

# The Effect of Digital Economy towards Students' Entrepreneurial Characteristics and Entrepreneurship as Career Choices: A Comparative Study

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**Abstract:** *The purpose of this paper is to identify the effects of digital economy on students' entrepreneurial characteristics and entrepreneurship as career choices, comparatively between Malaysia and Indonesia. A sample of students was randomly selected from public universities and private universities in each country. Confirmatory Factor Analysis (CFA), the foundation of structural equation modelling (SEM) has been used. The results evidenced that digital economy in both countries significantly influencing the entrepreneurial characteristics of the students. However, all four dimensions of digital economy in Indonesia significantly affecting the students' entrepreneurial traits, while only two dimensions are significant in Malaysia, i.e. social and cultural environment dimension and the consumer and business adoption dimension. Not only that, it is discovered that the university students in Malaysia are reluctant to become entrepreneurs in future despite the entrepreneurial characteristics the students possessed, contrarily with Indonesian university students. Therefore, both Malaysian and Indonesian governments need to keep on supporting the development of digital economy to encourage students to choose entrepreneurship as their careers in future. Plus, the lessons on entrepreneurship can be introduced as important subjects in universities in both countries.*

**Keywords:** Career Choices, Digital Economy, Entrepreneurial Characteristics, Indonesia, Malaysia

## 1. INTRODUCTION

The rapid growth in Information and Communication Technologies (ICT) is fundamentally changing the structures of the economy globally with growing speed, especially by providing an ocean of information (Schmid, 2001). A digital economy can be considered as an economy based on the digitization of information and the respective information and communication infrastructure, while the developments of the digital economy will have an elementary impact on economic systems and how economic values will be created (Zimmerman, 2000).

The ICT infrastructure supported the development of business and this can be

ascertained through the emergence of electronic commerce (e-commerce) to perform business transactions. The importance of e-commerce keeps increasing for every business to improve their competitiveness based on fact that time is extremely valuable. E-commerce would enable companies to connect with their trading partners for "just in time production" and "just in time delivery" (Ngai & Wat, 2002). Hence, the growth of e-commerce is vital in all countries including in the two neighbouring nations, Malaysia and Indonesia.

Apart from that, entrepreneurship is very crucial for the growth of economy of every country, especially for developing countries including Malaysia and Indonesia. This is because entrepreneurship considered to be an

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important mechanism for economic development through employment, innovation and welfare effects (Acs, Desai, & Hessels, 2008). Since entrepreneurs play vital role in the national economics, students which representing the younger generation, should be encouraged to become entrepreneurs in future. From the occupational view, synonyms for entrepreneurs are business owners, proprietors, and self-employed (Wennekers, Stel, Thurik, & Reynolds, 2005).

The importance of entrepreneurship as the career choices among the students is recognised by the Malaysian government through the belief in entrepreneurship education and training which will create enormous business opportunities and equip graduates with innovative enterprise skills (Mohamed, Rezai, Shamsudin, & Mahmud, 2012). The Indonesian government also enforce the higher education system to introduce the entrepreneurship as part of their academic curriculums based on the expectation that plenty of the innovative idea generation and start-up ventures will be arising from the universities.

Therefore, the purpose of the current study is to identify the relationship between the digital economy towards the entrepreneurial characteristics of the university students and the career choices among them, comparatively between Malaysia and Indonesia. Since the digital economy consists of four respective dimensions i.e. connectivity and ICT infrastructure, business environment, social and cultural environment, and consumer and business adoption, the specific objectives of the study are to examine the influence of the four dimensions of digital economy on entrepreneurial characteristics of the university students, and to investigate the effect of the students' entrepreneurial characteristics into entrepreneurship as career choices.

As the importance of entrepreneurship to the economic development of countries could not be denied, the findings of this study are crucial for Malaysian and Indonesian government since government involvement is needed to formulate strategies and take essential initiatives to support the growth of ICT and e-commerce, especially to increase the interests of teenagers to become credible entrepreneurs in future. As both Malaysia and Indonesia are Asian developing countries, plus both countries

are facing fast growth in e-commerce, it is worthwhile comparing the results of these two countries.

The rest of the paper is organized as follows. Section 2 includes a discussion on literature review regarding e-commerce. In section 3, the research framework of the study is included. While section 4 contains the research methodology of this study to explain on the way this research has been carried out. In section 5, the results from the hypothetical tests in both nations will be presented together with the discussions on the obtained results. In the later part of this paper, the conclusion of the study will be provided.

## 2. LITERATURE REVIEW

### 2.1. E-Commerce Definition

According to Ngai and Wat (2002), there is no universal accepted definition of e-commerce. However, there are several valid definitions of e-commerce from different perspectives according to Kalakota and Whinston (1997). For an example, e-commerce provides the capability of buying and selling products and information on the internet and other online services, from an online perspective (Kalakota & Whinston, 1997). While from business process perspective, e-commerce could be defined as the application of technology toward the automation of business transactions and workflow (Kalakota & Whinston, 1997).

### 2.2. E-Commerce in Malaysia

With regards to the e-commerce in Malaysia, the Malaysian legal environment has long been e-commerce friendly (Kamaruzaman, Handrich, & Sullivan, 2010). However, when compared to industries such as that of the United States, it could be said that Malaysia is lagged by about 3 to 5 years in e-commerce development, while the gap is getting smaller year by year showing that e-commerce's future in Malaysia seems to be bright (Kamaruzaman et al., 2010). However, there must be sufficient consumer trust and confidence for e-commerce's future to remain bright, and this is supported by a study which discovered one of the factors that influencing consumers' attitude towards e-commerce purchases through online shopping is e-commerce experience (Kamaruzaman et al., 2010; Jusoh & Ling, 2012).

Hence, businesses and government play important roles in the development of e-commerce in Malaysia. Interestingly, Malaysian small and medium-sized enterprises (SMEs) depend on government incentives, to provide adequate infrastructure for them to start doing business electronically (Mansor & Abidin, 2010). Meanwhile, Hashim & Noor (2014) found two important factors for SMEs in Malaysia to adopt e-commerce which is SME location, where SMEs need to be in a location with good public transportation services and efficient delivery methods, and the manager's experience of living abroad, to gain experience of buying and selling on the Internet. With the growing number of online shoppers and sales volumes in Malaysia, the examples of top e-commerce websites in the Malaysian attractive e-commerce market are Lazada, 11street, Lelong.my, Shopee, and Zalora (Aseanup.com, 2017).

### 2.3. E-commerce in Indonesia

Kurnia (2006) discovered a growth of e-commerce adoption in Indonesia. However, it is found that the cost of internet access is high and low Internet penetration in Indonesia caused by the low transmission speed capacity (Kurnia, 2006). Despite of that, the awareness of Indonesia's people towards the internet is increasing and this can be evidenced by a popular e-commerce sites in Indonesia named as Kaskus (Luthfihadi & Dhewanto, 2013). Originally, Kaskus is an online community forum for Indonesian people, but in its development the website becoming more popular since people can buy and sell anything they want without any charge (Luthfihadi & Dhewanto, 2013). Other than Kaskus, the examples of top e-commerce websites in Indonesia are Lazada, Traveloka, Zalora, and Rumah123.com (Fierdha, 2017).

There are various initiatives taken by Indonesian government in supporting the growth of ICT and e-commerce, such as improving telecommunication regulatory framework, developing awareness and educational campaign on ICT for government officers, developing measures to support SME's involvement in ICT and e-commerce, revising tax law to facilitate electronic transaction, facilitating the use of the internet

for teaching and learning, improving national backbone infrastructure, and developing local networks for underserved areas (Kurnia, 2006). A study by Rahayu and Day (2015) evidenced that perceived benefits, technology readiness, owners' innovativeness, owners' IT ability and owners' IT experience are the determinant factors that influence Indonesian SMEs in their adopting e-commerce.

### 3. RESEARCH FRAMEWORK

Fig. 1 illustrates the research framework suggesting the relationship between the four dimensions of digital economy towards entrepreneurial characteristics and entrepreneurial characteristics towards career choices.

Economist Intelligence Unit (2010) highlighted in its report that, the digital economy could be classified into four respective dimensions for clearer understanding. The first dimension is connectivity and technology infrastructure, which can be used to evaluate the extent to which individuals can access the internet and mobile networks. While the second dimension is the general business environment. The strength of the economy, political stability, taxation, stability, competition policy, the labour market, and openness to trade and investment, are among the indicators selected for the evaluation purpose (Economist Intelligence Unit, 2010).

In evaluating the next dimension, which is social and cultural environment, in order to be able to utilize internet services, education including the education infrastructure provided by the schools and government is a stipulation, together with technical skills indicated by familiarity with information technology (IT) applications, assessment of entrepreneurship, and the innovation levels (Economist Intelligence Unit, 2010). The fourth dimension which is consumer and business adoption, the Economist Intelligence Unit referred to the amount that businesses and consumers spend on accessing ICT services, the extent and range of internet features used by consumers, their online purchasing activity, and the use of online public services that have been made available by both consumer and business.

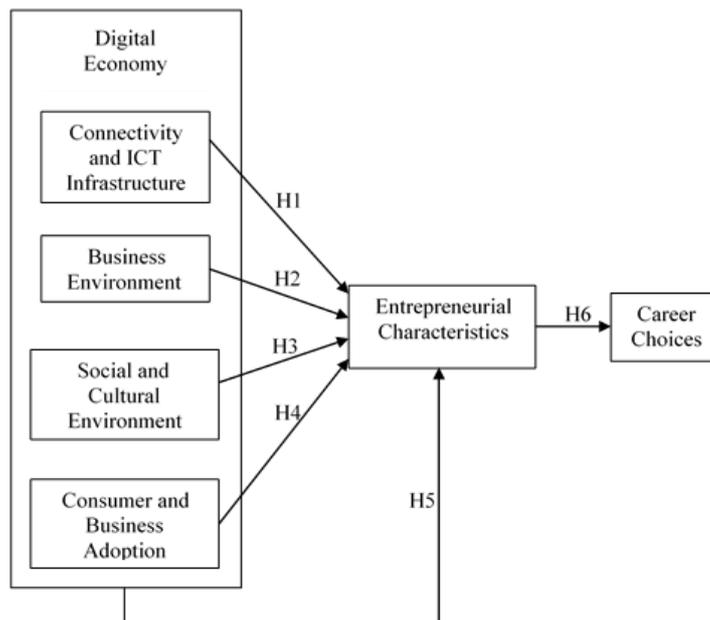


Fig. 1. Research Framework

According to Zimmerer, Scarborough, and Wilson (2005), there are eight entrepreneurial traits crucial for entrepreneurs. Every entrepreneur need to have these characteristics, namely desire for responsibility, preference for moderate risk, confidence in their ability to succeed, desire for immediate feedback, high level of energy, future orientation, skill at organizing, and value achievement over money. Further, Zimmerer et al. (2005) explained that entrepreneurs need to feel responsible for the business they start, are calculated risks takers, must be optimistic about their chance for success, are continuously looking for feedback on their ideas and business, more energetic than the average person, able to visualize business opportunities in the future, know how to gather the right team and resources, and care not only money, but also doing what seems impossible.

#### 4. RESEARCH METHODOLOGY

Malaysia and Indonesia are countries that are selected for this comparative study. A sample of students was randomly selected from public universities and private universities in each country. In Malaysia, from the 295 respondents, 152 students are from public universities while 143 students are from private universities. Whereas in Indonesia, 50 students from the 350 respondents are from national universities while 300 are from private universities. The questionnaire survey consisted of two sections, while the first section asking on the

demographic profiles of the respondents such as type of university, age, and gender. The next section concentrated on the research objectives to identify the entrepreneurial characteristics and career choices of the students. The questions are answered on a 5-point likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

Cronbach's alpha is used as a measure of the internal consistency reliability. The alpha coefficient is ranging from 0.00 to 1.00, and need to exceed 0.5 to show acceptable reliability (Nunnally, 1978). Referring to this study, the questionnaire could be considered as reliable since the coefficient values of alpha are greater than 0.5 for each variable.

Confirmatory Factor Analysis (CFA), which is the foundation of structural equation modeling (SEM) according to Brown (2015), has been used in this study to analyse the relationship between the latent variables included in the framework of the research. The significance degree of every coefficient that represents hypothesized causal relation must reach  $\alpha = 0.05$  and  $t\text{-value} \geq 1.96$  to show significant hypothetical relationships. The accuracy of the statistical model is justified by using the Goodness of Fit (GOF), based on the discrepancy value and to be more accurate, the sample approximation need to be large (Olivares & Forero, 2010). Table 1 shows the results for GOF testing in this research.

Table 1. Design Summary for Goodness for Fit Testing Model

GOF Indicator	Estimated Value	Malaysia		Indonesia	
		Testing Result	Conclusion	Testing Result	Conclusion
<i>Absolute Fit Value</i>					
GFI	GFI > 0.90	0.690	Marginal Fit	0.90	Good Fit
RMSEA	RMSEA < 0.08	0.158	Marginal Fit	0.048	Good Fit
<i>Incremental Fit Value</i>					
NNFI	NNFI > 0.90	0.668	Marginal Fit	0.98	Good Fit
NFI	NFI > 0.90	0.728	Marginal Fit	0.97	Good Fit
AGFI	AGFI > 0.90	0.570	Marginal Fit	0.89	Marginal Fit
RFI	RFI > 0.90	0.660	Marginal Fit	0.96	Good Fit
IFI	IFI > 0.90	0.752	Marginal Fit	0.98	Good Fit
CFI	CFI > 0.90	0.750	Marginal Fit	0.98	Good Fit

In order to measure the strength of relationship between the variables, Pearson's correlation coefficient analysis is used. The value of the correlation coefficient is ranking from -1 to 1 (Deborah, 2006). The positive and negative signs of the correlation coefficient indicate the direction of the relationship. From the result of the analysis, all the items have weak positive relationship with each other since all the

Pearson values are greater than 0.0 but below 0.5.

## 5. RESULTS AND DISCUSSIONS

The structural diagram in Fig. 2, Fig. 3, Fig. 4, and Fig. 5 shows the data analysis used to create the Structural Equation Model for Entrepreneurial Characteristics and Career Choices for both countries as follows:

### Structural Equations (Malaysia)

$$EC = 0.0103*ICT + 0.0370*BE + 0.0663*SCE + 0.662*CBA, \text{ Errorvar.} = 0.527, R^2 = 0.473$$

(0.0332)	(0.0424)	(0.0319)	(0.0493)	(0.0324)
0.309	0.873	2.079	13.434	16.273

$$CC = 0.184*EC + 0.0369*ICT + 0.232*BE + 0.370*SCE - 0.00190*CBA, \text{ Errorvar.} = 0.662, R^2 = 0.338$$

(0.102)	(0.128)	(0.143)	(0.0937)	(0.0761)	(0.136)
1.794	0.289	1.623	3.951	-0.0250	4.875

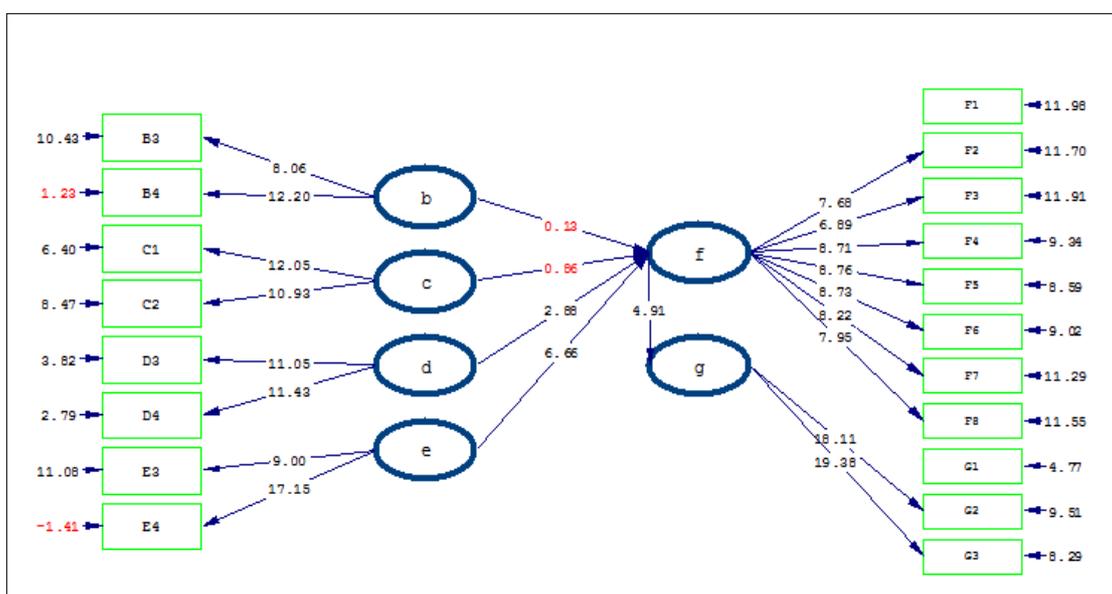


Fig. 2. Structural Diagram (T Value) for Malaysia

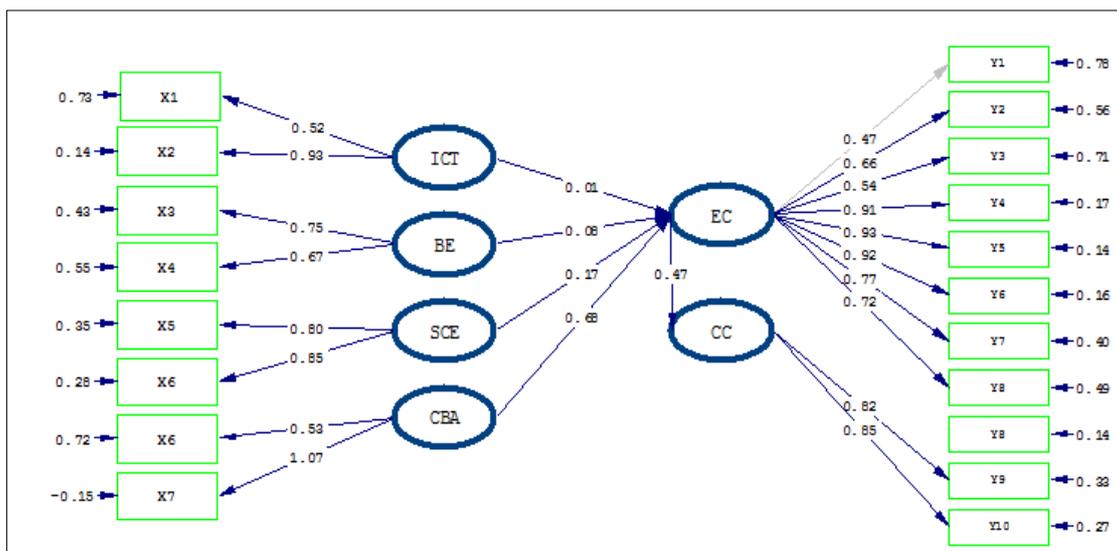


Fig. 3. Structural Diagram (Standardized) for Malaysia

Structural Equations (Indonesia)

$$EC = 0.39 \cdot ICT + 0.40 \cdot BE + 0.52 \cdot SCE + 0.48 \cdot CBA, \text{ Errorvar.} = 0.59, R^2 = 0.41$$

(0.045)	(0.067)	(0.058)	(0.053)	0.073
5.38	6.75	8.95	7.98	9.34

$$CC = 0.88 \cdot EC + 0.39 \cdot ICT + 0.40 \cdot BE + 0.52 \cdot SCE + 0.48 \cdot CBA, \text{ Errorvar.} = 0.63, R^2 = 0.57$$

(0.074)	(0.046)	(0.068)	(0.063)	(0.056)	0.043
11.21	6.83	8.74	7.98	7.65	10.06

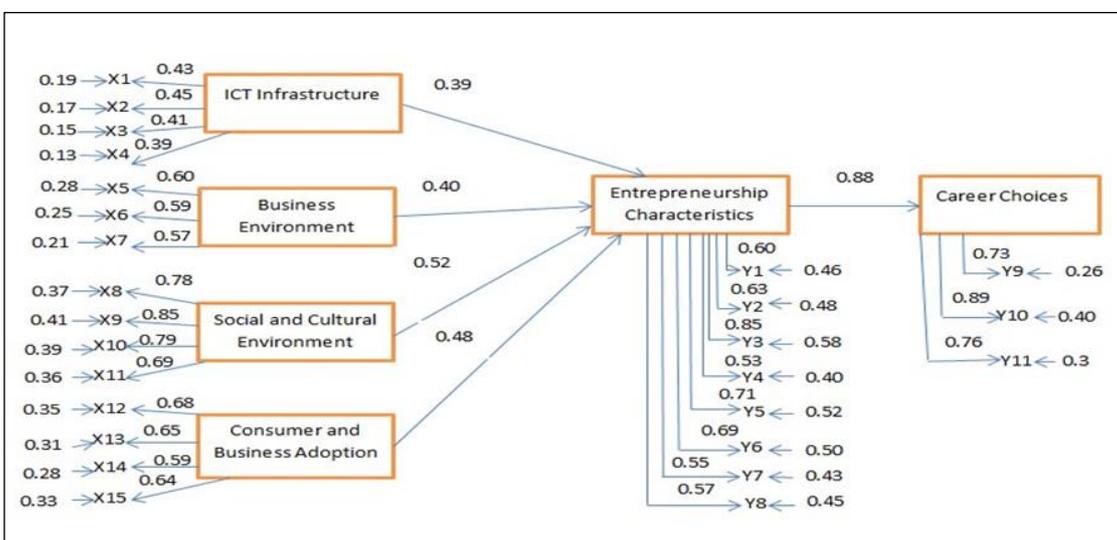


Fig. 4. Structural Diagram (T Value) for Indonesia

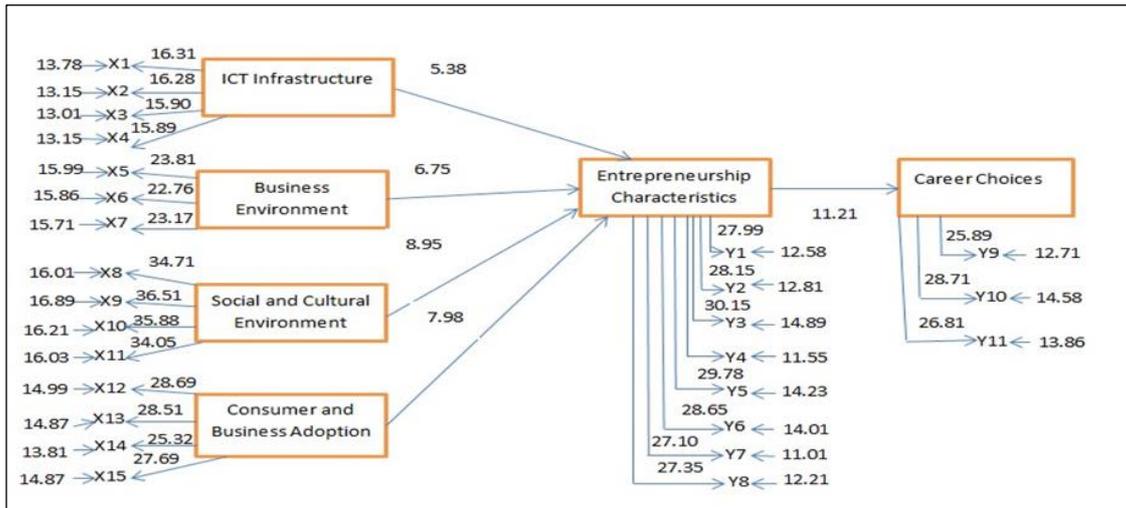


Fig. 5. Structural Diagram (Standardized) for Indonesia

The result for all hypothetical tests in Malaysia indicates that some of the hypotheses are supported by data, while some are not. On the other hand, the result in Indonesia shows that

all hypotheses tested are supported by data. Table 2 shows the results of the hypotheses testing.

Table 2: Results of Hypotheses Testing

Malaysia	Indonesia
<b>H1: There is no significant effect between connectivity and ICT infrastructure into entrepreneurial characteristics of the university students.</b> This is because the $t$ -value is $< 2$ ( $0.309 < 2$ ), with the rate of effect of only 0.01.	<b>H1: There is a significant effect between connectivity and ICT infrastructure into the entrepreneurial characteristics of the university students.</b> This is because the $t$ -value is $> 2$ ( $5.38 > 2$ ), with the rate of effect of 0.39.
<b>H2: There is no significant effect between business environment into entrepreneurial characteristics of the university students.</b> This is because the $t$ -value is $< 2$ ( $0.873 < 2$ ), with the rate of effect of only 0.08.	<b>H2: There is a significant effect between business environment into entrepreneurial characteristics of the university students.</b> This is because the $t$ -value is $> 2$ ( $6.75 > 2$ ), with the rate of effect of 0.40.
<b>H3: There is a significant effect between social and cultural environment into entrepreneurial characteristics of the university students.</b> This is due to the $t$ -value $> 2$ ( $2.079 > 2$ ), while the rate of effect of 0.17 shows that the social and cultural environment dimension has the second highest effect into entrepreneurial characteristics.	<b>H3: There is a significant effect between social and cultural environment into entrepreneurial characteristics of the university students.</b> This is due to the $t$ -value $> 2$ ( $8.95 > 2$ ). Since the rate of effect is 0.52, it is shown that social and cultural environment dimension has the greatest effect into entrepreneurial characteristics among all the four dimensions.
<b>H4: There is a significant effect between consumer and business adoption into entrepreneurial characteristics of the university students.</b> This is reflected by the $t$ -value $> 2$ ( $13.434 > 2$ ). With the contribution rate of 68%, consumer and business adoption has the greatest effect among all the four dimensions.	<b>H4: There is a significant effect between consumer and business adoption into the entrepreneurial characteristics of the university students.</b> This is reflected by the $t$ -value $> 2$ ( $7.98 > 2$ ). With the contribution rate of 48%, consumer and business adoption process is the second highest dimension in affecting the entrepreneurial characteristics among the university students.
<b>H5: There is a significant effect between all dimensions of Malaysia's digital economy into entrepreneurial characteristics of the university students.</b> This is proved by the $t$ -value $> 2$ ( $16.273 > 2$ ), while the contribution rate of 32% evidenced that the four dimensions have powerful effect into entrepreneurial characteristics when taken together.	<b>H5: There is a significant effect between all dimension of Indonesia's digital economy into the entrepreneurial characteristics of the university students.</b> This is proved by the $t$ -value $> 2$ ( $9.34 > 2$ ), while the contribution rate of 73% evidenced that the four dimensions have powerful effect into entrepreneurial characteristics when taken together.
<b>H6: There is no significant effect between entrepreneurial characteristics into career choices.</b> This is because the $t$ -value is $< 2$ ( $1.794 < 2$ ), with the contribution rate of 47%.	<b>H6: There is a significant effect between entrepreneurial characteristics into career choices.</b> This is because the $t$ -value is $> 2$ ( $11.21 > 2$ ), with the contribution rate of 88%.

Based on the result, H5 to be specific, when the four dimensions of digital economy aggregated into a single measure, it is proven that its effect into entrepreneurial characteristics is significant for both countries. However, the effect of the digital economy towards the students' entrepreneurial characteristics in Indonesia is greater compared to in Malaysia since the contribution rate is 73% in Indonesia compared to only 32% in Malaysia. The underlying reason could be due to only two dimensions of digital economy in Malaysia found to be significantly affecting the entrepreneurial characteristics of the students, while all four dimensions of digital economy in Indonesia significantly affecting the students' entrepreneurial characteristics. The result in Indonesia supported by previous study by Hussain, Afzal, Asif, Ahmad, and Bilal (2011) which revealed that innovation, technology, and economic growth give significant impact on entrepreneurial activities.

In Malaysia, only social and cultural environment dimension and consumer and business adoption dimension are significantly affecting the entrepreneurial characteristics of the university students, while connectivity and ICT infrastructure dimension and business environment dimension bring no significant impact. Among the four dimensions of digital economy in Malaysia, it is found that consumer and business adoption has the greatest effect on the students' entrepreneurial traits. This is in line with the findings from previous study which identified that the rate of internet users in Malaysia is increasing, as well as the rate of online spending and new technologies adoption (Jehangir, Dominic & Khan, 2011).

Meanwhile in Indonesia, the dimension of digital economy that give the highest effect towards the students' entrepreneurial characteristics is the social and cultural environment. This data supported by a study done by Cordova (2013) who highlighted that environment is vital for entrepreneurial success. Apart from that, the interest in entrepreneurship found to be motivated through culture, family, and friend business (Hussain et al., 2011).

Differently in Malaysia, the social and cultural environment dimension give the second highest effect on the entrepreneurial characteristics of the students. This is

supported by Mohamad, Lim, Yusof, and Soon (2015) where they discovered that entrepreneurship can be cultivated through education, whether through formal education such as through entrepreneurship degree and entrepreneurial programs, or informal entrepreneurship education such as running own business. Muharam and Serah (2014) also found that entrepreneurship education is the recognized key factor to enhance the students' desirability of self-employment. While the second highest dimension affecting the entrepreneurial traits of the students in Indonesia is the consumer and business adoption, and this is highlighted by Penambunan-Ferse and Breiter (2013), where they agreed that the number of ICT devices users, specifically cell phone, is increasing very fast in Indonesia.

Another dimension that found to be significantly affecting the students' entrepreneurial characteristics in Indonesia, but not significant in Malaysia, is connectivity and ICT infrastructure dimension. This is supported by Audrestsch, Heger, and Veith (2015), where they stated that the ICT infrastructure will create more recognition of entrepreneurial opportunities. However, this situation is not supported in Malaysia based on the result. Business environment dimension, is another dimension of digital economy that give significant impact to the entrepreneurial traits of the students only in Indonesia. Cordova (2013) stated that business environment in Indonesia are growing abundantly, therefore affecting the entrepreneurial personality of the students.

Lastly, the result discovered that the entrepreneurial characteristics of the students in Malaysia have no significant effect into entrepreneurship as career choices among them. They do not choose to become an entrepreneur in future, but consider working in private or public sectors even though the students are possessing the entrepreneurial traits. This is due to the reasons that the interest of a person for an entrepreneurial career relies on other factors as well such as opinions, perceptions of risks and rewards, parental support, motivation, values, the environment and attitudes towards self-employment and entrepreneurship, not only on entrepreneurial characteristics (Ilouga, Mouloungui, & Sahut, 2014).

In contrast, the entrepreneurial traits of students in Indonesia significantly affect their choices to become entrepreneurs in future. This is supported by Zhao, Seibert, and Hills (2005) which asserted that individual's confidence in his or her ability to successfully perform entrepreneurial roles and tasks, or known as self-efficacy, positively related to students' intentions to start their own business. Moralista and Delariante (2014) also highlighted that creativity, which mainly considered in entrepreneurial self-efficacy, lead to students' entrepreneurial intentions.

## 6. CONCLUSION

The results evidenced that the digital economy in both countries significantly affecting the entrepreneurial characteristics of the students, which therefore increasing the importance of the role of both Malaysian government and Indonesian government to keep on supporting the development of digital economy in the country, by focusing on each dimension, especially the social and cultural environment dimension and the consumer and business adoption dimension. Consequently, students, which representing the younger generation, will be able to absorb and use ICT for economic and social benefit in future, which will contribute to the rapid growth of the economy of both countries since the growth of digital economy is important for businesses to remain competitive.

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However, it is discovered that the university students in Malaysia reluctant to become an entrepreneur in future despite the entrepreneurial traits the students possessed, contrarily with Indonesian university students. Therefore, the higher institution of learning in Malaysia need to provide more educational support to increase the students' understanding level on entrepreneurship, which consequently increase their interests to opt entrepreneurs as their future career. Othman, Hashim, and Wahid (2012) also discovered that the readiness for entrepreneurship education within the internal environment of public universities remains insufficient and requires improvements, even though the results of their research indicate that Malaysian students' entrepreneurial willingness and capabilities are strong.

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