

Assessment of Behavioral Impacts and Socio-Economic Status stand of Blockchain Games to Undergraduate Students in Metro Manila

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Abstract

Virtual Economies continue to be a global phenomenon, and cryptocurrency is prominent in this process, and it can be attained by playing blockchains. The rise of non-fungible tokens (NFTs) is also increasing the demand for Ethereum. Thus, these features encourage many people to earn money while playing it that even young people (most likely undergraduate students) invest. There is no doubt that it is a good business for financial risk and problems, it also provides much more significant opportunities and applications. Somehow the notions of blockchain technology provides some negative outcomes, specifically in the behavioral aspects of them. In this paper, the researchers focused on socioeconomic status and behavioral aspects of the players and considered these two as the factors in their perspective about the blockchain games. The results on socioeconomic shows that most of them are playing because of financial problems and sees this as an opportunity to have an income. The results on Behavioral impacts through pareto analysis shows that most respondents suffer from the negative impact of playing blockchain games, 66% of the respondents has lack of sleep, 53.5% less focus in studies, 39.5% less interactive and more. Tukey method is also use to analysis whether which questions is significantly important in terms of obtaining and analysis the results from the survey conducted. In conclusion the socioeconomic stand is likely to affect their perspective in the blockchain games and shows that these games can lead to addiction because of the time spend in playing, the anxiety with the game and other negative outcomes.

Keywords

Blockchain Games, Cryptocurrency, NFT's, Behavioral Impact and Socio Economic.

1. Introduction

Virtual Economies continue to be a global phenomenon. Industries worldwide seek more possible ways to incorporate this frankly advanced technology into their core services and products. Frequently, the world's connectivity is not happening in the cornered room, but sometimes in virtual environments, where people have access all over the world. In 2020, people witnessed several economies and industries shutting down due to the Covid-19 Pandemic and paved the way to the booming industry in the Business of Gaming as people naturally turn to seek various entertainment within their homes. Particularly online gaming has become a breeding ground for interesting innovation in this virtual space. Developers invent various new methods to leverage cryptos to purchase and trade in-game products, unlock different characters, exchange currency, and eventually make more money. Some developers are prompted to create software for virtual trading and business transaction systems. Hence, cryptocurrency is prominent in this process, and it can be attained by playing blockchains. According to Suleman (2019) study's with uncertainty, blockchain technology has allowed cryptocurrencies to emerge. Like the US dollar, cryptocurrency is also a medium of exchange. However, it is digital and encrypted to control the formation of multiple currency units. This particular technology has enabled companies around the world to make secure payments with complete records. Besides, earning while playing from blockchain games is attainable by the cryptocurrency called "Ethereum," It is used as the virtual money currency in DApps (Decentralized Applications). Radar (2021) study's with uncertainty, states that Open Sea, Uniswap, and Axie Infinity are the leading and top Ethereum DApps. The monetary unit for Ethereum is called "ether," wherein it

has a huge amount when converted to the Philippine Peso. According to Forbes (2021) study's with uncertainty, this currency has dynamic changes every minute because it fluctuates due to Ethereum's growth. A growing number of developers developing decentralized financial applications (DeFi) on the Ethereum blockchain platform is the particular reason. The rise of non-fungible tokens (NFTs) is also increasing the demand for Ethereum. Thus, these features encourage many people to earn money while playing it that even young people (most likely undergraduate students) invest.

However, there are some negative outcomes, specifically in the behavioral aspects of them. It can lead to lack of sleep, improper eating habits (not on time), less attraction and focus in their academics, and communication skills. The researchers' observations claimed this situation since it is somehow related to the effects of online gaming addiction. Still, blockchain games differ from this because of its financial benefits for the users. The said notion also encourages people to play, and it seems that blockchain games will answer their financial crisis by applying as scholars. Besides, some students decide not to enroll and stop their studies due to the pandemic. According to Mateo (2020), almost 44,000 college students may be unable to enroll in this academic year. The financial crisis is one of the factors since some of their parents or guardians became unemployed; hence, these students choose to play blockchain games to earn money and serve it as their source of income. With this stand, their socio-economic perspectives and status have a significant impact. The said problems mentioned above depict that Ethereum blockchain games affect the undergraduate students' behavioral aspect and socio-economic status stand. These ideas prompt the researchers to assess the factors and have a deeper understanding.

1.1. Objectives

The study's main objective is to acquire and analyze the behavioral effects that the users attained in playing blockchain games and whether their socioeconomic status has a significant role in having the resources to play these blockchain games, and discusses the following specific objectives.

- To analyze the various behavioral impacts, advantages and disadvantages that the blockchain games give off their players who are college students.
- To identify a significant relationship between the socioeconomic status and students/respondents being a player.
- To identify the factors suggesting that blockchain games are changing the business of gaming.
- To understand the real-world application of Virtual Economies deeply, how it changes the industry and how undergraduate students change their view about the various industry works. And to encourage students to be open to the different industries, not just focus on their chosen field.

2. Literature Review

2.1 Blockchain Technology

Blockchain system has become one of the most promising technologies since late 2017, nine years after the release of the famous Bitcoin whitepaper by Satoshi Nakamoto. Besides the classical application of the distributed public ledger, blockchain is now acknowledged as the foundation of decentralized applications or DApps (Tian et. al, 2019). Blockchain-based applications are emerging in a wide range of areas to revolutionize software practices. Blockchains use technologies like distributed ledgers, and consensual algorithms to provide peer-to-peer solutions that offer advantages such as transparency, traceability and immutability (Nyyssölä, 2020). The blockchain is one of the essential underpinning technologies supporting Bitcoin, the first decentralized, peer-to-peer cryptocurrency success in history. As a financial platform, Bitcoin needs a tremendous digital book to log all transactions. Blockchain is the technology that provides such a record and records every transaction on the cryptocurrency network—originally overshadowed by Bitcoin, blockchains have gained relevance in recent years as an autonomous technology that could be deployed in sectors other than finance (Zambrano, 2017). NFT is the new type of unique and indivisible blockchain-based tokens; which in contrast with fungible tokens that enable with new use cases such as initial coin offerings, NFL differ from fungible tokens in two important aspects. Every NFT is unique and it cannot be divided or merged (Regner, et. al, 2019). NFTs are typically bought, offered, and traded from wallets and may be explored, if public, on web sites together with blockchain, token view, and BTC. The system includes roles. NFT proprietor and NFT buyer. A proprietor digitizes the raw statistics from the transaction into the right format, then sells it on a database outside to the blockchain. NFT is connected completely to the precise identifier and the dispensed blockchain record, in which it cannot be altered (Cornelius, 2021).

2.2 Financial Applications

Currently, blockchain technology is applied to a wide variety of financial fields, including business services, settlement of financial assets, prediction markets and economic transactions (Haferkorn and Quintana Diaz, 2015). Blockchain is expected to play an essential role in the sustainable development of the global economy, bringing benefits to consumers, to the current banking system and the whole society in general (Nguyen, 2016).

In recent years, a diverse set of stakeholders has established themselves along with the media value chain: artists as primary content creators, aggregators, and platform providers, plus a royalty-collecting organization. With the advent of the blockchain, that industry structure could change dramatically. Blockchain technology makes it possible to bypass content aggregators, platform providers, and royalty collecting associations to a large extent. Thus, market power moves towards copyright owners. While some applications of blockchain technology may seem outlandish and require new technological advances, use cases that focus on payments have a proven track record. As a result, new blockchain based payment and contract options already threaten parts of the media value chain (Gramatke et. al, 2017). Using the Blockchain System can fundamentally reintroduce pricing, advertising, revenue sharing, and royalty payment processes. Income from payments or advertising is no longer required to be collected centrally. Payment transactions become cheaper, and revenue distribution is automated based on predefined smart contracts. Blockchain-enabled micropayments helps publishers to monetize this flexibility-seeking customer. Through the help of a blockchain, individual articles or other pieces of content could be sold forentices without disproportionate transaction costs.

2.3 Blockchain technology-based games

Blockchain technology-based games are profound as Crypto based games. It offers a decentralize environment that can support that goal by enabling, among other things, all users to share the same data version. cryptocurrency is merely "a chain of digital signatures" and sited as "each owner transfers the coin to the next by digitally signing a hash of the previous transaction and the public key of the next owner and adding these to the end of the coin" so that the possession can be made into the coin (Farell, 2015). The decentralization of the game and digital assets allows players unbridled freedom in which creativity is rewarded and the only limit is truly your imagination. Participants of a network can only append data but not modify stored data. This property suits to science that should not underlie any censorship. Everyone should be able to freely express his or her opinion without getting restricted in any way. Some known and massive games that are already existing in the market are Axie Infinity, a digital pet community in which you buy creatures – called Axies – and use them to battle, explore and breed with other Axies. CryptoKitties, a breeding in-game mechanic that requires certain conditions be met blockchain transaction that generates a new NFT. Another massive blockchain game is The Sandbox, it's a more traditional game in the vein of Minecraft or Roblox that pivoted to blockchain. The Sandbox's blockchain tech is used for the creation of its unique cryptocurrency called Sand. Players get access to a toolkit that allows them to build pretty much anything, and those assets are sold on a marketplace and also features a limited amount of real estate on its in-game map. Age of Rust, a sci-fi adventure puts the player in the role of an explorer and the ultimate reward is getting crypto for solving puzzles and finding the hidden treasure. PixEOS Game, 'Where games and art collide' is this cool little project's motto and displays artwork from users and shares them with the fellow art community. Evolution Land, a game where players in the blockchain model of gaming by dealing with cross-chain transactions. Players will mine the land, look for resources, set tax rates on the land, buy, and sell the land, and more. It mashes up different types of gameplay like auctions, micromanagement, combat, and much more. These are just a mere example of how wide blockchain games can go. With an open and free marketplace amongst gamers, cryptocurrency flowing, and the ultimate decentralization of game worlds, blockchain could be the next big gaming craze.

2.4 Impact of Crypto-based games

Due to the non-stop desires of improvement within the video games and their techniques, the issues of the usage of those video games are increased. In addition, its miles proven that almost all of gamers are kids or teenagers, which results in alternate the belief approximately video games to be only for unique or for time-consuming. Video games can affect human behaviors, whether or not those behaviors are proper or bad (Quwaider et. al, 2019). Behaviors and feelings at some stage in gambling the sport or after finishing the sport, for both brief time or lengthy time. Mental functioning with reference to mental symptoms, affectivity, coping, and self-esteem. Moreover, gamers' motives for gambling and their favored sport genres have been differentially associated with mental functioning with the maximum outstanding findings for distraction-stimulated gamers in addition to motion sport gamers (Von der Heiden et. al, 2019). Some studies show that prosocial video games were positively associated with the tendency to maintain positive affective relationships, cooperation and sharing, and empathy. This association remained significant after controlling for their socioeconomic status, and it could develop empathic concern and improve effective relationships in a diverse

population of young people (Harrington B., O’Connell M., 2016). Some studies suggest that some participants are glad and enjoying gambling laptop video games with their peers, although video games have high quality and poor outcomes to the behavioral improvement of the respondent and video games now no longer make the most effective adjustments to how our brains carry out however additionally their shape. Furthermore, the areas of the mind that play a function of interest are greater green in game enthusiasts as compared with non-game enthusiasts, and that they require much less activation to live centered on annoying tasks (Nichols 2017).

3. Methods

3.1. Conceptual Framework

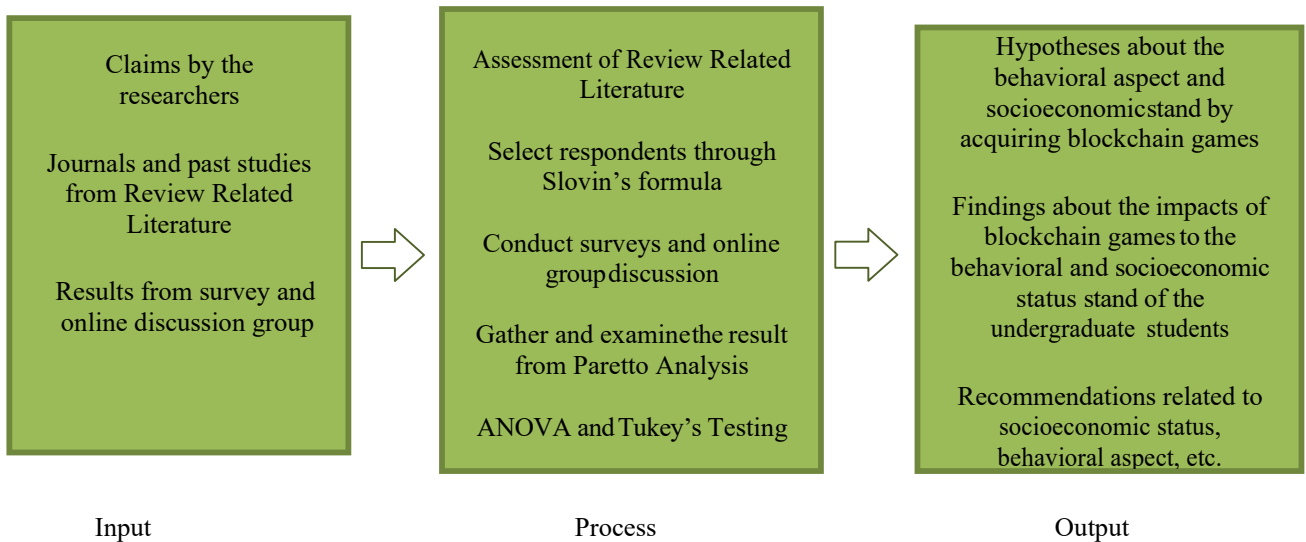


Figure 1. Conceptual Framework

The study's conceptual framework is interpreted in Figure 1, based on the Input-Process-Output (IPO) Model. The inputs of the study are the following: claims by the researchers, journals, and past studies from the Review Related Literature section of the study, and the result from the survey and online discussion group. It helps the researchers to obtain new findings and conclusions. Moreover, the researchers gather and examine the results from the surveys and online discussion groups to determine how blockchain games affect their behavioral aspects and socio-economic status. The researchers will use Slovin’s formula to select the exact number of respondents. Besides, this study will plot the result through Pareto Analysis, Anova, and Tukey’s Testing. The hypothesis, findings, conclusions, and recommendations will serve as the output of the research.

3.2. Research Design and Instrument

This is descriptive design research that will use Input-Output (IPO) models to find the significant impacts of blockchain games on the behavioral aspects and socioeconomic status of undergraduate students. This type of design will aim to accurately and systematically describe the population and its stand related to the study. Besides, this research design will identify the 4Ws (who, what, where, and when) and 1H (how) questions that can obtain information.

4. Data Collection

The study used a simple random sampling technique with Slovin's formula to determine the number of respondents who are playing blockchain games. Not all undergraduate students in NCR would serve as respondents in this study. However, the sample will be representative of the population. The data gathered from the respondents have been computed, measured, and interpreted. The researchers used a marginal error of 5% as the basis and used Slovin's formula.

$$n = N / (1 + Ne^2)$$

n = number of samples (1)
 N = total population (2)
 e = margin of error (3)

The data obtained by the researchers are acquired through observation and on-hand experience from 400 undergraduate students who are into playing blockchain games to help the study gain precise and manageable information. The observation process allows researchers to gather available data from existing studies and articles. On-hand experience and survey forms are also to be employed to analyze the participants' socio-economic status and whether it affects the resources used to play these crypto games and the behavioral effects that the players obtained from playing them. This study aims to use qualitative methods as well as quantitative methods to be able to help analyze the proposed topic. Using measurable research questions, such as descriptive and comparative questions, enables the researchers to use data and statistics to obtain a precise observation and compare the students' effects in playing these blockchain games.

5. Results and Discussion

5.1. Graphical Results

5.1.1 Knowledge and Experience About Blockchain Games

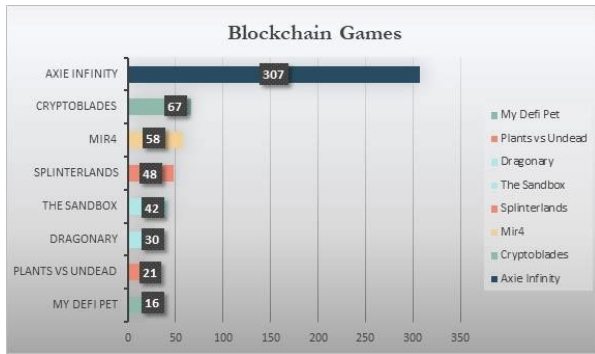


Figure 2. Blockchain games played or owned

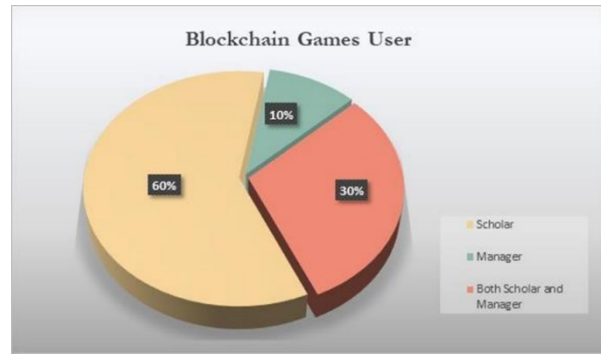


Figure 3. Blockchain games user

The data from Figure 2 shows that most of the respondents play and own Axie Infinity, with 307 respondents answered for it (76.9%). It shows that this blockchain game is in demand nowadays. The following blockchain games are Cryptoblades, MIR4, Splinterlands, The Sandbox, Dragonary, Plants vs. Undead, and My Defi Pet. The data from figure 3 most of the respondents and interviewees in the discussion group are scholars, which means they just play the blockchain games without investing too much money and they have their own managers who provide their team.

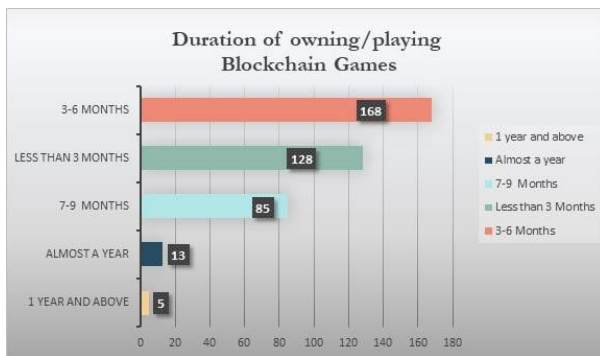


Figure 4. Duration of owning or playing

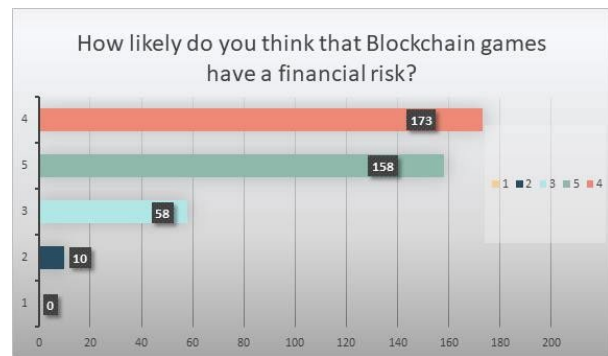


Figure 5. Income earned in playing or managing

For the duration from Figure 4., 168 out of 399 of the respondents (42.1%) played or owned blockchain games for three (3) months to six (6) months—also, 128 among them (32.1%) have a duration of less than three (3) months. The least of the respondents played or owned blockchain games one (1) year and above. It shows that blockchain games are still new and booming this year. Related to their income in playing or owning blockchain games from the Figure

5, most of them earn 11,000 Pesos to 30,000 Pesos per month since 170 out of 399 (42.6%) answered for it. As to participant 2, “These games are played to earn, pwede kang kumita while playing.... It takes time para bumalik kita nila.” (These games are played to earn, there is a chance of earning while playing.)

Socio-Economic Status Stand

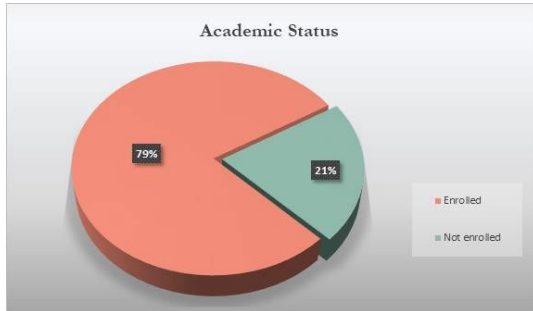


Figure 6. Academic Status

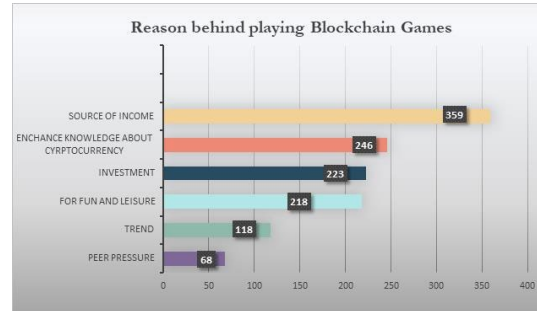


Figure 7. Reason behind playing blockchain games

For the next category, which is understanding their Socio-Economic Status from Figure 6; 79% of the respondents are enrolled and 21% are not enrolled. It shows that blockchain games are in demand despite having school works and a source of income to the others. From the perspective of unenrolled college students, 35.1 % of the respondents said that they have a financial issue. In addition, participant 2 said that pandemic affects him in enrolling for this school year. They also believe that playing blockchain games is a good alternative to attain the job. It is supported by the quotation of participant 4 “Kasi if yung kinikita mo sa block chain games is mas mataas kesa sa kinikita mo sa pagtatrabaho mo, bakit hindi?”.

For the respondents’ reasons for playing or owning the blockchain games in the Figure 7, they have multiple reasons. And as the result shows, playing it as a source of income is the primary reason. As of participant 4 “Nabibili ko yung mga luho ko.” (I can buy my wants). Also, participant 5 said that “Pambayad ng mga bills...” (Expense for monthly bills), and participant 1 stated that “Pantulong narin sa pamilya.” (Financial help for my family). The researchers conclude that their earnings are for their financial stability despite having 30,000 Pesos and below the parent’s accumulated income and living in owned houses. Besides, blockchain games are helpful in terms of their socioeconomic status.

5.1.2 Behavioral Impacts of Blockchain Games

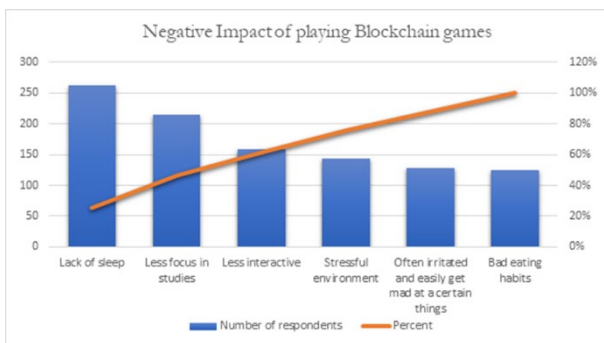


Figure 8. Pareto Analysis of the negative impact

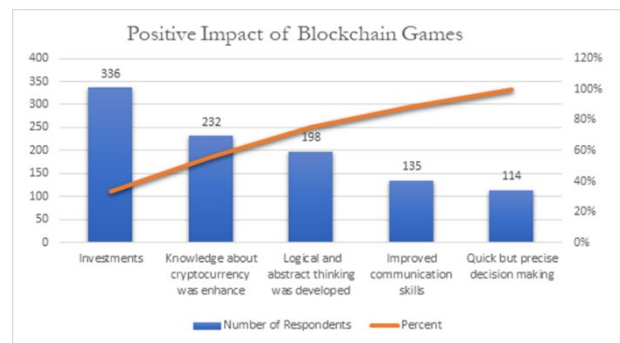


Figure 9. Pareto Analysis of the positive impact

Through Pareto analysis, the researchers conclude the negative impacts of playing or owning blockchain games. As the graph shows in Figure 8., having a lack of sleep is the primary negative outcome for this. Based on the Likert scale provided in the Google Form survey, most of the respondents scaled 4 in the question “Do you encounter a long time of maintenance or experience some bugs?” Thus, the said technical problem affects their sleeping habit since the server for some blockchain games is better in the late evenings. However, blockchain games still have a positive impact on them as shows in the Figure 9., as the Pareto Analysis shows, Investment is the primary positive income since both manager

and scholar earn money while handling this. Also, respondents gained knowledge about cryptocurrency and their logical and abstract thinking was developed. These learnings are considered as their stepping stone to earn money in the crypto world. Lastly, their communication skills and decision-making were improved.

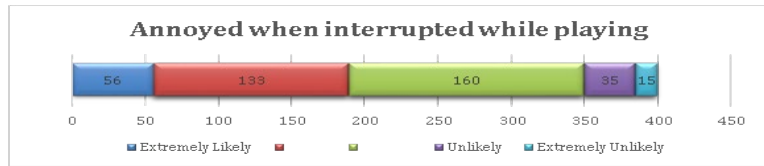


Figure 10. Likert Scale of do the respondents feel annoyed whenever they are interrupted while playing

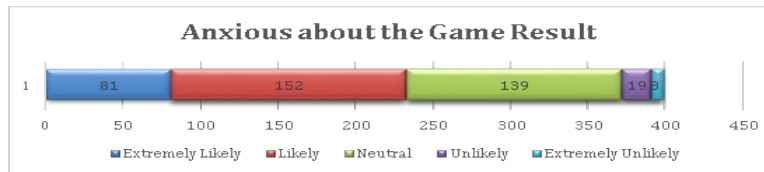


Figure 11. Likert Scale of do the respondents feel anxious about a game result

As the data shows in figure 10 and figure 11, the most answer is neutral. It shows that they somehow feel annoyed whenever they are interrupted while playing. It illustrates that most of the respondents (152 out of 400) answered likely for this question. In addition, Participant 3 said that “*Minsan talaga pag naglalaro, hindi maiiwasan yung mahinang net kaya matatalo tapos medyo mababadtrip ako after the game.*” (Sometimes, poor internet connection is usual so there is a tendency of losing. Then after the game, I’m displeas about the game result). This shows that poor internet connection may affect their playing and cause losing, which can be a source of stress.

5.2. Numerical Results

Tukey’s Single-Step Multiple Comparison Procedure and Statistical Test

Traditionally, researchers compare two observation groups through the use of a T-test. But in this case, there is multiple set of observation and claims that are required to compare and the T-test is not applicable. Thus, the researchers plump to the decision to use one-way analysis of variance, which is ANOVA testing. It evaluates if the means of the populations differ from each other. In this case, the significant role of Tukey's multiple comparison test falls since it compares the difference between pairs of means. These statistical tools are done with the help of a Microsoft Excel solver and Minitab.

Table 1. ANOVA Method used for Knowledge about the Blockchain Games

Method	
Null hypothesis	All means are equal
Alternative hypothesis	Not all means are equal
Significance level	$\alpha = 0.05$
<i>Equal variances were assumed for the analysis.</i>	

Anova method (table 1) to be considered as an objective statement of the Knowledge of the respondents about the Block chain games, which determines the null hypothesis and alternative hypothesis, significance level of 0.05 and 95% level of confidence interval (CI).

Section 1. Knowledge about the Blockchain Games

This contains the Tukey and ANOVA results from the questions under the section of the respondent’s knowledge about the block chain games. The following are the questions.

- A - How much, if at all, have you heard or read about blockchain games such as Axie Infinity, and etc.?

- B - How likely are you to invest in cryptocurrency or invest in playing Blockchain games?
- C - How likely do you think that Blockchain games have a financial risk?
- D - How likely do you think that Blockchain games are profitable?

Hypothesis:

- A. Null Hypothesis: The knowledge of users does not affect their perspective in terms of the Blockchain.
 B. Alternative Hypothesis: The knowledge of users affects their perspective in terms of the Blockchain.

One-way ANOVA Results

Table 2. Analysis of Variance for Knowledge about the Blockchain Games

Source	DF	Adj SS	Adj MS	F-Value	P- Value
Factor	4	199676	29919.0	164.15	0.00
Error	16	2734	182.3		
Total	19	122410			

Table 3. Mean Summary Results for Knowledge about the Blockchain Games

Factor	N	Mean	StDev	95% CI
Extremely Likely	4	163.3	21.8	(148.9, 177.6)
Likely	4	181.50	18.16	(164.11, 195.89)
Neutral	4	47.75	9.18	(33.36, 62.14)
Unlikely	4	6.75	4.35	(-7.64, 21.14)
Extremely Unlikely	4	0.750	1.500	(-13.638, 15.138)

Pooled StDev = 13.5006

Table 4. Tukey Pairwise Comparisons for Knowledge about the Blockchain Games

Factor	Mean	Grouping	
Extremely Likely	163.3	A	
Likely	181.50	A	
Neutral	47.75		B
Unlikely	6.75		C
Extremely Unlikely	0.750		C

**Note: Means that do not share a letter are significantly different.*

Based on the statistical rule, if the P-Value is less than 0.05, reject the null hypothesis. Thus, the result shows in table 2, table 3 and table 4, attain this and the alternative hypothesis will have accepted, which is the knowledge of users affects their perspective in terms of the Blockchain. This table depicts that the group A contains extremely likely and likely, group B contains neutral factor, and group C contains unlikely and extremely likely. Also, it shows that all of the factors do not share any letter. This result indicates that they have a mean difference, which is significant different to each other.

Section 2. Socioeconomic Status of Enrolled Player

This contains the Tukey and ANOVA results from the questions under the section of the socioeconomic status of the enrolled players. The following are the questions.

- E - In 5 years or so, do you think blockchain games will still be worth more today?
- F - Do you encounter a long time of maintenance or experience some bugs
- G - Do you think it helps you to pay your monthly expenses?
- Hypothesis:

- A. Null Hypothesis: There is no significant relationship between socioeconomic status and perspective of enrolled users about Blockchain games.
- B. Alternative Hypothesis: There is a significant relationship between socioeconomic status and perspective of enrolled users about Blockchain games.

One-way ANOVA Results

Table 5. Analysis of Variance for Socioeconomic Status of Enrolled Players

Source	DF	Adj SS	Adj MS	F-Value	P- Value
Factor	4	59753	14938	7.81	0.004
Error	10	19131	1913		
Total	14	78884			

Table 6. Mean Summary Results for Socioeconomic Status of Enrolled Players

Factor	N	Mean	StDev	95% CI
Extremely Likely	3	151.0	79.5	(94.7, 212.3)
Likely	3	156.0	38.2	(99.7, 212.3)
Neutral	3	63.3	17.4	(7.1, 119.6)
Unlikely	3	27.7	38.4	(-28.6, 83.9)
Extremely Unlikely	3	2.00	1.00	(-54.267, 58.267)

Pooled StDev = 43.7394

Table 7. Tukey Pairwise Comparisons for Socioeconomic Status of Enrolled Players

Factor	Mean	Grouping
Extremely Likely	151.0	A
Likely	156.0	A
Neutral	63.3	A B
Unlikely	27.7	B
Extremely Unlikely	2.00	B

**Note: Means that do not share a letter are significantly different.*

Since the table shows that the P-Value is 0.004. The researchers followed the statistical rule, wherein P-Value is less than zero, reject the null hypothesis. Thus, the result shows the alternative hypothesis will have accepted, and there is a significant relationship between socioeconomic status and perspective of enrolled users about Blockchain games. This tables (table 5, table 6, table 7) depicts that the group A contains extremely likely and likely, and group B contains unlikely and extremely likely factor. It shows that all of the factors do not share any letter. This indicates that they have a mean difference, which is significant different to each other. On the other hand, both of these groups contain neutral factor. It means that there is no significance.

Section 3. Behavioral Impact of Blockchain Games for the Users

This contains the Tukey and ANOVA results from the questions under the section of the behavioural impact of blockchain games for the users. The following are the questions.

- J - Do you still attain good sleeping habits? (Maintain 6 hours to 8 hours of sleeping)
- K – Do you feel annoyed whenever you are interrupted while playing?
- L – Are you having the urge to play games even when you are doing other things?
- M – Do you feel anxious if the game result is not according to what you expected?
- N – Do you still attain time management?
- – Do you prioritize your "daily gaming grind" before doing other things?
- Hypothesis:

- A. Null Hypothesis: There is no behavioral impact of Blockchain Games for the users.
- B. Alternative Hypothesis: There is a behavioral impact of Blockchain Games for the users.

One-way ANOVA Results

Table 8. Analysis of Variance for Behavioral Impact of Blockchain Games for the Users

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Factor	4	70775	17693.7	41.61	0.00
Error	25	10631	425.3		
Total	29	81406			

Table 9. Mean Summary Results for Behavioral Impact of Blockchain Games for the Users

Factor	N	Mean	StDev	95% CI
Extremely Likely	6	67.33	19.76	(49.99, 84.67)
Likely	6	139.67	20.68	(122.3, 157.01)
Neutral	6	131.00	19.65	(113.66, 148.34)
Unlikely	6	49.3	30.2	(32.0, 66.7)
Extremely Unlikely	6	12.67	3.08	(-4.67, 30.01)

Pooled StDev = 20.6217

Table 10. Tukey Pairwise Comparisons for Behavioral Impact of Blockchain Games for the Users

Factor	Mean	Grouping
Extremely Likely	67.33	A
Likely	139.67	A
Neutral	131.00	B
Unlikely	49.3	B
Extremely Unlikely	12.67	C

**Note: Means that do not share a letter are significantly different.*

Based on the statistical rule, if the P-Value is less than 0.05, reject the null hypothesis. Thus, the result shows in tables 8-10, attain this and the alternative hypothesis will have accepted, which is the knowledge of users affects their perspective in terms of the Blockchain. The Tukey results depicts that the group A contains extremely likely and likely, group B contains neutral and unlikely factors, and group C contains extremely likely. Also, it shows that all of the factors do not share any letter. This result indicates that they have a mean difference, which is significant different to each other.

6. Conclusion

This section discusses the conclusion based on the results in the previous chapter, which is supported by statistical tools, data from the survey, and online discussion group. In this paper, the socioeconomic status and behavioral aspects of the players were focused. The researchers considered these two as the factors in their perspective about the blockchain games. At this juncture, the socioeconomic stand of the respondents has a significant role in playing blockchain games. Despite of their socio-economic status, these players tend to earn money to help their family and for their personal wants and needs (as the respondents said in the online discussion group). Thus, their socioeconomic stand is likely to affect their perspective in the blockchain games. On the other hand, the researchers conclude that blockchain games are likely (Figure 5.1.6.) to affect the behavioral aspects of the respondents. It shows that these games can relate to other online games (such as DOTA, League of Legends, CrossFire, etc.) that can lead to addiction since they play blockchain games three (3) hours and above every day, feel anxiety with game results, annoyed when the game is interrupted, etc. The researchers also found out that internet connection may affect the behavior of player (Figure 5.1.12). In this reason, Blockchain games can be a source of stress. However, blockchain games have positive outcomes for the players. Based on the result from the Pareto Analysis, having an investment is the primary positive

effect. On the other hand, negative effects exist such as lack of sleep, less focus in studies, etc. (Figure 5.1.11.), which requires recommendations.

6.1. Proposed Improvements

- Players of blockchain games must have terms and conditions letter to prevent scams and attain profitability or good investment since it will serve as the guidelines for both parties (managers and scholars).
- Both players and managers must have adequate knowledge and acumen about cryptocurrency and trading to understand more the money cycle in this aspect.
- Create a to-do list virtually rather than in writing in sticky notes or notepad paper. Most of the players used their devices like mobile phones and personal computers and this reason will show that pinning to-do virtually is more effective since they can notify easily. This recommendation will help them to attain time management.
- Watch online streams to motivate and relax them. Also, this will help the users to gain knowledge and strategies in playing blockchain games.
- Both manager and players should and must understand what kind of world they entered in, by motivating them in a way that they both understood and comfortable with.

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