

THE ROLE OF ENTREPRENEURIAL SPIRIT AND SELF-EFFICACY IN TECHNOLOGY ENTREPRENEUR NEW VENTURE CREATION

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ABSTRACT

Technology entrepreneur new venture creation (TENVC) plays an important role in developing and commercializing technologies worldwide. Yet, one of the critical and on-going debates is about the paradigm shift from the trait approach to the behavioral approach which emerges from what successful entrepreneurs do and how they perform, rather than what their personality traits are. Therefore, the purpose of this research was to study both the entrepreneurial spirit and self-efficacy as key factors for TENVC. The mixed methods research was employed by combining the quantitative and qualitative approaches. The samples were chosen based on convenience sampling for the quantitative study and judgment sampling for the qualitative study. The finding shows that both entrepreneurial spirit and self-efficacy are correspondingly important for TENVC among technical students and Institutes of Higher Learning (IHLs). There is only a small difference in value in their positive significant relationship led by self-efficacy compared to entrepreneurial spirit with $r=.005$ for TENVC of technical students in IHLs. This finding is convergent with the outcome of the case study analysis that both factors are among the key indicators for TENVC of technical students in IHLs. The technology entrepreneur development organizations (TEDO) may utilize this result in developing TENVC in their institutions.

Keywords: *Entrepreneurship, technology entrepreneurship, technology entrepreneur new venture creation, technical student, young technical graduate.*

Background of the Research Context

In general, the trait approach is based on the principle that entrepreneurs are different from non-entrepreneurs. Brockhaus

(1982), Carland et al. (1984), and Milner (1990) have all searched for the elusive personality-based approach which focuses on the personality of the entrepreneur. Entrepreneurial spirit has been previously discussed by many researchers as part of a personal trait and a gift that inspires people with passion, positivity, leadership and ambition to become the best they can be (Pierce, 2008). According to Hatch and Zweig (2000), entrepreneurial spirit is the embodiment of a collection of personal traits. Indeed, some traits were more predominant in some individuals than in others. They propelled or motivated individuals to incur great personal risk, abandon their jobs and start their own businesses, and encouraged self-pride and recognition for each individual's contribution to a corporate end product (Lima et al., 2015; Gatty, 2013; Uddin & Bose, 2012).

Accordingly, the behavioral approach has adopted by Gartner (1989), Timmons and Spinelli (2009), and Kuratko and Hodgetts (2006) in the study of the entrepreneurial process and the activities of the entrepreneur. Southon and West (2005), defined entrepreneurs as very special people, who are born optimist, confident, charismatic, ambitious, obsessed with work, in a hurry and have bags of energy. This definition relates the principle that self-efficacy is a capacity and belief in one's ability to successfully perform a particular behavior or task (Cassidy and Eachus, 1998). Bandura (1994) defines self-efficacy as a belief in one's capabilities to organize and execute the course of action required to attain a goal as well as possessing capabilities to produce designated levels of performance that exercise influence over events that affect their lives. A person with high self-efficacy is more willing to expend effort, choose to perform more challenging tasks and show more persistence in the face of obstacles (Bandura, 1997). Boyd and Vozikiss (1994) argue that self-efficacy is an important explanatory variable that determines both the strength of entrepreneurial intentions as well as the likelihood that those intentions will translate into entrepreneurial actions.

Hence, similar to the born or made debate regarding entrepreneurs, the driving force issues concerning the trait or behavioral approach as the key factors for TENV also have become one of the critical and on-going debates among researchers in the entrepreneurship area. Therefore, the purpose of this research was to study both the entrepreneurial spirit and self-efficacy as key factors for TENV. This purpose was supported by two main objectives, i.e. to study the importance of both trait factors, i.e. entrepreneurial spirit and behavioral factors, i.e. self-efficacy to the TENV of young technical graduates (YTG).

The two (2) research hypotheses in this study were:

H1: Entrepreneurial spirit is more likely to influence the TENVC among technical students.

H2: Self-efficacy is more likely to influence the TENVC among technical students.

The research was analyzed based on respondents' perceptions. The study was conducted among undergraduate technical students (UGTS), young technical graduates (YTG), and key informants of TEDO from IHLs and venture capitalists.

Research Methodology

The mixed method strategy was used to meet the objectives of the study. Several data collection methods used for the research included; (a) questionnaires survey, (b) semi structure interviews; and (c) documentation reviews. By using the mixed method research strategy, the researchers moved from blending the theoretical and empirical study to a quantitative and qualitative study. The rationale for adopting the mixed strategy was that its instruments can sharpen the clarity of results, strengthen the validity of findings, and enhance the credibility of conclusions (Berg, 2007; Bogdan, 2007; Golafshani, 2003; Paulien, Nico, and Douwe, 2002; Johnson and Gill, 1991), and also improve the ability of researchers to draw conclusions from the studies which might result in a more robust and generalizable set of findings (Jack and Raturi, 2006). In terms of data collection tools, the researchers practised the common instrument used by previous researchers which were: questionnaire survey, interviews and documentation reviews. The samples were chosen based on convenience sampling for the quantitative study, i.e. UGTS and YTG; and judgment sampling for the qualitative study, i.e. TEDO key informants and venture capitalist.

This research was conducted in three stages. The first stage involved informal interviews and literature review to develop the problem statement, research objective, hypothesis and sample selection. In the second stage, direct distribution of the questionnaire survey and electronic questionnaire survey (EQS) methods were used. After the pilot test and modification, the final questionnaire surveys were developed in MS Words for direct distribution and in the "SurveyShare" software for the EQS. In the third stage,

semi-structured interviews were adopted to provide depth to the research study. After completing the in-depth interview analysis, the researcher also used on the documentation review method especially to investigate the current status of the TENVC of selected IHLs in the case study.

Data Analysis

For the convenience samples, the database for respondents was compiled from registered technical students who were enrolled for the Information Systems, Computer Science, Software Engineering, Multimedia and Network, Electrical & Electronic, and Communications courses over a period of one semester in the final semester of the study. The data for the sample size were gained from multi resources, i.e. lectures who taught the related courses; and IHLs or official school websites. Throughout this process, a list of 2534 registered technical students from 12 Malaysian IHLs, and 684 technical students from 6 universities in developed countries, i.e. UK and USA were identified. Of these, 1886 persons had no contact details from all the databases and could not be contacted by e-mail or through home mailing addresses. Table 1 shows the total convenience sample size of the UGTS and the profiles of the respondents is shown in Table 2.

Table 1

Convenience Sample Size

No	Name of IHLs	Total sample size		Sample with no contact details
		No. of samples	Total sample size	
1	Universiti Utara Malaysia (UUM)	257		122
2	Universiti Malaya (UM)	262		188
3	Universiti Kebangsaan Malaysia (UKM)	238		174
4	Universiti Teknologi Malaysia (UTM)	286		153
5	Universiti Sains Malaysia (USM)	183	2534	72
6	Universiti Tun Hussein Onn Malaysia (UTHM)	170		119
7	Universiti Teknikal Malaysia Melaka (UTeM)	211		165

(continued)

No	Name of IHLs	Total sample size		Sample with no contact details
		No. of samples	Total sample size	
8	Universiti Malaysia Perlis (UniMAP)	296		114
9	Universiti Kuala Lumpur (UniKL)	164		84
10	Universiti Malaysia Kelantan (UMK)	179	2534	87
11	Universiti Sains dan Teknologi Malaysia (MUST)	177		97
12	Universiti Multimedia (MMU)	211		126
13	University of Cambridge (UC)	137		57
14	University of Edinburgh (UE)	86	684	41
15	Sheffield Hallam University (SHU)	91		44
16	Massachusetts Institute of Technology (MIT-Sloan)	121		76
17	University of California Berkeley (UCB)	134		84
18	University of Florida (UF)	115		83
TOTAL			3218	1886

Table 2

Profile of Respondents

	No. of responses	Percent
Characteristics		
<i>Total number of respondents</i>	2016	100.0
Education Field		
Information Systems	311	15.43
Computer Science	224	11.11
Software Engineering	327	16.22
Multimedia	348	17.26
Network	211	10.47
Electrical & Electronic	268	13.29
Communication	223	11.06
Other	74	3.76
<i>Total Number of Respondents</i>	1986	98.51
<i>Missing System/ No response</i>	30	1.49

(continued)

	No. of responses	Percent
Characteristics		
Current Status of UGTS on TENVC		
S0: No business idea and no intention to get involved in HTV	782	38.79
S1: No business idea with future intention to get involved in HTV	496	24.60
S2: Having business idea & intent to get involved in the future	590	29.27
S3: Start-up (Seed - 24 Months)	213	10.57
S4: Running business more than 24 Months	51	2.53
<i>Total Number of Respondents</i>	1985	98.46
<i>Missing System/ No response</i>	31	1.54

The results of hypothesis testing suggested that the Pearson correlation coefficient for entrepreneurial spirit positively and significantly correlated to the TENVC level of UGTS ($r=.394$, $p=.00$). This means that the null hypothesis of no significant relationship is rejected. On the influence of self-efficacy to the TENVC level of UGTS, the Pearson correlation coefficient shows ($r=.399$, $p=.003$). The result suggests that there is a significant and positive relationship between self-efficacy and the TENVC level of UGTS. So, the null hypothesis is also rejected. The outcome is shown in Table 3. Further detailed correlation analysis of the entrepreneurial spirit cluster and self-efficacy cluster toward the TENVC level of UGTS are shown in Table 4 and Table 5.

Table 3

Pearson Correlation between Personal Qualities and TENVC at IHLs

Independent variable		Dependent variable Respondents qualities – HTV Level
Entrepreneurial spirit	Pearson correlation	.394(**)
	sig. (2-tailed)	.000
	N	1996
Self- efficacy	Pearson correlation	.399(**)
	sig. (2-tailed)	.000
	N	1995

** Correlation is significant at the 0.01 level (2-tailed).

Table 4

Entrepreneurial Spirit Cluster and its Correlation with TENVC level of UGTS

Independent variable Entrepreneurial spirit of respondents		Dependent variable HTV level of UGTS
Ready for challenges	Pearson correlation sig. (2-tailed) N	.326(**) .000 2015
Tolerance of risk	Pearson correlation sig. (2-tailed) N	.274 (*) .007 2012
Desire for control	Pearson correlation sig. (2-tailed) N	.288(*) .002 2005
Desire to succeed	Pearson correlation sig. (2-tailed) N	.569(**) .000 2016
Perseverance	Pearson correlation sig. (2-tailed) N	.491(**) .000 2001
Decisiveness	Pearson correlation sig. (2-tailed) N	.413(**) .000 2006

** Correlation is significant at the 0.01 level (2-tailed).

Table 5

Self-efficacy Cluster and its Correlation with HTV Level of UGTS

Independent variable Self-efficacy of respondents		Dependent variable HTV level of UGTS
Opportunity obsession	Pearson correlation sig. (2-tailed) N	.368(**) .000 2015
Motivation to excel	Pearson correlation sig. (2-tailed) N	.373 (**) .003 1995

(continued)

Independent variable Self-efficacy of respondents		Dependent variable HTV level of UGTS
Commitment	Pearson correlation sig. (2-tailed) N	.448(**) .002 2001
Creativity	Pearson correlation sig. (2-tailed) N	.378(**) .000 2016
Self-reliant	Pearson correlation sig. (2-tailed) N	.418(**) .000 2001
Ability to adapt	Pearson correlation sig. (2-tailed) N	.388(**) .001 1999
Determination	Pearson correlation sig. (2-tailed) N	.421(**) .000 2005

On the other hand, judgment sampling was used as a method to go through the in-depth interviews for the qualitative study. This method was chosen since only specific respondents or key informers (KI) that could provide the information were needed. Four (4) Malaysian IHLs, and Six (6) IHLs in developed countries that had been selected as sample frames for this research included UC, UE, and SHU from UK; and MIT-Sloan, UCB, and UF from USA. On top of that, judgment sampling was also used to access the data and information from four (4) venture capitalists. The judgment sampling and key informant feedback are shown in Table 6.

Table 6

Key Informants, In-depth Interviews on Entrepreneurial Spirit and Self-efficacy as Key Factors for TENVC.

Judgement sampling	Entrepreneurial spirit versus self-efficacy			
	Key informant 1		Key informant 2	
	Points of view	Key factor	Points of view	Key factor
UM	Entrepreneurial spirit is the most important factor, but needs to be followed by self-efficacy for action.	Entre. spirit	Correspondingly important for both factors. impossible to start the HTV without spirit and self-efficacy.	Both are equally important.

(continued)

Judgement sampling	Entrepreneurial spirit versus self-efficacy			
	Key informant 1		Key informant 2	
	Points of view	Key factor	Points of view	Key factor
UUM	Both factors are important for TENV C and the factors complement each other.	Both are equally important.	Entrepreneurial spirit is important but self-efficacy is the key factor. Spirit alone is not enough without action.	Self-efficacy
UniKL	Both factors are equally important. Self-efficacy is the capability to implement with the support of strong entrepreneurial spirit.	Both are equally important.	Entrepreneurial spirit is a key start of TENV C, yet self-efficacy is needed to prove the capability to start and be involved in the HTV.	Both are equally important.
UTM	Equally important for both factors to be involved in the TENV C.	Both are equally important.	Both factors are equally important to make sure of the success of their venture.	Both are equally important.
University of Cambridge	Self-efficacy is more important, spirit alone is not enough, many start-up failed within 2 years without capability.	Self-efficacy	Both factors are equally important to the TENV C. Need for both factors to start, sustain & grow.	Both are equally important.
University of Edinburgh	Entrepreneurial spirit is a key to start, yet self-efficacy is a proof of capability for the TENV C. Hence, entrepreneurial spirit will make sure an entrepreneur sustains and remains to move forward.	Both are equally important.	Generally, an entrepreneur with high self-efficacy will always have a strong entrepreneurial spirit. An entrepreneurial spirit is very important for an entrepreneur, but an entrepreneur needs to be supported by self-efficacy to move forward.	Both are equally important.
SHU	Both factors are very important for the TENV C. Entrepreneurial spirit is a pushing factor, and self-efficacy is the action.	Both are equally important.	Entrepreneurial spirit is important, but spirit alone is not enough. An entrepreneur needs to have the capability to make thing happen.	Both are equally important.

(continued)

Judgement sampling	Entrepreneurial spirit versus self-efficacy			
	Key informant 1		Key informant 2	
	Points of view	Key factor	Points of view	Key factor
Massachusetts Institute of Technology	Spirit is an encouraging key factor, while strong self-efficacy is the capability to implement. Entrepreneurial spirit not only happens at the starting stage but along the process of entrepreneurship.	Both are equally important.	An entrepreneur needs both entrepreneurial spirit and self-efficacy to ensure a high success rate in their venture. Both factors are correspondingly important.	Both are equally important.
University of Harvard	People with strong entrepreneurial spirit will always have strong momentum & people with strong self-efficacy will always have the capability to make things happen. Thus both factors are very important to the TENV.	Both are equally important.	Self-efficacy is always discussed in behavioral p, yet entrepreneurial spirit relates to the traits approach. Both factors are equally important to make sure of the success of their venture.	Both are equally important.
UF	To make of sure the success of the venture, an entrepreneur needs to have both spirit and self-efficacy.	Both are equally important.	Both factors are correspondingly important to the TENV. Every entrepreneur needs to have both factors to start, sustain & grow.	Both are equally important.
VC1	Both these factors complement each other in the TENV process.	Both are equally important.	Both factors are correspondingly important for business ventures.	Both are equally important.
VC2	Both factors are very important in business venture. These factors complement the success of the entrepreneur.	Both are equally important.	Entrepreneurial spirit is important, yet the capability to implement is more important.	Self-efficacy
VC3	An entrepreneur needs to have both factors for the success of the business.	Both are equally important.	Entrepreneurial spirit is the most important factor, self-efficacy is needed make sure the business is capable of generating profit.	Entre. spirit

(continued)

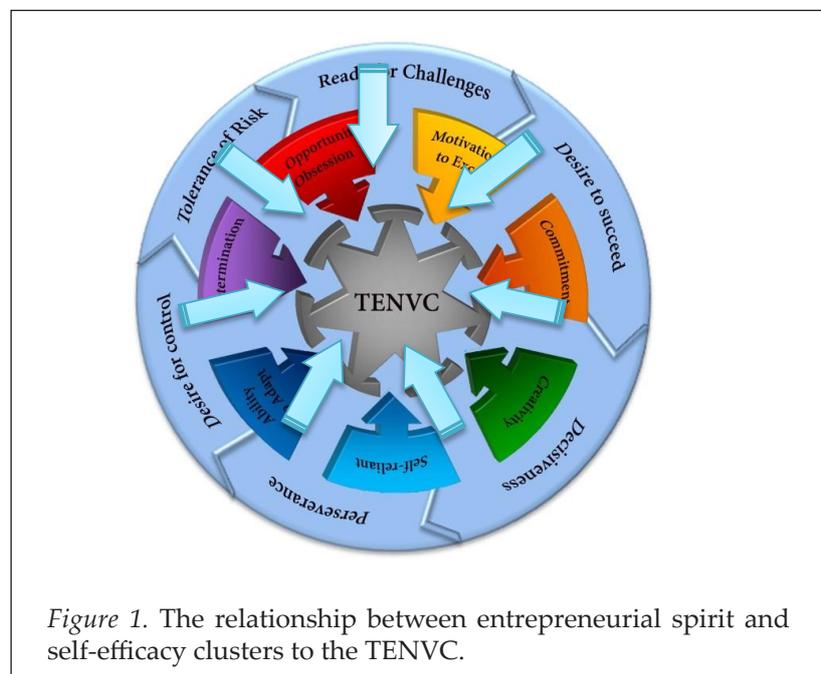
Judgement sampling	Entrepreneurial spirit versus self-efficacy			
	Key informant 1		Key informant 2	
	Points of view	Key factor	Points of view	Key factor
VC4	An entrepreneur needs to have a strong entrepreneurial spirit to keep the momentum going. Yet the capability to make things happen is the most important point for the business venture.	Self-efficacy	Both factors are correspondingly important for business ventures, not only at the starting stage but also along the business journey.	Both are equally important.

Finding and Discussion

The hypothesis evaluation between the self-efficacy of the participant and the TENVC level among UGTS in IHLs suggests that there is a positive relationship between the factors, in which case, as the participant's self-efficacy increases, which constitutes his capability to make things happen, their TENVC level also increases. This analysis also demonstrates the importance of a respondent's self-efficacy clusters and the TENVC level of UGTS in IHLs. Implications of this point to the idea that an increase in opportunity obsession, motivation to excel, commitment, creativity, self-reliant, ability to adapt, as well as determination are likely to lead to an increase in the level of the TENVC. As Bandura (1997) noted, perceived self-efficacy of the individual leads to the development of inner control that shapes his behavior toward a specific activity or goal.

Consequently, with only different small values ($r=.005$, $p=.00$) and ($r=.024$, $p=.00$) lower compared to self-efficacy, hypothesis assessment between entrepreneurial spirit of the participant and the TENVC level of UGTS in IHLs shows a high significant positive relationship between the variables. This finding shows that, as the participant's entrepreneurial spirit increases, their TENVC level also increases. The analysis of the respondents' entrepreneurial spirit clusters and the TENVC level of UGTS in IHLs also show a positive significant relationship between the clusters and the TENVC level of UGTS in IHLs. Even though with different degrees of positive significant relationships, the finding leads to the idea that an increase in ready for challenges, tolerance of risk, desire for control, desire to succeed, perseverance, as well as decisiveness are likely to lead to an increase the level of the TENVC.

This result is supported by the finding from in-depth interviews through the qualitative study. The finding shows that two (2) respondents highlighted that entrepreneurial spirit is the most important part for the TENVC instead of self-efficacy since this factor seems to be the pushing indicator for the TENVC to start. Yet, both respondents agreed that the spirit needs to be accompanied by self-efficacy for action to make sure the business was capable of generating profit. On the other hand, four (4), respondents believed that self-efficacy is more important as the key factors for the TENVC, since self-efficacy is about the capability to make thing happen. This thought is supported by the fact that many young entrepreneurs without the capability to ensure the success of the business venture failed within two years. Still, entrepreneurial spirits are essential along the journey of the TENVC to keep the momentum going. Nevertheless, 18 of key informants among the TEDO management and five (5) venture capitalists highlighted that both entrepreneurial spirit and self-efficacy are correspondingly important as key factors for the TENVC since both factors complement each other during the entire process of the TENVC. The relationship between entrepreneurial spirit and self-efficacy clusters to the TENVC is illustrated in the model as shown in Figure 1.



As specified by Hatch and Zweig (2006), entrepreneurial spirit is the embodiment of a collection of personal traits that are most possessed by business founders. Indeed, some traits were more predominant in some individuals than in others. It is a gift that inspires people with passion, positivity, leadership and ambition to become the best they can be (Pierce, 2008), as well as propels individuals to incur great personal risk, abandon their jobs and start their own businesses as well as encourages self-pride and recognition for each individual's contribution to a corporate end product (Gatty, 2013).

Conclusion

Even though, there is inconsistency in previous researchers defining entrepreneurship and entrepreneur, as well as the issues concerning the traits and behavioral approaches still being debated, the result from the 2016 respondents through the quantitative study and the 24 respondents from the qualitative study gives a clear understanding to the researchers regarding the issues. The study that was done among UTGS and key informants in 12 Malaysian IHLs and six (6) IHLs in UK and USA, as well as four (4) venture capitalists guide the researchers to think that both entrepreneurial spirit and self-efficacy are correspondingly important to the TENVC. The combination of self-efficacy clusters functions as the key to turn on the TENVC on the platform of entrepreneurial spirit clusters. Entrepreneurs need both entrepreneurial spirit and self-efficacy to ensure high success in their ventures. Entrepreneurial spirit is an encouraging factor along the process of the TENVC, while self-efficacy is the key capability to implement and make things happen along the journey of the TENVC.

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