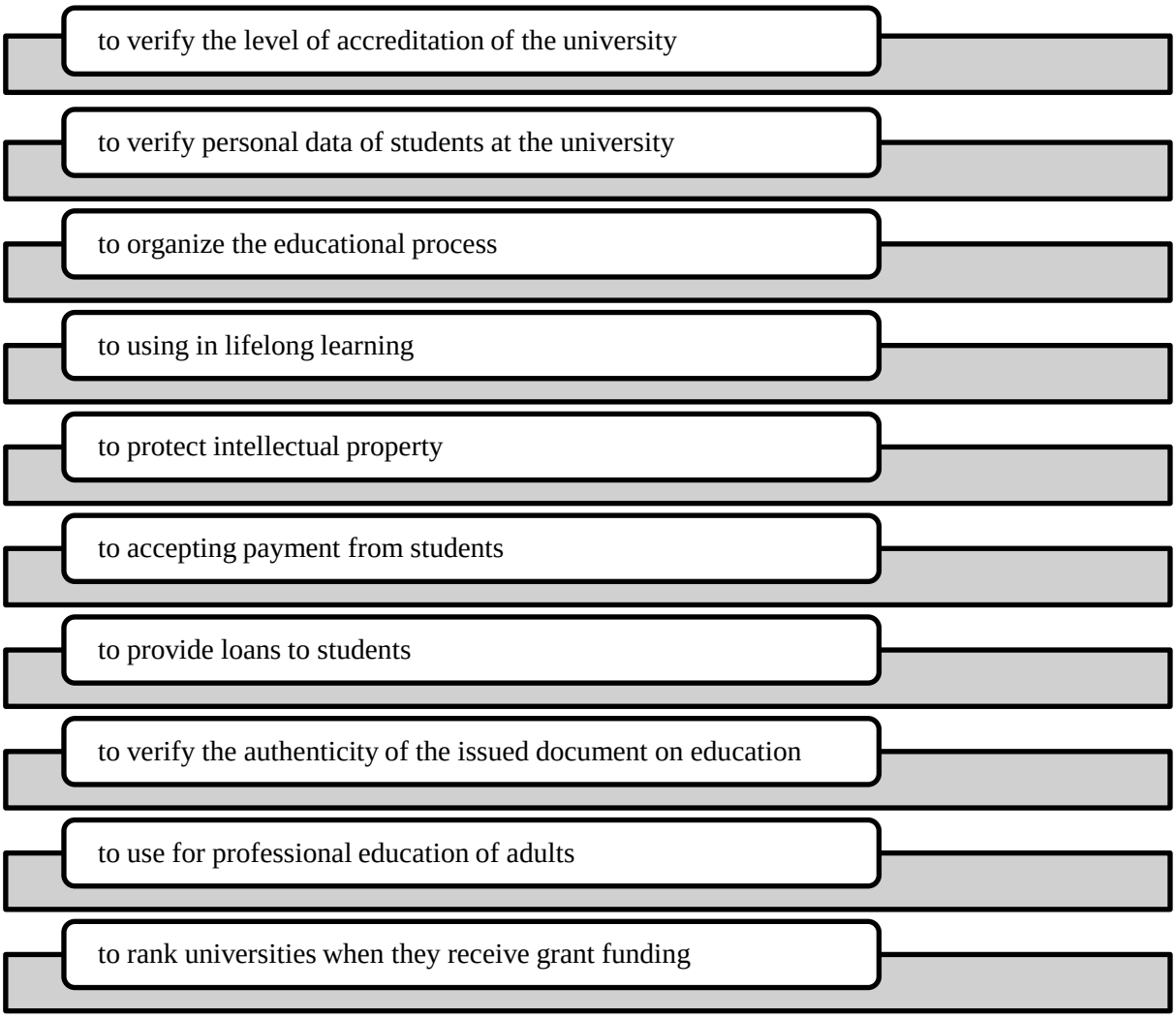


**Figure 1. The areas of blockchain technologies using in education**
*Source: developed by the author on the basis of [1-6]*

**3. Blockchain technologies using to organize the educational process.** Under this scenario, educational organizations that use the ECTS credit system to monitor the learning process will use Blockchain to enroll in individual disciplines (modules), thus supporting the international mobility of students.

**4. Blockchain technologies using for lifelong learning.** According to this direction, students will keep their certificates of training obtained from any source: formal or informal, and to instantly verify the authenticity of these documents will be used Blockchain technology. This will allow students to take an active part in various volunteer and other informal events, scientific conferences and professional seminars, participation in which can be credited as part of the training.

**5. Blockchain technologies using to protect intellectual property.** In accordance with this area, blockchain technologies can be used to identify authorship of scientific papers and prevent plagiarism in student work, graduate dissertations,

and in the works of teachers. It is blockchain technology that will be able to certify the date, place of publication, as well as authorship of it, as well as references to the document as a whole and its individual parts. To do this, a blockchain of publicly available publications and a record of the links they used will be created.

The same system can be used to track and reuse intellectual property created by an institution and to enforce copyright.

**6. Blockchain technologies using to accepting payments from students.** According to this direction, students will provide tuition fees through Blockchain cryptocurrency.

**7. Providing student funding through Blockchain in the form of vouchers (loans).** According to this direction, state (or sponsorship) tuition funding will be issued to students in the form of "vouchers" through Blockchain. Vouchers can be programmed to allocate tranches of funding to a student or educational organization based on certain performance criteria, such as grades or test results.

**8. Blockchain technologies using to verify the authenticity of the issued educational document.** In this case, universities that issue educational documents in paper form also issue a digital document (diploma / certificate), which will use the public Blockchain to store digital signatures related to digital certification. Uniquely signed digital documents are given immediately to consumers. Authentication of such a document requires only a comparison with a digital signature stored on Blockchain.

With the help of blockchain technology and general availability of information, it will be possible to track each diploma, to verify its authenticity.

**9. Blockchain technologies using for professional education of adults.** This area will involve the use of blockchain technologies for specific professions, whose representatives must continue their education throughout life (teachers, engineers, lawyers, attorneys, physicians, auditors and others). With the help of blockchain technologies you can confirm your practical experience and additional knowledge gained during scientific conferences and professional seminars, as required by the qualification requirements for the respective professions [5].

**10. Blockchain technologies using for ranking universities when they receive grant funding.** University rankings, the information for which will be verified from several open sources, will allow more efficient distribution of grant funding in accordance with university research [6].

**Discussion.** We believe that blockchain technologies in education should use only open sources of information, which will allow them to be used by all stakeholders. At the same time, it is necessary to comply with all the necessary rules for the protection of personal data provided by the laws of different countries. The combination of openness of information and protection of personal data is a major problem that currently faces the possibility of more active use of blockchain technology in education.

**Conclusions.** Thus, the possibility of using blockchain technologies in the management of educational institutions will bring them to a new level of functioning, which will improve the quality of the educational process and the level of knowledge of students.

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