Macrothink Institute™

Business Management and Strategy
ISSN 2157-6068
2022, Vol. 13, No. 1

The Relationship between Information and Communication Technology (ICT) Self-efficacy and Technopreneurial Intention

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Received: March 10, 2022 Accepted: April 24, 2022 Published: April 28, 2022

doi:10.5296/bms.v13i1.19806 URL: https://doi.org/10.5296/bms.v13i1.19806

Abstract

As a developing country, Malaysia needs to develop a greater number of technology-savvy entrepreneurs to encounter the challenges of COVID19 and fourth industrial revolution (IR 4.0). However, the number of young technology-based entrepreneurs in Malaysia is still low. Moreover, not many studies have been done to identify the motivating factors of

technology-based entrepreneurship. As such, this study was carried out to identify the influence of information and communication technology (ICT) self-efficacy on technopreneurial intention. A total of 152 students from a Malaysian public university was surveyed through self-administered questionnaire. Multiple regressions analysis was performed to test the hypotheses. The results revealed that three variables, namely Internet general ability, confidence in using computer and competency in using computer significantly influenced technopreneurial intention. Meanwhile, communicative ability did not have any significant relationship with technopreneurial intention. Generally, the findings supported previous studies that ICT self-efficacy played a role in determining an individual's technopreneurial intention. Specifically, proficiency in computer skills and mastery of Internet general ability should be stressed. As technology-based entrepreneurship continues to play a crucial role in post-COVID19 era, it is important to develop more young and competitive technopreneurs. Thus, this study suggested that government should accentuate science, technology, engineering and mathematics (STEM) education; while education providers should continue to offer ICT courses to the students in order to bolster the development of technopreneurship in the country.

Keywords: entrepreneurship, intention, self-efficacy, students, technology

1. Introduction

One of the new changes in business brought by COVID19 is the application of technology in business activities. Specifially, BDO (2020) pointed out that digital transformation was a necessary move to stay in business due to the widespread of COVID19. True, examples of digital trends in business included remote work from home, e-commerce, digitization of customer service, contactless delivery, use of online platforms etc (BDO, 2020). Many businesses have also planned to increase their expenditures on new information technology (IT) projects and digital transformation. For instance, 70% of U.K. companies were expected to increase their IT spending in 2021; with 69% planned to implement new digital projects, tools or initiatives, while 65% intended to invest in new field of technology (Coleman, 2021). In addition, a report released by Global Entrepreneurship Monitor (GEM) (2022) also revealed that new entrepreneurs expressed that they expected using more digital technologies in their business. It is a fact that integrating technology in business has become a crucial strategy in maintaining business survival in today's business world.

As for new business start-ups, the COVID19 pandemic has caused starting a business more difficult than before around the world (GEM, 2022). As reported, entrepreneurs in 33 out of 46 economies agreed that pandemic has made starting a business difficult in 2020; however, such agreement was less emphatic in 2021, whereby entrepreneurs in 18 out of 47 economies agreed with that condition (GEM, 2022). Although the number of economies expressing difficulties in starting new business have decreased, the challenges still remained. For example, Organisation for Economic Co-operation and Development (OECD) reported that new firm creation in France dropped by 25% in March 2020 and the number of new business registration would generally decline. Notwithstanding the disruptions and the declining

number of new start-ups caused by COVID19, there were new opportunities for new start-ups during the period of crisis (OECD, 2020). Indeed, starting a new business could remained difficult but entrepreneurs agreed that the pandemic has led to new business opportunities (GEM, 2022).

Based on the above discussions, integrating technology in today's business activities is crucial. Furthermore, there are viable business opportunities in times of COVID19. As such, investigating the development of technopreneurship prevails. Technopreneurship is a sub-field of entrepreneurship. It emphasizes on combining technology and entrepreneurial skills of a person (Suradi, Yasin & Rasul, 2017). It also plays an important role in encountering challenges of the fourth industrial revolution (IR 4.0), which emphasizes on use of technology in business, especially information and communication technology (ICT). In Malaysia, ICT is not something alien to most university students because they are exposed to ICT knowledge since primary school. Meanwhile, entrepreneurship has been offered as a compulsory or elective course in all higher learning institutions. It can be said that vast majority of Malaysian undergraduates are equipped with certain level of ICT and entrepreneurial knowledge and capabilities.

In addition to providing ICT and entrepreneurship knowledge to youths, Malaysian higher learning institutions are also encouraged to offer various entrepreneurship programs and provide supporting environment to produce young entrepreneurs and new business start-ups (Din, Aziz, Anuar & Usman, 2017). It is believed that younger individuals were more likely to start a business than the older people (GEM, 2022). Furthermore, the development of technopreneurship requires a pool of young, competitive and innovative young individuals. Technology-based business is undoubtedly the future trend of business world, unfortunately not many youths are interested to get involved with technopreneurship. Moreover, the number of youths embarked on entrepreneurship is still low in the country (Ha, Ling, Muniapan & Gregory, 2013; Bernama, 2017). The low participation of youths in entrepreneurship, especially on technology-based entrepreneurship would hamper the country's vision in becoming a developed country. This phenomenon signals that there is a need to further scrutinize youth's motivation to embark on entrepreneurship.

There is abundance of research papers on general entrepreneurship and entrepreneurial intention. However, the extant literature about technopreneurship is still rather limited. Specifically, there is a lack of research about motivation or intention to take up technopreneurship. Therefore, this study was conducted to fill the gaps by examining the extent of ICT self-efficacy in influencing technopreneurial intention among young students.

2. Literature Review

2.1 Technopreneurship

Technopreneurship or also known as technology-based entrepreneurship is a term under the umbrella of entrepreneurship. It combines both technology ability and entrepreneurial skills of a person or simply merging of modern technology and entrepreneurship (Suradi et al.,

2017). People who take up technopreneurship is known as technopreneurs; they are also risk-takers who developed new businesses from technology (Nacu & Avasilcăi, 2014). In today's business world, technopreneurs are playing an important role in shaping a country's competitive advantages. Moreover, they could be considered as an important type of entrepreneurs in post-COVID19 pandemic era because of their ability in applying digital technology and IT in business operations. Although technopreneurship is crucial to a country, Malaysia is still lacking in technopreneurship development as compared to U.S. and European regions (Suradi et al., 2017; Colombo & Delmastro, 2001). It is worth to note that the slowness in technopreneurship development would affect the country's aspiration in becoming a developed country, facing the challenges of IR 4.0 and being competitive in post-COVID19 pandemic era. Therefore, development of technopreneurship requires further investigation.

Similar to conventional entrepreneurs, a person would not become a technopreneur without any stimulations. Entrepreneurial intention could be deemed as a reliable stimulant for entrepreneurial behavior (Ajzen, 1991). True, people become entrepreneurs because of influence from various situational factors and perceptions (Shapero & Sokol, 1982). Since technopreneurship is categorized under the umbrella of entrepreneurship, it is believed that people exhibit technopreneurial intention before he or she takes up any technopreneurial behavior.

2.2 Information and Communication Technology (ICT) Self-efficacy

As discussed in the previous section, technopreneurial intention could be regarded as a predictor for technopreneurial behavior. As Ajzen (1991) further pointed out, intention was influenced by one's attitude, social norms and perceived behavioral control (PBC). Researchers have further showed that PBC was equivalent to self-efficacy (Fishbein & Cappella, 2006). According to Bandura (1986), self-efficacy can be described as "people's judgments of their capabilities to organize and execute courses of action required attaining designated types of performances (p 391)".

It is worth mentioning that education or training courses are important sources of obtaining capabilities. Contents that one obtained from education courses are crucial in developing future entrepreneurs among the students (do Paço, Ferreira, Raposo, Rodrigues & Dinis, 2011). In current literature, researchers have proven that entrepreneurial intention was influenced by knowledge, skills or abilities that a person had (Farashah, 2013; Lucky & Ibrahim, 2015). Therefore, ICT self-efficacy can be considered as an important factor in determining entrepreneurial intention. Specifically, types of ICT-related knowledge and skills to be transferred to students in developing future entrepreneurs requires further scrutiny.

University students who have attended ICT courses during their schooling time are deemed to possess various ICT knowledge and capabilities such as using computer and the Internet to complete tasks. It is believed that university students are having the capabilities in performing computer- and Internet related tasks (Fraillon, Ainley, Schulz, Friedman & Gebhardt, 2015). As such, ICT self-efficacy could be made up from computer self-efficacy and Internet self-efficacy (Papastergiou, 2010).

Computer is a must-have and must-use tool in the current business world; especially for technopreneurs in facing challenges from IR 4.0. Computer self-efficacy can be explained as a person's own judgement on his or her competency in utilizing various computer applications (Albashrawi and Alashoor, 2017). Ability to use computer has found to have a positive influence on entrepreneurial intention (Sitaridis & Kitsios, 2019); meanwhile, Internet is a useful tool to survive in the IR 4.0 era. Internet self-efficacy is the belief that a person is able to utilize functions of Internet (Hsu & Chiu, 2004). Internet plays a vital role in the development of electronic entrepreneurs or entrepreneurs who runs an online business (Balachandran & Sakthivelan, 2013).

Although previous studies have agreed that individual's capabilities influenced a person's intention to become entrepreneur (Sánchez, 2011); a contradicting result was found in which entrepreneurial education had less impact on Norwegian graduates' interest to start own businesses (Støren, 2014). This has suggested that the influence of individual's capabilities on entrepreneurial intention requires further examination.

2.3 Research Model and Hypotheses Development

Discussion in Section 2.2 highlighted that ICT self-efficacy comprised of computer self-efficacy and Internet self-efficacy. Both of them are deemed to have positive influence on technopreneurial intention. As such, Figure 1 shows the research model. This study has also developed the following hypotheses to guide the study:

H1: Competency in using computer positively influenced technopreneurial intention.

H2: Confidence in using computer positively influenced technopreneurial intention.

H3: Internet general ability positively influenced technopreneurial intention.

H4: Communicative ability positively influenced technopreneurial intention.

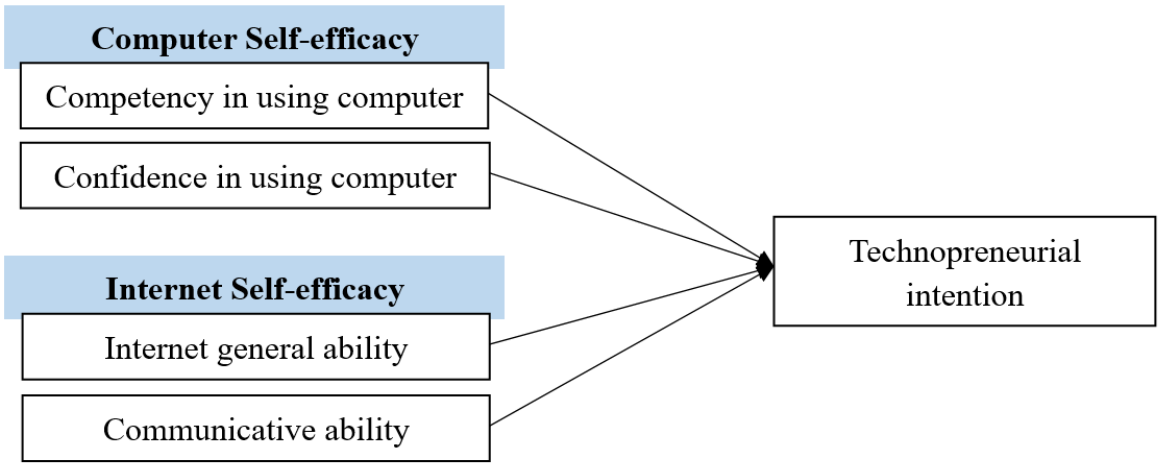

Figure 1. Research model

3. Methodology

3.1 Research Design

This study employed quantitative method; specifically, it used questionnaire survey. It was deemed appropriate because all the variables were quantifiable. As this study aimed to examine the individual's technopreneurial intention, the unit of analysis was individual undergraduate students. Single cross-sectional time frame was adopted because data was collected once throughout the study time frame.

The population of this study comprised of final year students from a public university in Malaysia. The university was selected because it is the university with the largest number of students in the country. As for the sample selection, this study employed proportionate stratified sampling. The population was stratified in accordance with the three main campuses in Klang Valley, Malaysia. The sample selected for this study was 152 students.

3.2 Research Instrument

This study used questionnaire to collect the data. It consisted of three sections and 33 items. Section A was about respondent's background information. Section B was related to competency in using computer (nine items), confidence in using computer (six items), Internet general ability (seven items) and communicative ability (five items). Meanwhile, Section C consisted six items pertaining to technopreneurial intention. All items were adapted from previous studies such as Aesaert, Voogt, Kuiper and van Braak (2017), Hatlevik, Throndsen, Loi and Gudmundsdottir (2018), Wu and Tsai (2006) and, Liñán and Chen (2009) to ensure their reliability and validity. Respondents were asked to rate on a seven-point scale for each item, ranging from 1-strongly disagree to 7-strongly agree.

3.3 Pilot Test

A pilot test was performed to ensure that the questionnaire was free from errors prior to the mass distribution of questionnaire. Based on the test performed, five items were corrected because of grammatical and spelling errors. The reliability of items for each variable was well above the threshold of 0.70 (Pallant, 2016).

4. Results

4.1 Descriptive Statistics

Majority of the undergraduate students who took part in this study were female (65.13%; n=99). About 24.34% (n=37) of the respondents were from Faculty of Business and Management. About half of them responded that none of their family members owned a business (54.61%; n=83). More than half of them lived in urban area (65.13%; n=99), received financial assistance for schooling (57.89%; n=88) and had friends who were doing businesses (66.45%; n=101). Interestingly, a vast majority of them stated that they possessed e-commerce experience (87.50%; n=133).

4.2 Reliability, Mean and Pearson Correlation

Cronbach's alpha coefficient (α) was used to determine the internal consistency of items for each variable. The results showed that items for all variables were reliable because the α values were above 0.80 (Table 1). The descriptive analysis in Table 1 also depicted that respondents rated highest on Internet general ability (m=6.13) while lowest on technopreneurial intention (m=4.60).

Table 1. Reliability, mean and correlation

	α	m	CP	CF	IA	CA	INT
CP	0.88	5.43	1.00				
CF	0.89	6.00	0.78**	1.00			
IA	0.92	6.13	0.62**	0.80**	1.00		
CA	0.89	5.82	0.42**	0.55**	0.51**	1.00	
INT	0.93	4.60	0.33**	0.26**	0.23**	0.27**	1.00

Note. CP: Competency in using computer; CF: Confidence in using computer; IA: Internet general ability; CA: Communicative ability; INT: Technopreneurial intention

Pearson product moment correlation analysis was performed to determine the association between pairs of variables in this study. Table I illustrates that all pairs of variables recorded positive and significant associations. The highest correlation coefficient (r) was found between confidence in using computer and Internet general ability (r=0.80); while the lowest was recorded between Internet general ability and technopreneurial intention (r=0.23). The results also confirmed that multicollinearity issues did not exist because overly high value of r (>0.90) was not found (Pallant, 2016). Results from Pearson correlation denoted that multiple regressions analysis was deemed appropriate.

4.3 Multiple Regressions Analysis

In order to test the four hypotheses developed in this study, multiple regressions analysis (Table 2) was performed. It was deemed appropriate because it could determine the influence of independent variables on dependent variable. As found in Pearson correlation, multicollinearity was not an issue and it was again proven by large tolerance values (>0.10) and small VIF values (<10) (Pallant, 2016).

Results in Table 2 also indicate that the four independent variables significantly explained the dependent variable (F-stat.=14.07; sig.<0.01). The R^2 of 0.36 implies that 36% of variation in

technopreneurial intention was explained by variation in competency in using computer, confidence in using computer, Internet general ability and communicative ability. Three variables, namely Internet general ability (β=0.53; sig.<0.01), confidence in using computer (β=0.41; sig.=0.02) and competency in using computer (β=0.33; sig.=0.03) significantly influenced technopreneurial intention. Meanwhile, communicative ability (β=0.18; sig.=0.09) did not influence technopreneurial intention significantly. Therefore, H1, H2 and H3 were supported while H4 was not supported.

Table 2. Regression analysis

Variable	Std. β	t	Sig.	Tolerance	VIF
CP	0.33	2.27	0.03	0.39	2.57
CF	0.41	3.57	0.02	0.21	4.59
IA	0.53	5.56	<0.01	0.36	2.79
CA	0.18	1.69	0.09	0.68	1.46
F-stat	14.07 (Sig. <0.01)				
R-squared	0.36				

Note. Dependent Variable: INT – Technopreneurial intention

CP: Competency in using computer; CF: Confidence in using computer; IA: Internet general ability; CA: Communicative ability; INT: Technopreneurial intention

4.4 Discussion

This study found that two elements of computer self-efficacy, namely competency in using computer and confidence in using computer positively and significantly influenced technopreneurial intention. The results supported that a person's computer capabilities influenced his or her entrepreneurial intention (Sitaridis & Kitsios, 2019). Indeed, Malaysian students started to learn and use computer as early as in primary school times. They continue to gain computer knowledge when they proceed to secondary school. Then, most universities offer computer courses as core or compulsory courses to undergraduates. Thus, it can be said that Malaysian students are well-equipped with computer knowledge and possess good ability in using computer. In addition, undergraduate students nowadays are required to complete their assignments by using computer, it is not surprising that they have high confidence in using computer. Furthermore, the online-learning experience during the COVID19 pandemic period under the various types of Movement Control Orders (MCOs) implemented by

Malaysian government has also helped them to excel in ICT knowledge and applications. Since they are well-versed in using computer, they could easily gain various benefits through utilization of computer equipment, including identifying technology-based business ideas, handling business activities and solving business problems. Technopreneurship is closed-related to the use of computers, it is understandable that students who are good in computer would show higher intention towards technopreneurship.

As for relationship between Internet self-efficacy and technopreneurial intention, this study obtained some interesting results. In terms of Internet self-efficacy, it found that Internet general ability, but not communicative ability, positively and significantly influenced technopreneurial intention. In fact, Internet general ability was the most important factor which influenced technoporeneurial intention. It included ability such as surfing the Web, searching, downloading and sharing needed information. It is the basic ability that a person should have when he or she wishes to set-up a technology-based business. Young students are usually good new technology adopters and users. In addition, Internet ability could also be considered as a must-have ability for online learning in the times of COVID19 pandemic. Therefore, it is clear that respondents in this study agreed with Internet general ability helped them to have technopreneurial intention. As for non-significant relationship between communicative ability and technopreneurial intention, perhaps the respondents in this study were young university students. Therefore, they normally communicated with their fellow friends or course mates who were at about their age. When it came to topics of communication, they might also be mostly about studies, assignments or maybe gossips. Students might not realize that communicative ability could actually help them to learn new entrepreneurial knowledge, identify new business opportunity and further develop interest in entrepreneurship.

5. Conclusion

This study aimed to identify the influence of ICT self-efficacy on technopreneurial intention. It could be concluded that computer self-efficacy and Internet general ability were crucial in fostering technopreneurial intention. It is without any doubts that technopreneurs are playing a prominent role in both post-COVID19 pandemic and IR4.0 eras. Therefore, in order to develop competitive technopreneurs, we should ensure that people possess competency and confidence in using computer as well as ability to utilize Internet.

Literary, this study has enriched the entrepreneurship literature by examining the relationship between ICT self-efficacy and technopreneurial intention. Practically, it provides new insight on importance of ICT self-efficacy in technopreneurship development. As the world is gradually recovering from the strike of COVID19 pandemic, and people are getting used to the new normals of using technology in business; technopreneurship is crucial in developing competitiveness of a country, not only during COVID19 pandemic era but also post pandemic times. Thus, to encourage more individuals to embark on technopreneurship, both government and education providers have their roles to play. Government should focus on science, technology, engineering and mathematics (STEM) development in the country's education system. As for schools and universities, they should continue to offer ICT courses

to students of all ages. Academic curriculum should stress on improving students' proficiency in computer skills. In terms of mastery of Internet knowledge, general Internet ability, such as surfing, information searching and sharing should be emphasized.

One of the limitations of this study is that it only surveyed undergraduate students from a public university. In addition, it only considered computer and Internet self-efficacy; however, intention to become a technopreneur could be sparked by some other external variables, such as economic conditions, support from government and subjective norms. Thus, future research are urged to extend the sample to students from other universities and expand the research model to include other external factors.

Acknowledgment

The authors would like to thank Universiti Teknologi MARA, Cawangan Melaka for funding this research project under the Skim Geran Dalaman TEJA 2022 [GDT2022/1-13].

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