



Blockchain Technology Transfer for Student Business Startup and E-Business: A Study on Future of Metaverse in Education

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Abstract

The study conducts to measure the impact of blockchain technology (BT) teaching on student business startup and e-business. Random sampling technique is used to collect quantitative data. The study considered a 5-point Likert scale questionnaire, and respondents were students enrolled in business programs in different universities in Japan. The study investigated that BT significantly impacts student business startup and e-business. The research theoretically introduced a new dimension of BT use for student business startup. The practice of this research across universities would improve students' understanding towards their e-business.

Introduction

The growth and improvement of modern technologies has reformed how businesses operate providing cutting-edge way out (Duan, Zhong, & Liu, 2017). According to Li and Wu (2019), blockchain technology (BT) is well-known in industrial use such as secure transactions and working. It is not only related to crypto business, but it has practical implication in other sphere of market and business (Alammery et al., 2019). The role of BT has become critical in advancement of business

in the modern world (Yumna et al., 2019), as it helps to ensure the efficiency and integrity in data (Roman-Belmonte, De la Corte-Rodriguez, & Rodriguez-Merchan, 2018). According to Williams (2019), the students are still less information and practicing the use of modern technology in the business environment. Therefore, this is a gap in practice which needs significant attention to improve the use of BT for market scenario. Students are required to use BT to start their business (see Figure 1).

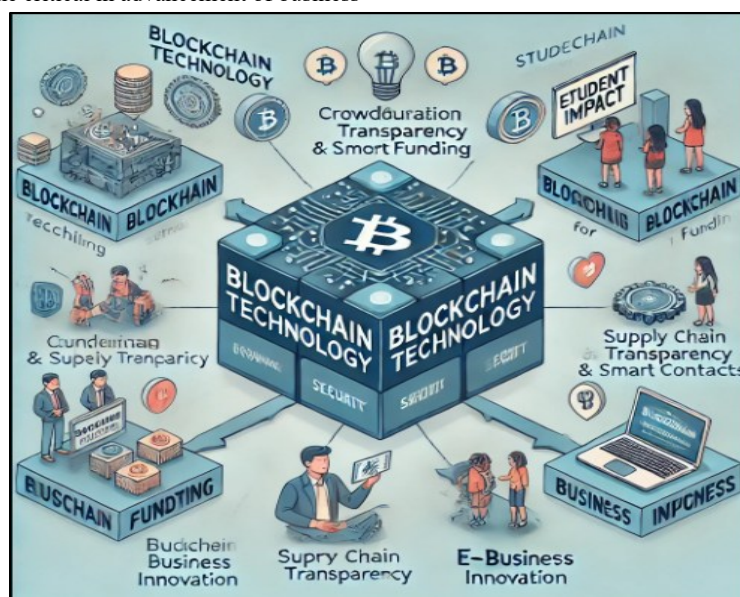


Figure 1: Blockchain Technology and Student Business.

The business models are changing over the time which is also problematic for entrepreneurs (Turkanović et al., 2018).

The newly startup business by the students face barriers in their growth which include the lack of resources and significant

practices to improve the functions (Ocheja et al., 2019). According to Chen et al. (2018), the cyberattacks on e-businesses is a challenge for the new business owners as they have limited access to technology. On the other hand, the fair use of block chain technology in new business can facilitate to advance the business practices strategically (Fernández-Caramés & Fraga-Lamas, 2019). Pfeiffer and Koenig (2019) discussed if the students have no awareness about the fair use of BT, it becomes difficult for them to start a business and grow in the market. In this way, the teaching of BT to the students is a significant factor to improve their business practices.

Although the existing studies have discusses significant importance of BT (Kamışalić et al., 2019), a limited number of studies have debated the use of BT in business use. Therefore, there is a need of research to provide understanding related to the use of BT for business environment (Dettling, 2018). According to Ako-Nai, Tan and de la Cal Marin (2019), it is important to conduct further research on the use of BT by the students to start their business as it would be helpful to design the educational programs which can support BT. The study conduct to measure the impact of BT teaching on student business startup and e-business. Random sampling technique is used to collect quantitative data. The study considered a 7-point Likert scale questionnaire, and respondents were students enrolled in business programs in different universities in Japan. The study investigated that BT significantly impacts student business startup and e-business. The research theoretically introduced a new dimension of BT use for student business startup. The practice of this research across universities would improve students' understanding towards their e-business.

Review of Literature



Figure 2: Metaverse and Business.

Blockchain Technology and Business

The emerging role of BT in business environment is critical to attract more people (Dettling, 2018). The business strategies

Metaverse and Business

Metaverse is considered as a significant factor to improve the performance of business (Lee et al., 2011). It helps to connect the consumers with online platforms that engage people to communicate (Papagiannidis, Bourlakis, & Li, 2008). The message of brands is conveyed significantly using metaverse that is significant for the performance of business (Dioniso, Burns III, & Gilbert, 2013). It helps to improve the business strategies that are necessary to regulate the business mechanism (Bourlakis, Papagiannidis, & Li, 2009). The virtual reality becomes a significant factor in connection with business audience which is helpful based on metaverse (Gadalla, Keeling, & Abosag, 2013). The role of metaverse is critical to strategically develop the business that is essential for business performance and managerial activities (Dolan & Raich, 2009). The focus of metaverse is to use the virtual reality in business that can facilitate the public to improve their business practices strategically. However, the online platform businesses are recommended to use metaverse in developing a big consumer association of consumers with the business (Rathore, 2018). Moreover, the integration of metaverse in business strategically improve the practices of business which are necessary to connect the consumers (Power & Teigland, 2013). The virtual experience of the consumers to the markets is necessary to analyze the business strategies logically (Swilley, 2015). Hence, connecting the business in the modern marketing atmosphere is considered significant with the help of metaverse. There are many opportunities to integrate metaverse with business (see Figure 2).

are developed on management of practices that are necessary to develop business (Beck et al., 2017). It is recommended to work strategically on BT which is necessary to adhere business

practices logically (Nowiński & Kozma, 2017). The reliable way of business practices and advancement in the working can influence business mechanism critically (Konstantinidis et al., 2018). When the integration of business is done with BT, it can become a significant factor for improving it in the long term (Morkunas, Paschen, & Boon, 2019). The strategic approach to deal with business can be a way forward in business development. It is highly recommended that the business practices should be according to the modern development where the fair use of BT should be considered

(Niranjanamurthy, Nithya, & Jagannatha, 2019). In the traditional payment system for online business, there were some breaches in the payment, but the use of BT is considered as significant factor to deal with all of these challenges (Zhang & Wen, 2017). In this way, the use of BT is considered as a way forward in modern business development. The strategic improvements of business and fair use of BT can become a positive influencing factor to deal with business strategically (Efanov & Roschin, 2018). There is a significant impact of BT on business and economy (see Figure 3).

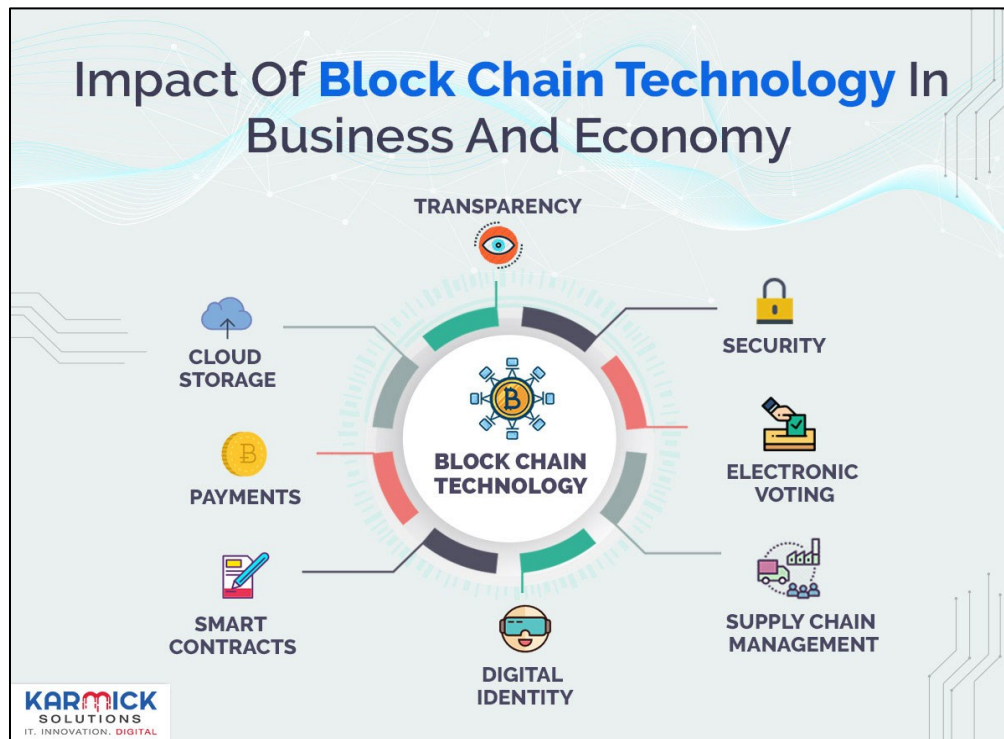


Figure 3: Blockchain Technology and Business.

Hypotheses Development

According to Yumna et al. (2019), BT learning is important for students to improve their business practices. Blockchain, with its decentralized and secure framework (Ako-Nai et al., 2019), that is helpful to design the modern business on internet platforms (Nokiti & Yusof, 2019). Furthermore, Pfeiffer and Koenig (2019) it is important to introduce BT which can help students to learn and perform critically. According to Williams (2019), the knowledge about blockchain can support student to improve their understanding which is critical for their performance. Furthermore, when the students are interested to learn and improve their skills with BT (Kamishalić et al., 2019) it becomes effective for them to improve their performance. However, Weng, Li and Wu (2019) discussed that the students should be exposed to the use of BT which is helpful for them to improve their learning. Moreover, Ocheja et al. (2019) discussed that cutting edge technology such as blockchain helps students to understand the design of business that is critical to their performance. Consequently, the BT provides a way

forward to improve the understanding of the students if the teachers are providing them technology with reasonable resources (Dettling, 2018). Therefore, the following hypothesis is purposed.

Hypothesis 1: *Blockchain technology teaching positively influences student business startup.*

The modern e-businesses are working with the support of BT (Chen et al., 2018). According to Niranjanamurthy et al. (2019), e-commerce platforms has become secure with the integration of BT which is a way forward for business practices. Furthermore, the existing literature reports that BT is a way forward for business development on internet platforms (Roman-Belmonte et al., 2018). According to scholars, it is necessary to teach BT to the entrepreneurship students which can develop their understanding better in different learning environment. Furthermore, Fernández-Caramés and Fraga-Lamas (2019) pointed out that BT teaching helps students to understanding the critical concepts for secure payment and

order confirmation. According to Alammery et al. (2019), it helps to design the architecture in better way which is helpful for significant improvement in business development. On the other hand, Sahonero-Alvarez (2018) asserted that the fair use of BT in the market can serve as sustainable way of business performance with technical skills. Moreover, the literature suggests that learning BT is necessary for the students to improve their overall performance in the business environment (Farah et al., 2018), secure payments, and digital identity verification (Turkanović et al., 2018). Therefore, the following hypothesis is purposed.

Hypothesis 2: *Blockchain technology teaching positive influence on e-business.*

Methodology

This research used quantitative data to achieve its objective. The quantitative data was collected from primary sources. The instruments to collect quantitative data were taken from previous studies. However, the validity of the scale items was confirmed before the collection of data. The questionnaire was developed to collect data. The respondents were students enrolled in business programs in different universities in Japan. This sample was selected because these students had significant information about the business programs and they were getting lectures about the use of blockchain technology in business.

This study used purposive sampling to collect data. Purposive sampling is a significant method to survey the questionnaire to the respondents who have information about the particular phenomena and have significant characteristics to provide the data. The study distributed 700 questionnaires to collect the data. The printed questionnaires were used to collect the data. The respondents were requested to provide credible information about the study. The purpose of research was already explained to them. However, a usable sample of 596 responses was collected and finalized for this research. This study used IBM SPSS for analysis of data. It is a significant tool to perform the analysis related to any research. This tool is useful to analyze the descriptive as well as inferential data for any study. The findings of Pearson's correlation, ANOVA and regression were tested in this research.

Data Analysis and Findings

The findings of this study were checked for descriptive statistics. The study tested the normality of data at the first step. According to data in Table 1, all responses were significant and there was no missing value in it. Furthermore, the study tested the mean value and standard deviation was also significant for the data. On the other hand, the study checked the values of skewness and kurtosis to determine the normality of distribution of data. The findings of the study confirmed that all data was normally distributed as skewness and kurtosis between -3 and +3 was found. Hence, the descriptive statistics of the study were found significant and reported in Table 1.

Table 1: Descriptive Statistics.

	BTT	SBS	EB
Valid	596	596	596
Missing	0	0	0
Mean	3.342	3.337	3.310
Std. Deviation	1.171	1.175	1.208
Skewness	-0.055	-0.099	-0.045
Std. Error of Skewness	0.100	0.100	0.100
Kurtosis	-1.150	-1.065	-1.207
Std. Error of Kurtosis	0.200	0.200	0.200
Minimum	1.000	1.000	1.000
Maximum	5.000	5.000	5.000

BTT = Blockchain Technology Teaching, SBS = Student Business Startup and EB = E-Business

The frequency of distributed questionnaires was checked at second stage. Since the study used a five-point Likert scale for blockchain teaching, the responses were available on five scales. 20 responses were received on one, 160 were received on two, 133 were received on three, 162 were received on four and 121 were received on five. There was no missing value in the data and the findings are shown in Table 2.

Table 2: Frequencies for BTT.

BTT	Frequency	Percent	Valid Percent	Cumulative Percent
1	20	3.356	3.356	3.356
2	160	26.846	26.846	30.201
3	133	22.315	22.315	52.517
4	162	27.181	27.181	79.698
5	121	20.302	20.302	100.000
Missing	0	0.000		
Total	596	100.000		

Furthermore, the study used a five-point Likert scale for students' business startup, the responses were available on five scales. 26 responses were received on one, 147 were received on two, 142 were received on three, 162 were received on four and 119 were received on five. There was no missing value in the data and the findings are shown in Table 3.

Table 3: Frequencies for SBS.

SBS	Frequency	Percent	Valid Percent	Cumulative Percent
1	26	4.362	4.362	4.362
2	147	24.664	24.664	29.027
3	142	23.826	23.826	52.852
4	162	27.181	27.181	80.034
5	119	19.966	19.966	100.000
Missing	0	0.000		
Total	596	100.000		

Table 4: Frequencies for EB.

EB	Frequency	Percent	Valid Percent	Cumulative Percent
1	25	4.195	4.195	4.195
2	171	28.691	28.691	32.886
3	118	19.799	19.799	52.685
4	158	26.510	26.510	79.195
5	124	20.805	20.805	100.000
Missing	0	0.000		
Total	596	100.000		

Similarly, the study used a five-point Likert scale for e-business, the responses were available on five scales. 25 responses were received on one, 171 were received on two, 118 were received on three, 158 were received on four and 124 were received on five. There was no missing value in the data and the findings are shown in Table 4. The findings of Pearson's

correlations were tested to measure the correlations between the variables of this study. These correlations were checked to determine the direction and nature of relationships. The findings of $p < 0.05$ were considered significant for correlations. According to Table 5, all the variables of study were significantly correlated as significant threshold was achieved.

Table 5: Pearson's Correlations.

Variable		BTT	SBS	EB
1. BTT	n	—		
	Pearson's r	—		
	p-value	—		
	Covariance	—		
2. SBS	n	596	—	
	Pearson's r	0.593 ***	—	
	p-value	< .001	—	
	Covariance	0.815	—	
3. EB	n	596	596	—
	Pearson's r	0.620 ***	0.593 ***	—
	p-value	< .001	< .001	—
	Covariance	0.877	0.841	—

* $p < .05$, ** $p < .01$, *** $p < .001$

BTT = Blockchain Technology Teaching, SBS = Student Business Startup and EB = E-Business

On the other hand, the findings of model summary were tested to determine the characteristics of the model. The findings of R show the correlation between independent variables and dependent variables. A value of R more than 4 is accepted, and this study found R value is more than 0.593. Furthermore, the R square value highlights the total variance in the dependent variable based on independent variable and its value above 0.50 is accepted. In this study, the value for R square is 0.651. Finally, adjusted R square highlights the

Table 8: Coefficients.

Model		Unstandardized	Standard Error	Standardized	T	p
M ₀	(Intercept)	3.337	0.048		69.349	< .001
M ₁	(Intercept)	1.350	0.117		11.503	< .001
	BTT	0.594	0.033	0.593	17.933	< .001

BTT = Blockchain Technology Teaching

Lastly, the findings of regression coefficients were performed to test H2. The study tested H2 with $t > 1.96$ threshold. The findings in Table 9 confirmed that blockchain

Table 9: Coefficients.

Model		Unstandardized	Standard Error	Standardized	t	p
M ₀	(Intercept)	3.310	0.049		66.928	< .001
M ₁	(Intercept)	1.174	0.118		9.989	< .001
	BTT	0.639	0.033	0.620	19.257	< .001

BTT = Blockchain Technology Teaching

Discussion and Conclusion

The findings of this research are discussed in this section. Firstly, the study investigated that the impact of BT teaching is significant and positive on student business startup. The findings of H1 are compared with the previous studies. The findings of this hypothesis (H1) are aligned with the results of existing studies. According to Farah et al. (2018), blockchain information is important for the students to improve their

variation of findings based on the sample and population. There should be a minimum difference between R square and adjusted R square value which is achieved in this study (see Table 6).

Table 6: Model Summary.

Model	R	R ²	Adjusted R ²	RMSE
M ₀	0.000	0.000	0.000	1.175
M ₁	0.593	0.651	0.650	0.947

Note: M₁ includes BTT.

The findings of ANOVA were tested to determine the overall significant of the model. It is used to test if the model of the study is significant enough for further analysis. The p value is tested in this process which should be less than 0.05 with the 95% confidence interval. The study found that significant p value < .001 and ANOVA was significantly accepted (see Table 7).

Table 7: ANOVA.

Model		Sum of Squares	df	Mean Square	F	p
M ₁	Regression	288.444	1	288.444	321.594	< .001
	Residual	532.769	594	0.897		
	Total	821.213	595			

Note: M₁ includes BTT.

Note: The intercept model is omitted, as no meaningful information can be shown.

Moreover, the findings of regression coefficients were performed to test H1. The study tested H1 with $t > 1.96$ threshold. The findings in Table 8 confirmed that blockchain technology teaching has a significant impact on students' business startup. The results are shown in Table 8 with t value 17.933.

technology teaching has a significant impact on students' e-business. The results are shown in Table 9.

overall behaviour and performance. Furthermore, the study Nokiti and Yusof (2019) discussed that BT is a useful tool for students as it helps them to understand the requirements of modern market and improve their strategies effectively to deal with the issues. The study Weng et al. (2019) also pointed out that BT is significant factor to motivate students for business startup. To sum up, the discussion of the existing studies also supported the hypothesis that BT teaching is necessary for student business startup.

Secondly, the study also established that BT teaching positively and significantly influences e-business. The findings of H2 are compared with the existing studies. While [Niranjanamurthy et al. \(2019\)](#) discussed that BT teaching is a significant factor to lead students for e-business. Furthermore, [Choi et al. \(2019\)](#) pointed out that the role of BT is considered significant when the students are motivated to shift their business on online platforms. According to [Sharples and Domingue \(2016\)](#), the role of BT is critical to influence the business critically and develop strategies that are effective for business performance. Furthermore, [Sahonero-Alvarez \(2018\)](#) found that BT teaching becomes a factor to develop a network of business on internet platforms that is necessary for students' e-startup. By and large, the role of BT teaching to improve start e-business is also supported by existing studies.

This study emphasized on the teaching of BT to the students. It is considered as a significant factor for business development. The role of BT is necessary in advancements of business practices. Therefore, the students should be motivated positively to improve their learning and business practices. It is recommended that the students should focus on the use of BT for significant business performance. The teachers are also required to upgrade their knowledge related to BT. It would be helpful to teach the students and their learning performance would be improved. The students are also recommended to improve their learning with strategic performance.

Conclusion and Implications

Theoretically, this research is a significant contribution to the body of knowledge. Firstly, the study reports that BT teaching is a significant antecedent for student business startup. Secondly, this study asserted that BT teaching is a significant predictor for e-business. The findings of this research added into the literature that the fair teaching of BT to the students is necessary to improve their business startup and e-business practices. However, the existing studies in the literature prior to this research paid little attention to the use of BT for business practices particularly in the context of students. Therefore, this research improves our understanding of related to the use of BT teaching as a way forward to improve the business practices by the students.

Practically, this study recommends that BT teaching should be encouraged in the universities which can help the students to understanding it in business dynamics. The role of BT teaching and practices can improve the confidence of the students related to the business performance. In this way, the students can be more inclined to the sustainable development of business which is critical to improve the performance. On the other hand, the study recommends that practitioners with the help of university administrators should work to improve students learning related to cutting edge technology. It is important factor for the students to improve their business performance critically while understanding the need of BT. The emerging and developed technologies teaching can be helpful for the students to improve their business practices. Therefore,

the teachers also should have updated knowledge which could serve as a factor to improve their business practices.

Future Directions

The findings of this research have some limitations which should be addressed by future studies. This study at first collected data from population in Japan which is required to be addressed in the future studies as it has limitations. The future research is required to collect data from other geographical locations such as Taiwan to contribute a different insight into literature. Furthermore, the study discussed findings with the help of cross-sectional data which limits its significant implications in wide term. Therefore, the studies after this are recommended to collect longitudinal data which can help to better interpret the findings for wide applications. Working on these recommendations would be helpful for the future studies to contribute into the literature.

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CRedit Authorship Contribution Statement

Yang Laimi, Zahra Batool: Conceptualization, Data curation, Formal analysis, Funding acquisition. Yang Laimi: Investigation, Methodology, Project administration, Resources, Software. Zahra Batool: Supervision, Validation, Visualization. Writing – original draft. Yang Laimi, Zahra Batool: Writing – review & editing.

Declaration of Competing Interest

The authors declare no relevant financial or non-financial interests to disclose.

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Ethical Statement

This study adhered to ethical standards, and ethical approval was unnecessary as no human tissue or biological samples were used.

Data Availability Statement

The datasets generated and analyzed during this study can be obtained from the corresponding author on reasonable request.

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