



Assessing the Influence of Crypto-Coins Mining Among Students in Nigerian Tertiary Institutions

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ABSTRACT

The mining of cryptocurrencies has gained considerable attention among Nigeria's youth in recent times, especially from students attending secondary and tertiary schools throughout the country. Students are frequently observed using their phones to mine cryptocurrencies in class, taking their focus away from what they are learning. Teachers and lecturers are finding it harder and harder to engage students who are engrossed in utilizing various applications on their phones to mine virtual currency, which is a concerning trend for them. This distraction is impairing the learning and academic growth environment that should be the focus of the classroom. This paper seeks to determine how much mining and cryptocurrency activities impact students' capacity to continue engaging in fruitful academic activities. 438 survey participants completed the online questionnaires who are students from various Tertiary Institutions in Katsina State, Nigeria. The research team created a survey with eighteen questions that utilize several scales. SPSS 22, NVivo 14.23.0, and Microsoft Excel 2010 were used for quantitative and qualitative analysis. According to the study's findings, which are in line with some previous research, using cryptocurrencies mining apps has a detrimental effect on students' academic performance. The study also made clear how vital it is to address the detrimental effects of crypto coins mining on students' academic performance. Educational institutions and legislators can better assist students in comprehending digital finance and education if awareness is increased, support services are offered, and focused interventions are put in place.

Keywords: Crypto-Coins, Mining, Nigeria, Students and Tertiary Institution.

1.0 INTRODUCTION

Cryptocurrency mining is the process of validating transactions on a blockchain and adding them to the public ledger. One of the most amazing developments in modern technology is cryptocurrency, whose rise has drawn a lot of attention recently from both investors and the media. Cryptocurrency is a type of digital currency that protects financial transactions through blockchain technology and encryption. Although it has not yet gained widespread acceptance, financial innovation—like cryptocurrencies—has the potential to fundamentally alter the course of the global financial sector. By May 2023, the cryptocurrency market had grown to a stunning \$1.11 trillion in total capitalization (Bublyk et al., 2023).

The financial landscape has fundamentally changed as a result of the emergence of cryptocurrencies, like Bitcoin (BTC), BNB (BNB), Dogecoin (DOGE), Ethereum (ETH), Shiba Inu (SHIB), Solana (SOL), Tether USDt (USDT), Toncoin (TON), TRON (TRX), USDC (USDC), XRP (XRP), Notcoin (NOT) etc , In the recent time precisely April to October 2024, mining of coins such as Tapswap, Hamster, Dotcoin, Yescoin, Wormfare Slap, Topcoin, MemeFi Coin, PocketFi, Fuel, Athene, Eagle Mining, Dogs Coin, Cats Coin, X-Empire, W-Coin, AVACOIN, SEED, Tomarket (Tomato), Major, Rockey Rabbit, Catizen, Gamee, CEX.IO Power Tap, Blum, Fintopio, Gemz, HOT Wallet and many others have become so extensive among the youths. These have completely changed the financial industry by providing a new method of storing value and carrying out transactions across numerous platforms and gateways (Stepanova et al., 2024).

Aspects of our daily lives and transactions have become intertwined with these digital currencies, validated by blockchain technology. Yet, they have an effect that goes beyond money. Cryptocurrency has hazards that could have a detrimental impact on people, even though it presents potential for financial growth. Some instances of the detrimental effects people have experienced are as follows (Tayebi & Amini, 2024):

(1) Like gambling, cryptocurrency mining can become compulsive, causing some students to make reckless trades and closely monitor prices. Both extreme mental suffering and financial devastation may arise from this. (2)

The constantly shifting nature of cryptocurrency mining has resulted in severe financial losses for a number of students. Students who made significant cryptocurrency mining and investments, for instance, have seen their investments' value drastically decrease during sharp market declines, sometimes even losing their whole life savings. (3) People have lost money as a result of phishing operations, fraudulent ventures, and compromised exchanges in the bitcoin field. (4) An individual's mental health may be impacted by the stress of mining and the fear of missing out (FOMO), which can result in anxiety, sadness, and other mental health problems. (5) Due to its energy-intensive nature, cryptocurrency mining has sparked worries about its effects on the environment, potentially harming nearby populations and accelerating climate change (Alvarez, 2018; Kang, 2019).

Fewer researches have been conducted on cryptocurrencies despite their popularity and expansion, particularly in developing nations like Nigeria. Thus, the purpose of this study is to assessing the influence of Crypto-Coins mining among students in Nigerian Tertiary Institutions(Ghasemi & Farahani, 2024).

2.0 LITERATURE REVIEW

The idea behind cryptocurrencies predates Satoshi Nakamoto's 2008 publication of the well-known Bitcoin whitepaper. The origins of cryptocurrency can be found in the work of American cryptographer David Chaum in the early 1980s. In his 1982 paper "Computer Systems Established, Maintained, and Trusted by Mutually Suspicious Groups," Chaum first proposed the concept of digital currency. The creation of cryptocurrencies and blockchain technology was made possible by this study (Morosan et al., 2023).

Cryptocurrency is a type of electronic money that was developed to take the place of coins and paper money. Cryptocurrency can be used by anyone with an Internet-connected device. Traditional electronic money and cryptocurrency are the two main types of cryptocurrencies, respectively. Cryptocurrency is a decentralized medium of exchange, yet electronic money is governed by law and issued by the central bank (Alvarez, 2018).

In the 1990s, Chaum founded DigiCash, which produced "eCash," an early type of digital currency. Despite its short-term failure, eCash served as an inspiration for subsequent advancements in digital currency. "Bit Gold" and "b-money" were two other early attempts to create digital currency, however none of these initiatives succeed. They did, however, pave the way for the development of Bitcoin, the first decentralized cryptocurrency (Morosan et al., 2023).

In 2009, during the height of the global financial crisis, Bitcoin was first made public. In his whitepaper "Bitcoin: A Peer-to-Peer Electronic Cash System," Nakamoto presented a decentralized system that used the proof-of-work consensus method to verify transactions. This invention made it possible for a safe and decentralized digital currency system—now referred to as blockchain(Chohan, 2018).

2.1 The way cryptocurrency works

The creation of blockchains has made it possible for cryptocurrency to function. According to (Brown et al., 2023), blockchains are built to be intrinsically resistant to data alteration. A peer-to-peer network is used to distribute cryptocurrencies without the need to go through any middlemen. RBA explanations state that after a cryptocurrency transaction takes place, it will be combined with other transactions to form a block. This new block's data will be converted into cryptographic code. Miners will then attempt to crack the code. The block is added to the blockchain and the previous transaction is validated once the problem has been resolved. A person has a coin code and a private cryptographic key if they own any cryptocurrency (Jadhav et al., 2023; Kumari et al., 2024).

2.2 Cryptocurrency Mining

Cryptocurrency Coins Mining is the process of verifying and documenting transactions on a blockchain network. Miners employ processing power to protect the network and receive freshly created cryptocurrency coins in exchange for their work. Between 2019 and 2021, cryptocurrency mining gained so much popularity among cryptocurrency enthusiasts that the need for GPUs (graphics processing units) increased severalfold. Many cryptocurrency aficionados aspired to establish their own mining farm back then (Jadhav et al., 2023).

The majority of people just consider crypto mining to be a method of producing new currency. However, crypto mining also entails adding bitcoin transactions to a distributed ledger and verifying them on a blockchain network. Above all, crypto mining keeps digital currency from being spent twice on a dispersed network.

Bitcoin's distributed ledger only permits verified miners to update transactions on the digital ledger, which means miners have the additional responsibility of protecting the network from double-spending. This is because, similar to physical currencies, when one member spends cryptocurrency, the digital ledger must be updated by debiting one account and crediting the other. However, the problem with digital currencies is that digital platforms are easily manipulated (Eisenhardt & Eisenhardt, 2023; Kurup & Jeba, 2024).

2.3 Types of Mining

- i. **Proof of Work (PoW):** This is the most common method, used by Bitcoin and others. It requires significant computational power.

- ii. **Proof of Stake (PoS):** Instead of mining, participants validate transactions based on the number of coins they hold and are willing to "stake" (Blue et al., 2024)
- iii. **Other Algorithms:** Some cryptocurrencies use variations or different consensus mechanisms like Delegated Proof of Stake (DPoS), Proof of Authority (PoA) (Kumari et al., 2024).

2.4 Mining Hardware

- i. **ASICs (Application-Specific Integrated Circuits):** Highly specialized devices for mining specific coins like Bitcoin
- ii. **GPUs (Graphics Processing Units):** Versatile and can mine a variety of coins. Often used for Ethereum mining before its transition to PoS.
- iii. **CPUs (Central Processing Units):** Less common now due to lower efficiency but still used for mining some smaller cryptocurrencies (Kumari et al., 2024; Kurup & Jeba, 2024).

2.5 Mining Pools

Many miners join pools to combine their computational power, increasing the chances of earning rewards. Rewards are then distributed among participants based on their contributions (Hajiaghapour-Moghimani et al., 2024).

2.6 Profitability Factors

Electricity Costs: Mining consumes a lot of energy, and high electricity costs can eat into profits.

Difficulty Level: The more miners join the network, the harder it becomes to mine, which can affect profitability.

Market Price: The value of the cryptocurrency being mined directly impacts profitability (Dang et al., 2024).

2.7 Environmental Impact

Traditional mining methods, especially PoW, have faced criticism for their high energy consumption and carbon footprint. Some projects are exploring more sustainable practices (Brandon et al., 2024).

2.8 Regulations

Mining is subject to regulations that vary by country, including taxes, energy consumption regulations, and environmental laws. If you're considering getting into mining, make sure to do thorough research on the specific coins, required hardware, and overall costs involved! (Bozhko et al., 2024)

3.0 RESEARCH METHODOLOGY

The tactics, procedures, or techniques used in the gathering of data or evidence for analysis in order to find new information or develop a deeper understanding of a topic are known as research methodology.

3.1 Research Design

The research methodology of choice was the quantitative approach. The goal of the study was to gather particular information and ascertain the mathematical correlation between the variables pertaining to students' comprehension of crypto coins mining in postsecondary educational institutions. The following were the guiding concepts for selecting a research method:

1. The findings ought to be predicated on a sizable sample size that accurately reflects the total number of Nigerian students.
2. The researcher should formulate precise study questions that are meant to generate unbiased responses.
3. The study may be used to explore causal linkages, forecast future outcomes, or more broadly generalize concepts in the future.

Because online surveys can drastically cut down on turnaround time and expense while also potentially increasing survey item completion rates, the researchers in this work have opted to employ an online questionnaire style for the survey. If a computer can receive the survey in the first place, a survey questionnaire design that includes clear instructions can help respondents complete and return the survey accurately. Online questionnaire surveys can ask a variety of questions, just like paper-based surveys do. The online survey's design can also be improved to increase each item's response rate (Regmi PR et al., 2016).

Many experimental studies have demonstrated the above benefits. For instance, Columbia University researchers investigated the characteristics of a new measure of sexual orientation by tracking intranet network traffic for two weeks and compiling all posts on two newsgroups that were relevant to their study (Rudd et al., 2023).

Using the Google Forms survey tool, we created a questionnaire to collect data on the subject matter. There were five parts to the survey. The first section sought to determine the demographic information of the respondents, including age, gender, major, and academic year. An eligibility question for the next analysis phase was also included in this section: Are you familiar with the term "cryptocurrency"?

For the purpose of evaluating the hypothesis, only answers from those who acknowledged knowledge of cryptocurrency were taken into account, next section collects information about knowledge of mining apps and exchangers while the last section were based on how the respondents manage study time and the crypto coins mining (438 samples).

3.2 Sample Size

The survey was completed by 359 students from all higher institutions in Katsina State, with a sample size of 385 out of the population of 2,500,000. The analysis includes every response.

3.3 Data analysis

The data was collected using the Google Form online survey tool, and the data was analyzed using SPSS 22, NVivo 14.23.0, and Microsoft Excel 2010.

3.2 Research Questions

The following research questions were developed in order to properly and appropriately guide the investigation and accomplish the goals and objectives of the study:

1. What are some possible distractions related to the variable nature of cryptocurrency mining among college students, and how could they affect students?
2. What effects does crypto Coins Mining have on students' ability to concentrate and their general academic performance?
3. What potential advantages might result from an increase in cryptocurrency mining among Tertiary Institution students?

4.0 Data Presentation & Discussion

The results of the analysis and interpretation of the survey-based data collected online through an electronic questionnaire are presented in this section.

4.1 Data Presentation

The study's findings showed that crypto coins mining have a significant detrimental effect on students' academic performance.

Table 1: Survey Questions and Response Discussion

DEMOGRAPHICS
AGE
Although the age range of the participants varied, most of them were between the ages of 20 and 30.
SEX
The survey shows that more women than men are using crypto coins mining apps. It was revealed that 40% identified as male while 60% as female..
EDUCATION LEVEL
85% of the sample consisted of undergraduate students, with 15% being graduate students.
LEVEL OF CRYPTO COINS MINING APP USAGE
The survey revealed that 70% of the participants use Crypto Coin Mining Apps every day, which is a substantial percentage and shows that students are really interested in digital currencies.

TYPES OF CRYPTO COINS MINING APPS USED BY STUDENTS
The following crypto coins mining apps identified to be the most popular among students: Tapswap, Hamster, Dotcoin, Yescoin, Wormfare Slap, Topcoin, MemeFi Coin, PocketFi, Fuel, Athene, Eagle Mining, Dogs Coin, Cats Coin, X-Empire, W-Coin, AVACOIN, SEED, Tomarket (Tomato), Major, Rockey Rabbit, Catizen, Gamee, CEX.IO Power Tap, Blum, Fintopio, Gemz, and HOT Wallet
ACADEMIC PERFORMANCE
The participants' average GPA was 3.0. This point to a reasonable degree of academic success. However, some individuals among the respondents dropped to 2.8 and 3.3, respectively, after maintaining at least 4.0 due to the involment in the crypto coins mining activities.
THE TYPICAL AMOUNT OF TIME SPENT STUDYING EACH WEEK
On average, participants said they studied for ten hours every week. This demonstrates a quite low dedication to advancing academic success.
PERFORMANCE CHANGES FOLLOWING PARTICIPATION IN CRYPTOCURRENCY MINING ACTIVITIES
The majority of participants (90%) stated that their performance had significantly decreased as a result of their involvement in cryptocurrency mining activities. Academic performance is negatively impacted by this.
PRINCIPAL ADVANTAGES OF UTILIZING CRYPTOCURRENCY MINING APPLICATIONS
Improved financial literacy and enhanced problem-solving abilities were the primary advantages mentioned by participants, indicating some good results despite the overall detrimental effect.
THE PRIMARY DIFFICULTIES ASSOCIATED WITH CRYPTO COINS MINING ACTIVITIES
The primary issues raised by participants were elevated stress and trouble focusing, indicating the negative impact of cryptocurrency mining on academic achievements.

4.2 Discussion

It's interesting to note that only 9.00 percent of the students who took part said they had never heard of cryptocurrency mining, whereas 91.00 percent said they were active in. This number is not particularly surprising given how widespread cryptocurrencies are in the current technological era, particularly considering that Nigeria is among the top five nations in terms of bitcoin mining activity.

According to the study's findings, which are in line with some previous research, using cryptocurrencies has a detrimental effect on students' psychological health and academic achievement. A type of distraction from academic obligations is indicated by the high frequency of daily cryptocurrency (mining app) usage and frequent cryptocurrency market checks during study sessions. Furthermore, the participants' high reported levels of worry and anxiety demonstrate that using cryptocurrencies has a negative psychological impact.

5.0 Conclusion

The research assessed the influence of Crypto-Coins Mining among students In Nigerian Tertiary Institutions. The results showed a detrimental effect, with subjects reporting higher tension, anxiety, and concentration levels as well as altered academic performance as a result of crpto coins mining. Participants generally agreed that there was a negative impact on their academic achievement, notwithstanding some benefits that were mentioned, such as enhanced financial knowledge and problem-solving abilities.

The study also made clear how vital it is to address the detrimental effects of crypto coins mining on students' academic performance. Educational institutions and legislators can better assist students in comprehending digital finance and education if awareness is increased, support services are offered, and focused interventions are put in place.

5.1 Recommendation

Raising awareness of the dangers of crypto coins mining should be a top priority for Tertiary Institutions, which should also give students thorough information on the possible academic repercussions. Workshops, seminars, and instructional sessions might be arranged to teach parents, teachers, and students about the effects of crypto coins mining and how to do it responsibly.

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