

A STUDY OF THE NEW ROLE OF BLOCKCHAIN IN THE INDIAN EDUCATION SYSTEM

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Abstract:

Blockchain is the foundational technology that allows cryptocurrencies like bitcoin to exist. Blockchain technology has been used in numerous domains such as banking, justice, and commerce as part of the fourth industrial revolution since the invention of the steam engine, electricity, and computer technology. People's willingness to adopt technology has been influenced by rapid technological improvement. The traditional education system in developing nations has lately been improved through the implementation of distributed ledger technology.

Keywords: *Blockchain in Education, Disruptive Technology, E-Learning, Edtech*

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Introduction:

The global education sector has shifted from hardcopy learning materials and textbooks to online resources through the use of e-learning modules over the previous few decades. The considerable transformation in the education industry has been influenced by digitization. With a population growth rate of 1.5 percent, offering high-quality, advanced education is a difficulty in India. (Ramachandran, 2020) Due to the more efficient, transparent, and secure database solutions that blockchain technology provides, there is a growing awareness of blockchain solutions across India.

Background of the Study:

On Dec 2021, when Mr. Narendra Modi, Prime Minister of India at IIT Kanpur awarded the graduating IITians, the degrees based on Digital format of Blockchain, it unveiled a new revolution and facet of Blockchain technology in education industry. Benefits of Blockchain technology are often referred to cryptocurrency which enable Ethereum and Bitcoins trading at the crypto exchanges. During the Covid 19 Pandemic, digital technologies played a critical role

across the globe where colleges and universities must shift to online teaching modes in short span of time. Flipped classrooms and blended learning in education will continue even the students join, when the universities are opened.

Case Studies from Globe - On Line Teaching Learning Initiatives

BYJU'S – was founded in 2011 as an online tutoring and educational technology firm based at Bangalore and became the world's highly valued edutech company, The company has experienced a 200 percent growth in the number of students using its services free live classes on Think and Learn application.

In China about 75% of the users in 2020 used **Tencent classroom** – online education platform, when China's government ordered a quarter-billion full-time students to restart their studies via internet platforms.

Swayam (Study Webs of Active Learning for Young Aspiring Minds) Portal launched by Government of India in 2017 and created by MHRD and AICTE with the help of Microsoft. Online courses from class 9th to Post Graduation are taught online through video

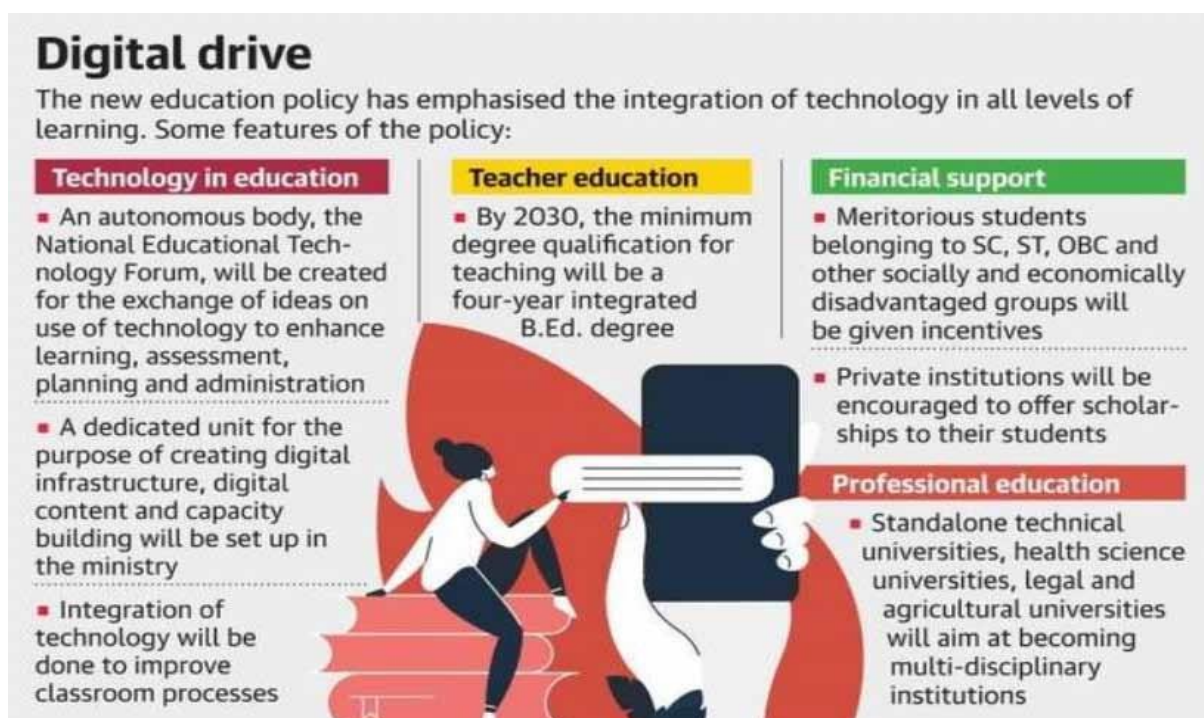
recorded lectures and written notes in different weekly modules.

To encourage equal use of technology, the New Education Policy in India (NEP) includes a new component on digital education.

Microsoft Teams (MS Teams) – Many higher education institutes used MS Teams for online teaching

as it provides various features of creating team or class of the students for online teaching, assignments, evaluations, downloading attendance, chat and uploading E content during the pandemic. Class recordings can be shared with the students and students can view their score of the assignment.

Figure 1. Digital drive – new education policy



Source: New Education Policy, 2020. MHRD, Government of India

educational applications. However, in a short span of time, in colleges across the world, various flexible and simple techniques of studying and teaching have been established. Hybrid learning approach, Four Quadrant E Learning approach – E tutorial, E Content, Online Group Discussions and Evaluation system were developed with the new emerging technologies like Block Chain, Artificial Intelligence, Big Data, IoT, and Robotics and to remove the technical and communication barriers. AI systems provide personalized learning for students, automating instructors, adoptive assessments and routine tasks.

Literature Review:

Al-Omari (2019). This study used the Technology Acceptance Model (TAM) to predict the approval of Blockchain Technology in Saudi Arabia. The validity and application of the TAM model in higher education to predict and explain students' behavioral intentions were investigated. External independent factors and hypotheses to confirm the study results on Behavioral Intention to Use (BI) were Perceived Usefulness (PU), Technology Anxiety (TA), Perceived Cost (PC), and Perceived Privacy (PP).

Alharbi & Sohaib (2021) To better understand why individuals are adopting cryptocurrencies, this essay

examines the technological components of optimism, innovation, discomfort, and insecurity. Researchers used (PLS-SEM) analysis to investigate the relationships between these characteristics and estimate bitcoin adoption with more accuracy.

Oliva et al., (2019). This study investigated the effective growth of cryptocurrency from the standpoint of customer behavior. Testing a model utilizing the Technology Acceptance theoretical framework explained 85 percent of the intention to adopt Cryptocurrencies. This study's findings have a variety of critical implications for the development of cryptocurrencies, including risk, financial literacy, facilitating conditions, social impact, effort expectancy, and performance expectancy.

Ullah et al., (2021). The findings indicated the key factors influencing educational institutions' decisions to adopt blockchain technology for e-learning. Compatibility has a considerable impact on the implementation of blockchain in smart learning settings, according to the results of the online poll. The findings help us grasp a larger Technology Acceptance Model for blockchain adoption in educational institutions.

Steu, M.-F. (2020). The advantages and disadvantages of using blockchain technology in education are discussed in this article. A case-based and research-based methodology are both used in the study.

As part of the first method, interviews and research were conducted with commercial and public higher education institutions that use blockchain technology. As part of the second strategy, this study included abstracts of research papers written by educators, lawyers, and technologists. education experience.

Nayak (2021). The article talked about the use of Blockchain by Central Board of Secondary Education, India. He also explained that Universities and colleges

need to look beyond classrooms by replacing them with digital platforms through blockchain smart contract concept.

Conceptual Framework:

Blockchain is being used in a variety of fields, in addition to its original and traditional usage. Blockchain first professional implementation was Bitcoin in 2009, and following Bitcoin's widespread acceptance, technology from a variety of disciplines is attempting to apply blockchain professionally. One of the most well-known Blockchain applications is in the field of education.

Objectives of the Study:

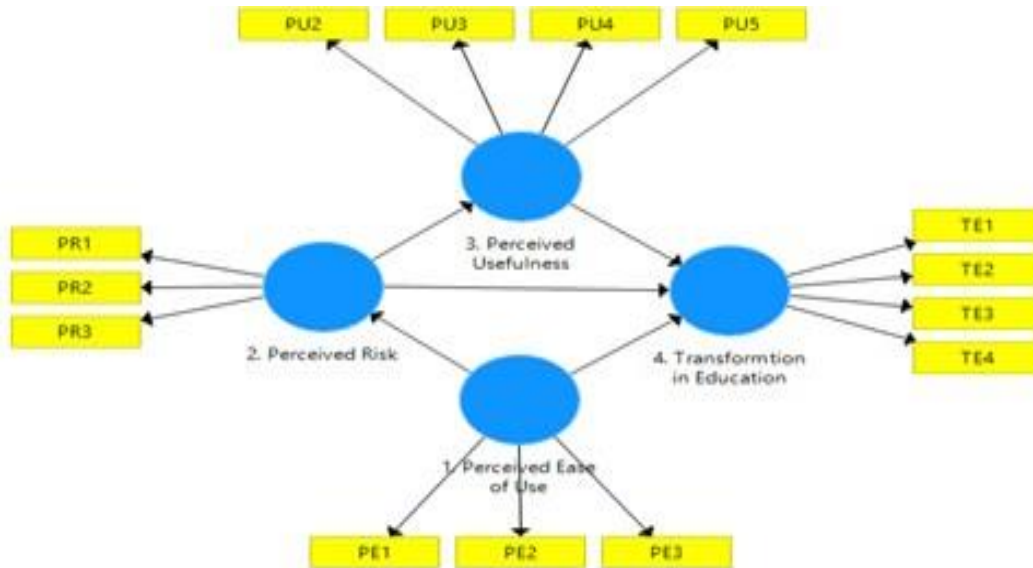
1. To study the impact of perceived usefulness, perceived ease of use, and perceived risk in adoption of blockchain in education on Transformation in Education.
2. To investigate the numerous factors that influence the adoption of blockchain technology in the teaching sector.
3. To study the association of independent factors perceived ease of use & perceived usefulness in adoption of Blockchain in the presence of Perceived Risk.

Research Hypothesis:

The Hypothesis framed for the study is as under:

- H1 Perceived Ease of Use in adoption of Blockchain in education sector has no significant impact on the Perceived Risk
- H2 Perceived Ease of Use in adoption of blockchain in education sector has no significant impact on Transformation in Education.
- H3 Perceived Risk of adoption in blockchain in education sector has no significant impact on the Perceived Usefulness.
- H4 Perceived Risk in adoption of blockchain in education sector has no significant impact on the Transformation in Education.

H5 Perceived Usefulness in adoption of blockchain in education sector has no significant impact on the Transformation in Education.



Source: Authors' Original Work using SmartPLS

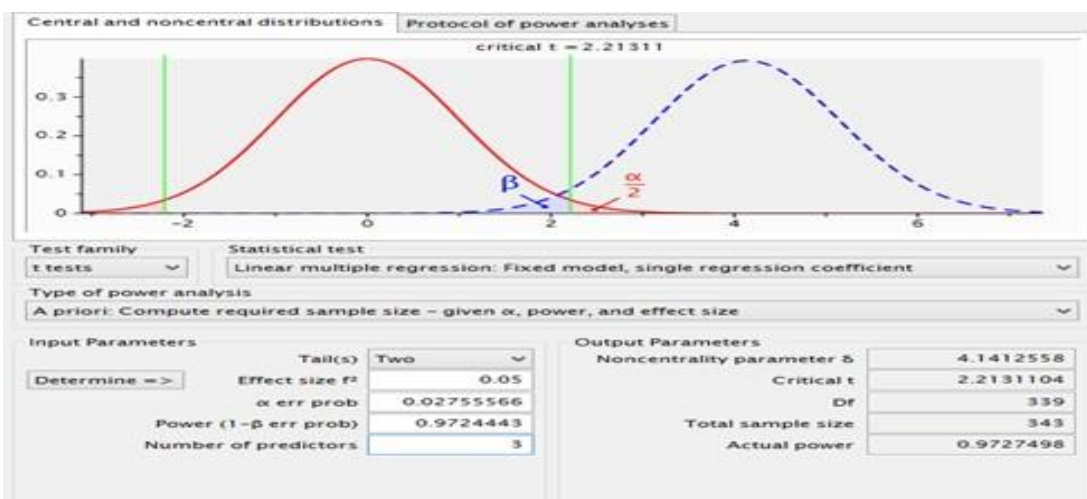
Figure 1. Conceptual framework

Research Methodology:

The primary data was collected in the form of a survey using a Google form. The software G*Power 3.1.9.2 was used to investigate the appropriate sample size on the basis of test family t-test and Statistical Test, Linear Multiple Regression. The software calculated a sample size of 343. As largersample sizes allow researchers to better determine the average values of their data, even though a sample size of 343 was deemed adequate, 385 valid replies were evaluated for the study. The respondents came from all around India. The programme utilized to determine the structural equation model wasSmartPLS SEM. The Research Hypothesis was tested in the same way.

Data Analysis And Interpretation:

Primary Data:



Source: Authors Original Work using G* Power Analysis

Table 1.

Constructs	Codes	Questions
Perceived Ease of use	PE1	<i>The disruptive technology is easy to use at your university</i>
	PE2	<i>Blockchain is feasible to do multitask on same time</i>
	PE3	<i>The smart contract based distributed ledger system is speedy than traditional education system</i>
Perceived risk	PR1	<i>Using Blockchain in education is risky</i>
	PR2	<i>There is too much uncertainty associated with the use of block chain in education</i>
	PR3	<i>Compared with current / Traditional methods, use of blockchain in education is riskier</i>
Perceived Usefulness	PU2	<i>Blockchain can aid your educational institutes for fast learning.</i>
	PU3	<i>Blockchain can better transparency for Higher education system.</i>
	PU4	<i>Blockchain can aid for mutual learning at your college / university.</i>
	PU5	<i>Helps in virtual education to save time of students especially in pandemic situation like COVID-19</i>
Transforming education	TE1	<i>Enhancing and motivating lifelong learning</i>
	TE2	<i>Empowerment for learners (self-sovereignty)</i>
	TE3	<i>Efficiency enhancement for educational institutions</i>
	TE4	<i>Trust and transparency integration</i>

Interpretation:

Measurement Model:

The constructs' reliability and validity were assessed using Confirmatory Composite Analysis. In this study, Cronbach's Alpha, Composite Reliability, and Rho A with a value of 0.7 were used. Cronbach's Alpha (Nunnally, 1978), Composite Reliability (Hair et al., 2010), and Rho A (Henseler, 2015) values greater than 0.7 (Morgan, Leech, Gloeckner, and Barret, 2004) for all three components showing that the questionnaire was reliable based on this model. Cronbach's alpha is an internal consistency metric that expresses how closely a group of items are linked. The average variance extracted (AVE) is a convergent validity metric that assesses a latent concept's ability to account for the variation of its indicators

Conclusions and Implications:

- 1) To study the impact of perceived usefulness, perceived ease of use, and perceived risk in adoption of blockchain in education on Transformation in Education. According to the study Perceived Ease of Use, Perceived Risk, and Perceived Usefulness in the adoption of Block chain, will have an impact on the transformation in education.
- 2) To investigate the numerous factors that influence the adoption of blockchain technology in the teaching sector: According to the study the following factors influence the adoption of Blockchain:
 - Strong Legislative Framework-It's hard to predict if blockchain will have a significant and long-term impact on education. There is a growing awareness of blockchain solutions across India due to the more efficient, transparent, and secure

database solutions that blockchain technology provides.

- Blockchain Technology should not be viewed as Threat: Block chain should not be viewed as a threat to educational institutions or as a replacement for them, but as an innovative technology that can add value to a variety of educational processes, such as making learning more engaging and effective, lowering costs, increasing trust, and providing enhanced security.

Limitations and Further Study:

This research still has certain limitations. The concept of blockchain technology is still very new. There is a lack of knowledge regarding how blockchain can be used in education. This study's sample size is restricted to educational institutions (knowledge providers) and students (knowledge recipients). Suppliers of blockchain-in-education solutions (e.g., start-ups) should be considered in the future to better understand the suggested paradigm. Second, blockchain is a technology that is not self-contained. In this study, we did not look into the integration of blockchain with other technologies. For a deeper understanding, blockchain could be used with big data, artificial intelligence, and the internet of things in the future.

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