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Review Article

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Cryptocurrency Mining Adoption and Its Impact on Students Academic Performance: Evidence from Adamawa State Tertiary Institutions in Nigeria

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ABSTRACT: ***This study investigates the impact of cryptocurrency mining on students' academic performance, exploring the perspectives of both lecturers and students. the survey reveals a predominantly positive outlook on cryptocurrency's role in academia. Notably, 40% of lecturers believe cryptocurrency positively impacts student performance, while 54% acknowledge its benefits in understanding complex computing concepts. A significant 62% of lecturers agree that mining activities enhance overall academic performance. Students demonstrate strong interest in financial innovation, with 67% expressing career aspirations in cryptocurrency or blockchain. Simple percentage and google Sheet were used for data analysis and presentation of the results respectively, these findings suggest that hands-on exposure to cryptocurrency mining can have practical educational benefits, inspiring future-oriented thinking among students. the research contributes to the growing body of evidence supporting the integration of cryptocurrency and blockchain education in academic curricula.***

KEYWORDS: Mining, Blockchain, Cryptocurrency, Academics, Decentralized Finance (DeFi).

INTRODUCTION

Currency is a critical factor in the economy which helps to conduct reliable agreements between citizens around the world. The Central Bank of Nigeria has the sole right and authority to issue currency in Nigeria as stipulated in the Monetary Act (2007) So, people use money issued by the central bank to do their transactions. But the emergence of internet technologies greatly impacts on consumer's daily activities. Adoption and implementation of Internet, social networks, mobile and electronic payments, blockchain technology and digital currencies are a driving force and strategic asset for many organizations. Therefore, today many people move towards online platforms to accomplish their daily activities with technology innovations.

Cryptocurrency refers to tokens or digital currency based on cryptographic technology used to perform a range of financial transactions such as payments or store of value on the blockchain technology. Several names for this context can be identified such as Cryptocurrencies, Digital Currencies and Virtual Currencies which represent the same meaning. However, the common name used in the academic literature is cryptocurrency. The first commercial transaction with

the first cryptocurrency in 2010 marked the start of a revolution in transactions (Oliva, *et al*., 2019). Cryptocurrencies, such as Bitcoin, Etherium, Litecoin, Ripple and hundreds of others, have emerged as an alternative form of money (Nuryyev, *et al*., 2018). These digital currencies corroborated by blockchain technology, have interlocked with various aspects of our lives as well as our daily transactions. However, their impact extends beyond the financial realm. Cryptocurrency, while offering opportunities for financial growth, also carries risks that can lead to negative effects on individuals among which include:

i. Time Distraction: The 24×7 nature of cryptocurrency trading can be addictive, diverting students' attention from studies to monitoring markets and executing trades.

ii. Financial stress and Risk: Students may Experience anxiety due to market volatility, especially if they invest money, they cannot afford to lose. This stress can negatively impact their focus and academic performance.

iii. Illegal or Risky Activities: Misuse of cryptocurrency for scams, gambling, or illegal purchases can lead to legal and academic consequences, damaging a student's career.

iv. Overreliance on speculation: Students who prioritize short-time trading profits over academic goals may lose sight of long-term career aspirations, leading to underperformance in their studies.

Statement of Problem

The influence of cryptocurrency on students' study habits is multifaceted. While there are clear benefits in terms of technological skills and enhanced financial literacy. The potential for distraction, financial stress, gambling like behavior poses significant challenges. This knowledge gap presents a challenge because the growing prevalence of cryptocurrencies may have detrimental effects on students' academic performance and cognitive development.

Objectives of the Study

i. To analyze the impact of cryptocurrency on students' academic performance.

ii. To examine whether exposure to cryptocurrency concepts fosters innovation and entrepreneurial tendencies among students.

iii. To investigate whether students have career choice in crypto currency or blockchain industry.

Significance of The Study

This research is a step towards understanding how we can integrate digital finance into education in a way that it does not negatively affect but promote beneficial learning outcomes. Parents, educators, and policymakers can all benefit from the study's insightful conclusions. Understanding how digital finance and education interact allows us to traverse the field more skillfully and safely, optimize the advantages for students, and reduce any hazards.

Scope and Limitation of the Study

This research is focused on the impact of cryptocurrency on academic performance of students in Nigeria.

Definition of Terms

i. Cryptocurrency: This is a digital or virtual form of currency that uses cryptography for security and operates on a decentralized ledger known as blockchain.

ii. Blockchain: A distributed ledger technology that records transactions across multiple computers in a way that is transparent, secure, and resistant to tampering.

iii. Notcoin: A specific cryptocurrency introduced as a play-to-earn game integrated within the Telegram messaging platform.

iv. Tapswap: This is another cryptocurrency mentioned in the study. According to users, Tapswap offers a platform for users to exchange digital assets and participate in Decentralized Finance (DeFi) activities such as liquidity provision, yield farming, and trading on Automated Market Makers (AMMs).

v. Hamster Kombat: Yet another cryptocurrency mentioned, Hamster Kombat is a Telegram based game where players tap on a virtual hamster to mine cryptocurrency, which can potentially be withdrawn to their personal wallets.

vi. Cryptocurrency Mining: The process of validating and recording transactions on a blockchain network. Miners use computational power to secure the network and are rewarded with newly minted cryptocurrency coins for their efforts.

vii. Cryptocurrency Trading: This can simply be understood as the buying, selling, and exchanging of cryptocurrencies on various digital exchanges.

viii. Cryptocurrency Investment: The act of purchasing and holding cryptocurrencies with the expectation of generating a return on investment over time.

ix. Blockchain Technology: This is a decentralized and distributed ledger that records transactions in a secure and transparent manner. It has applications beyond finance, including supply chain management, healthcare, and voting systems.

x. Decentralized Finance (DeFi): An ecosystem of financial applications and services built on blockchain networks, aiming to provide open, permissionless, and interoperable alternatives to traditional financial systems.

xi. Digital Finance: The broad category encompassing financial services, products, and technologies delivered through digital channels, including cryptocurrencies, mobile banking, online payments, and digital wallets.

LITERATURE REVIEW

The rise of cryptocurrency has generated significant interest among various demographics, particularly students. This literature review explores the emerging relationship between cryptocurrency involvement and academic performance among students, drawing on recent studies and scholarly discussions.

Origin of Cryptocurrency

The concept of cryptocurrency began long before the famous Bitcoin whitepaper was published by Satoshi Nakamoto in 2008. The roots of cryptocurrency can be traced back to the early 1980s with the work of David Chaum, an American cryptographer. Chaum introduced the idea of digital cash in his 1982 paper titled "Computer Systems Established, Maintained, and Trusted by Mutually Suspicious Groups." This paper laid the foundation for the development of blockchain technology and cryptocurrencies. Chaum went on to create "eCash," an early form of digital currency, through his company DigiCash in the 1990s. Although eCash did not achieve long-term success, it inspired further developments in digital currencies. Other early attempts at creating digital cash included "Bit Gold" and "b-money," but none of these projects

reached fruition. However, they set the stage for the creation of Bitcoin, which would become the first decentralized cryptocurrency. Bitcoin was introduced to the world in 2009, amidst the global financial crisis. Nakamoto's whitepaper, "Bitcoin: A Peer-to-Peer Electronic Cash System," proposed a system that did not rely on a central authority and introduced the proof-of-work consensus mechanism to validate transactions. This innovation allowed for a decentralized and secure digital currency system, which is now known as blockchain.

Cryptocurrency Awareness and Adoption Among Students

Several studies indicate that university students are increasingly aware of and engaged with cryptocurrencies. According to Balakrishnan and Shalini (2021), students in higher education show a growing interest in digital assets, often motivated by the potential for financial independence and technological curiosity. This interest is further facilitated by the accessibility of trading platforms and the abundance of information on social media and YouTube, making cryptocurrency a prominent part of youth financial behavior.

The Impact of Cryptocurrencies on Learners' Behavior

Cryptocurrency has continued to have a place in recent studies as researchers tend to extensively research on its relationship with the behavior of learners, especially among younger populations. Some previous studies have identified behavioral patterns associated with cryptocurrency usage, and an instance is in the research by Smith *et al*. (2021) which found that the volatility and speculative nature of cryptocurrencies can lead to addictive behaviors and impulsive decision-making, similar to gambling. This goes in line with findings by McKinney (2020), who noted that users, especially younger individuals, often experience heightened anxiety and stress due to the unpredictable market fluctuations of digital currencies. Zhang and Fung (2022) explored how the integration of cryptocurrencies in daily transactions influences users' financial habits. The study revealed that while some users developed a deeper understanding of financial systems and improved their financial literacy, others faced negative consequences such as financial instability and increased risk-taking behaviors. Furthermore, a study by Hernandez and Lee (2023), similar to the words of Smith *et al*. (2021), highlighted that the volatility of cryptocurrencies like Tapswap and Hamster Kombat can contribute to significant stress and anxiety among users. The unpredictable nature of these digital assets often leads to compulsive monitoring and trading behaviors, which can be particularly disruptive for students who need to maintain focus on their academic responsibilities. These studies suggest a dual-edged impact of cryptocurrencies on behavior, highlighting both educational benefits and potential psychological detriments.

Relationship between Psychological Factors and Academic Performance

The relationship between psychological well-being and academic performance continues to be a critical area of research. Numerous studies have shown that mental health significantly influences students' academic performance. For instance, a meta-analysis by Richardson *et al*. (2017) found a strong correlation between anxiety, depression, and reduced academic performance. In essence, stress and poor mental health can lead to difficulties in concentration, memory, and overall cognitive function, which are critical for success in academics. Page | 7 Kember and Leung (2021) stated that students who experience high levels of stress and anxiety tend to have lower academic motivation and performance. These psychological challenges can stem from various sources, including academic pressures, social issues, and increasingly, digital distractions. The rise of digital technologies and online platforms has introduced new stressors, such as cyberbullying, social media addiction, and, as this study aims to explore, the influence of digital finance like cryptocurrencies. Thompson and Green (2023) revealed that the mental health challenges faced by students, including those induced by financial

uncertainties related to cryptocurrency investments, can lead to decreased academic motivation and performance. The study emphasized the importance of mental health support services in educational institutions to help mitigate these effects. Moreover, a more recent finding by Patel *et al*. (2024) indicates that high levels of stress and anxiety, often exacerbated by digital distractions like cryptocurrencies, can significantly impair cognitive functions such as memory, attention, and problem-solving skills. This, in turn, leads to poorer academic outcomes.

Academic Distraction and Time Allocation

One key concern is the time students devote to cryptocurrency trading or mining activities. Obeidat *et al*. (2022) observed that students who actively participate in trading tend to spend substantial hours monitoring market fluctuations, which may encroach on study time. This time diversion has been linked to reduced academic focus, leading to potential declines in academic performance.

Similarly, Alzahrani and Daim (2019) noted that the volatility of crypto markets may increase stress and cognitive load among student investors, potentially affecting their concentration and time management, which are critical to academic success.

Technological Literacy and Learning Outcomes

Conversely, some studies present a more optimistic view, highlighting that involvement in cryptocurrency can improve technological literacy. Kim and Kim (2020) argued that students learning blockchain technology or engaging in crypto-related projects may experience enhanced critical thinking and problem-solving skills, positively influencing academic performance, especially in STEM disciplines.

METHODOLOGY

Research Design

A mixed-methods approach is adopted in this research, combining both quantitative and qualitative research designs. This will allow for comprehensive analysis of the relationship between cryptocurrency impact and exposure, and, students' innovation/entrepreneurial tendencies. Data will be collected using questionnaire from four tertiary institutions in Adamawa state namely Adamawa state university, federal polytechnic Mubi, Adamawa state polytechnic and federal college of education yola, Adamawa state. data will be analyzed using simple percentage and google sheet will be used to present the results obtained from the research.

i. Quantitative Component: To statistically assess correlations or causations between exposure to cryptocurrency and measurable indicators of innovation and entrepreneurship.

ii. Qualitative Component: To explore students' personal experiences, insights, and attitudes in more depth.

Data Collection Methods

Survey Questionnaire and Semi-Structured Interviews or Focus Groups will be used for both quantitative and qualitative data respectively.

RESULTS

The figures display below show results of the data analyses obtained from the questionnaires that was administered to the lecturers and students from four different tertiary institutions in Adamawa state, Nigeria.

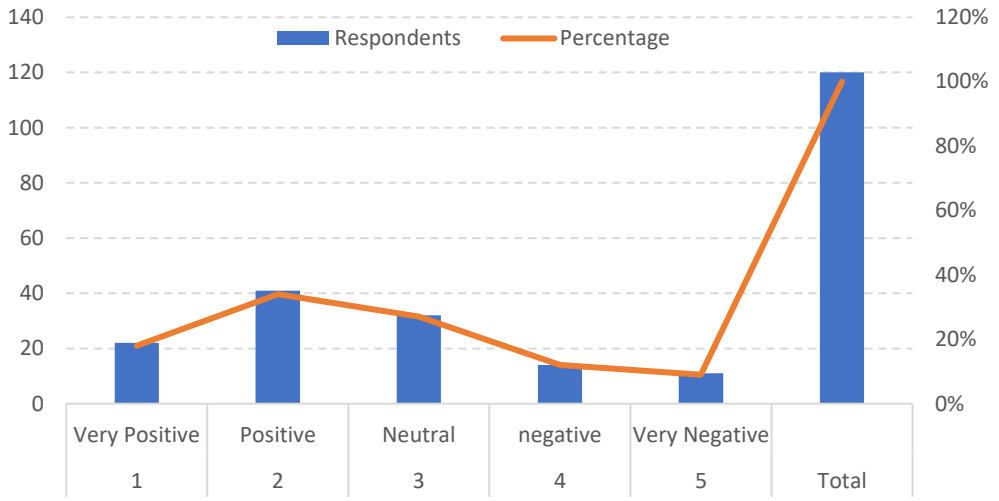

Figure 1: Shows the impact of cryptocurrency mining activities on students' performance.

The survey findings in Figure 1 reveals that lecturers hold strong views about the impact of cryptocurrency on their academic performance. Among the 120 respondents, the majority (34%) rated the impact as positive, while an additional 9% viewed it as very negative, indicating that over 40% of lecturers perceive cryptocurrency as having a positive effect. Meanwhile, 27% of students reported a neutral stance, suggesting uncertainty or indifference. Only 30% of respondents expressed a positive or very positive view, with 18% finding it very beneficial and 12% somewhat detrimental. These results suggest that while a Prevailing lecturers recognize potential advantages, a portion leans sentiment toward concern, possibly due to distractions, resource misuse, or a lack of academic relevance associated with cryptocurrency activities.

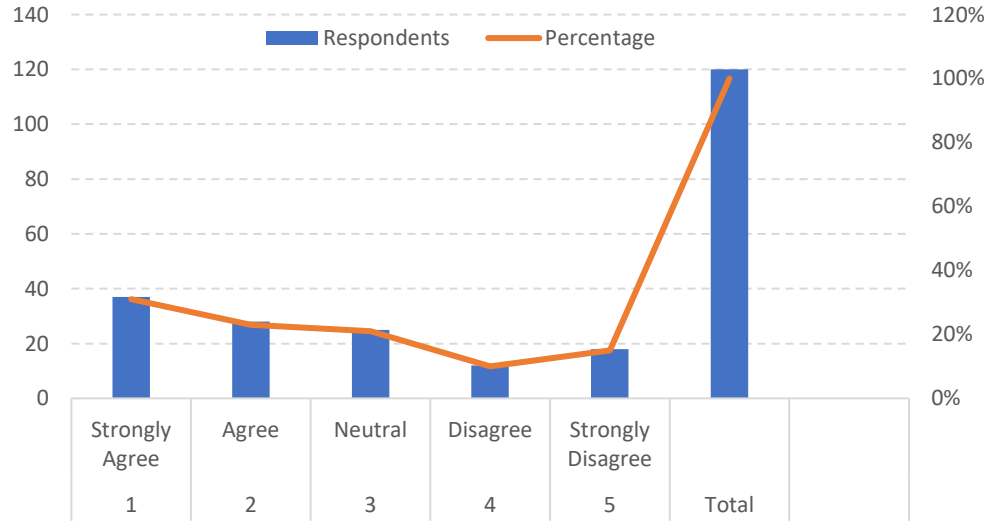

Figure 2: Shows students understanding of complex computing concepts as a results of crypto mining activities.

The survey results from Figure 2 indicates that a majority of lecturers believe that students' understanding of complex computing concepts has improved as a result of crypto mining activities. Specifically, 31% strongly agree and 23% agree, totaling 54% in agreement. Meanwhile, 21% remain neutral, and a smaller portion express doubt, with 10% disagreeing

and 15% strongly disagreeing. This shows a generally positive perception among lecturers, though a notable minority remain unconvinced or undecided.

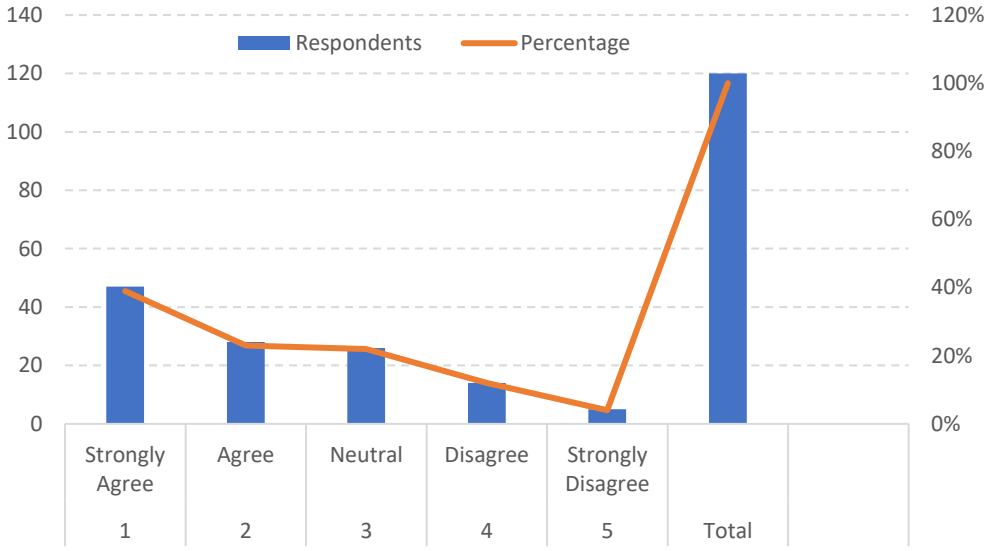

Figure 3: Shows positive impact of mining activities on students overall academic performance

This survey results in Figure 3 indicates that the majority of respondents (62%) perceive that mining activities have a positive impact on students' overall academic performance, with 39% strongly agreeing and 23% agreeing. Meanwhile, 22% remain neutral, and a smaller portion of the lecturers disagree (12%) or strongly disagree (4%), indicating that negative perceptions are minimal.

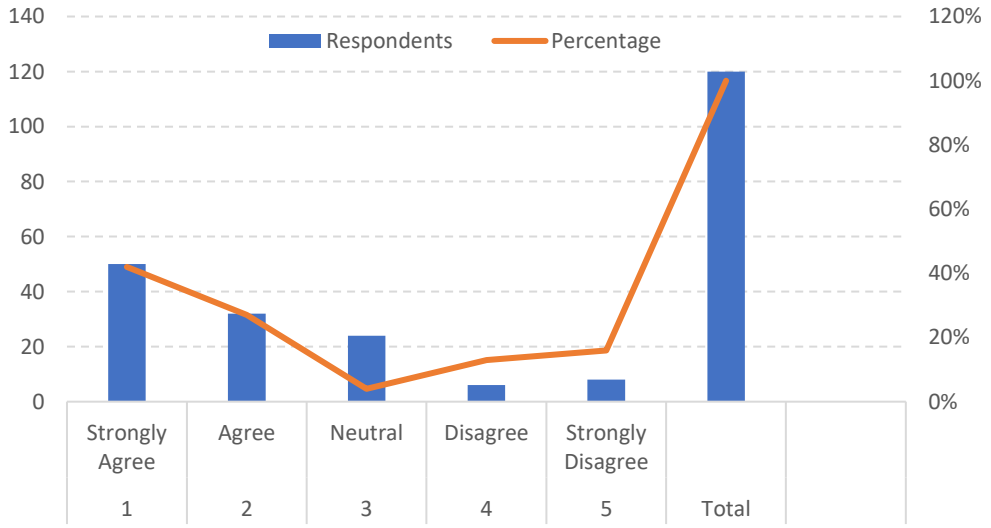

Figure 4: Shows students' attitude towards financial innovation following crypto currency mining education

The survey results in Figure 4 reveals a predominantly positive attitude among students towards financial innovation. 42% strongly agree and 27% agree that financial innovation is beneficial. a combined 69% expressing support. Only 4% of respondents remain neutral, showing minimal indecision. On the other hand, 13% disagree and 16% strongly disagree, totaling 29% who hold a negative view.

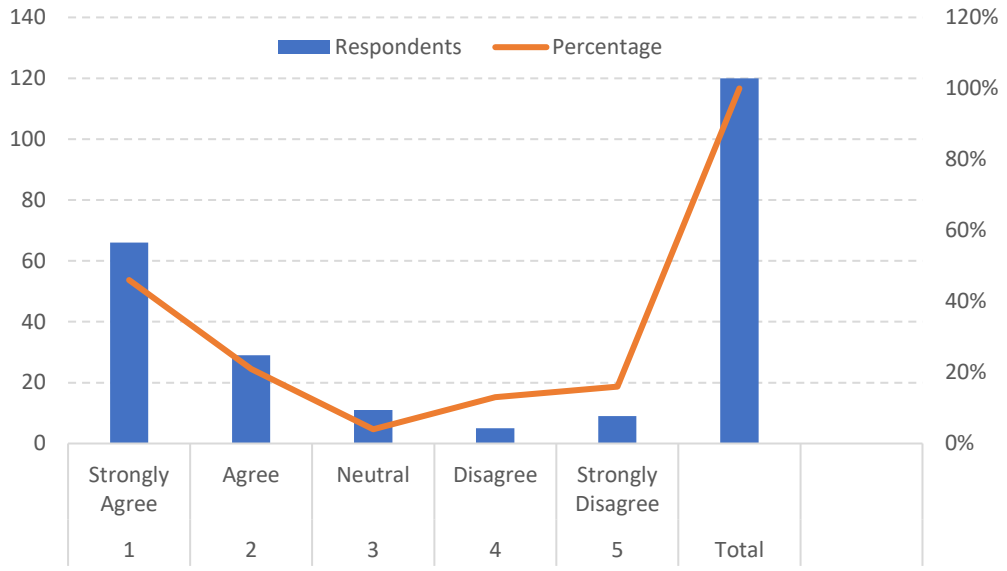

Figure 5: Shows the career choice in crypto currency or blockchain industry among students after being exposed to cryptocurrency mining.

The results in Figure 5 shows a clear inclination among students towards pursuing a career in the cryptocurrency or blockchain industry after being introduced to cryptocurrency mining. 46% strongly agree and 21% agree, a combined 67% are open to a career in this field. 4% remain neutral, suggesting limited indecision or lack of clarity. Meanwhile, 13% disagree and 16% strongly disagree, making up 29% who are not inclined towards such a career path.

DISCUSSION

The survey results reveal a generally positive outlook on cryptocurrency's role in academic setting. Over 40% of lecturers see cryptocurrency as having a positive impact on student performance. More than 54% believe that crypto mining helps students understand complex computing concepts. While some concerns remain particularly around distraction or academic relevance, most educators recognize its educational value. A strong 62% of lecturers agree that mining activities improve overall academic performance, with only a small minority disagreeing. This suggests a growing belief in the practical benefits of hands-on crypto exposure. Students show overwhelming support for financial innovation, most notably, 67% of the students expressed interest in pursuing a career in cryptocurrency or blockchain, indicating a clear shift toward future-oriented thinking inspired by their exposure to the field.

CONCLUSION

This study explored the multifaceted relationship between cryptocurrency mining and students' academic performance in tertiary institutions in Adamawa State, Nigeria. Findings revealed a predominantly positive perception among both lecturers and students regarding the educational value of cryptocurrency activities. A significant proportion of lecturers recognized that mining fosters a better understanding of complex computing concepts and can enhance academic performance. Likewise, students showed strong interest in financial innovation and expressed considerable enthusiasm for future careers in the blockchain and cryptocurrency sectors. However, while the educational and entrepreneurial benefits of cryptocurrency exposure are clear, the study also highlighted potential challenges. These include time mismanagement, financial stress, and possible involvement in risky or unregulated activities. These issues necessitate a balanced and guided approach to integrating cryptocurrency into students' academic and personal development. In conclusion, cryptocurrency mining—when properly

monitored and aligned with academic goals—can serve as a powerful educational tool. It has the potential to enhance digital literacy, encourage innovation, and inspire future career pathways among students. Educational institutions and policymakers should consider structured programs and support mechanisms that maximize these benefits while mitigating associated risks. Future research should focus on evaluating how well specific intervention strategies can reduce the negative effects of cryptocurrency use among students. Implementing targeted approaches such as mindfulness training, stress reduction techniques, or financial literacy education could significantly lessen the harmful outcomes identified in this study.

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