Entrepreneurial Spirit and Self-efficacy as Key Factors for 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 between the paradigm shifts from trait approach to the behavioral approach which emerge from what successful entrepreneurs do and how they perform, rather than what their personality traits. Therefore, the purpose of this research is to study both entrepreneurial spirit and self-efficacy as key factors for TENVC. Mixed methods research was employed combining quantitative and qualitative approach. The samples were chosen based on convenience sampling for quantitative study and judgment sampling for qualitative study. The finding shows that both entrepreneurial spirit and self-efficacy are correspondingly important for TENVC among technical students and IHLs. There is only small different value of their positive significant relationship lead by self-efficacy compared to entrepreneurial spirit with r=.005 and r=.004 for both TENVC of technical students and current status of TENVC in IHLs. This finding is convergent with the outcome from the case study analysis that both factors are among the key indicators for TENVC of technical student and the current status of TENVC in IHLs. The technology entrepreneur development organizations (TEDO) may utilize this result in developing TENVC in their institution.

Key words: Entrepreneurship, Technology entrepreneurship, Technology entrepreneur new venture creation, Technical student, Young technical graduate.

1.0 BACKGROUND OF THE RESEARCH CONTEXT

Previous researchers have been inconsistent in their definitions of entrepreneurship and entrepreneur (Brockhaus and Horwitz, 1986; Gartner, 1989). Over time, definition of entrepreneurship stressing the characteristic traits or qualities supposedly possessed by entrepreneur (Kaufmann and Dant, 1998), some writers have identified entrepreneurship with the function of uncertainty-bearing, others with the coordination of productive resources, also others with the introduction of innovation, and still others with the provision of capital (Hoselitz, 1952). Even though the earlier focus of entrepreneurship research was on the personality traits, but in the modern notion, there has been no typical entrepreneur, who has become the driving force to focus on the activities of the entrepreneur or on the entrepreneurial process (Lotz, 2006).

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 set of personality-based approach focuses on the personality of the entrepreneur. Entrepreneurial spirit has been previously discussed by many researchers as part of 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 that most. Indeed, some traits were more predominant in some than in others. It is propelled or motivated individuals to incur great personal risk, to abandon their jobs and

to start their own businesses as well as encourages self-pride and recognition for each individual's contribution to a corporate end product (Gatty, 2013).

Accordingly, behavioral approach has been taken by Gartner (1989), Timmons and Spinelli (2009), and Kuratko and Hodgetts (2006) in the study of entrepreneurial process and the activities of the entrepreneur. Southon and West (2005), defined entrepreneurs are very special people, who are born optimists, confident, charismatic, and ambitious, obsessed with work, in a hurry and have bags of energy. This definition relates the principal 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 capabilities to produce designated levels of performance that exercise influence over events that affect their lives. A person with high self-efficacy are more willing to expend effort and 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 strength of entrepreneurial intentions as well as the likelihood that those intentions will translate into entrepreneurial actions.

Hence, similar to born or made debates issue of entrepreneur, the driving force issues concerning trait or behavioral approach as the key factors for TENVC also has become one of the critical and on-going debates among the researchers in entrepreneurship area. Therefore, the purpose of this research is to study both entrepreneurial spirit and self-efficacy as key factors for TENVC. This purpose is supporting by two main objectives i.e.

i. To study the important of both trait factor i.e. entrepreneurial spirit and behavioral factor i.e. self-efficacy to the TENVC of young technical graduate (YTG); and
ii. To study the influence of this factors to the current status of TENVC in IHLs

There are Four (4) research hypotheses in this study i.e.

H1: entrepreneurial spirit is more likely to influence the TENVC among technical student.
H2: Self-efficacy is more likely to influence the TENVC among technical student.
H3: entrepreneurial spirit is more likely to influence the curent status of TENVC in IHLs.
H4: Self-efficacy is more likely to influence the curent status of TENVC in IHLs.

The research analyzed base on respondents' perception. The study has been conducted among undergraduate technical student (UGTS), young technical graduate (YTG), and key informants of TEDO from IHLs and venture capitalists.

2.0 RESEARCH METHODOLOGY

According to Yin (1994) quantitative approach is strong and justified in measuring variables however fails to ascertain deeper underlying meaning and explanation of built environment. On the other hand, qualitative research is concern with understanding, interpreting, describing particular phenomena (Morse and Field, 1995), which little is yet known (Strauss and Corbin, 1990). There is strong suggestion from the research community that both quantitative and qualitative, are best thought of as complementary and should therefore be mixed since some researchers believe that qualitative and quantitative research can be effectively combined in the same research project (Strauss and Corbin, 1990; Patton, 1990; Russex and Weinberg, 1993).

As the above mentioned, it is clear that qualitative methods are best at gaining access to the subjective aspects of individuals and groups, whereas quantitative methods are best for collecting clear, rigorous, and reliable collections of data for testing empirical hypotheses. Therefore, mixed methods strategies were used to meet the objectives of the study. Several data collection methods used for the research includes; (1) questionnaires survey; (2) semi structure interview; and (3) documentations review. By

using the mixed method research strategy, the researchers move from blending the theoretical and empirical study to quantitative and to qualitative study. The rational of adopting the mixed strategy is 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 and might result in a more robust and generalizable set of findings (Jack and Raturi, 2006). In term of data collection tools, the researchers practice the common instrument used by previous researchers which are: questionnaire survey, interview and documentation review for data collection method. The samples were chosen based on convenience sampling for quantitative study i.e. UGTS, PTES, and YTG; and judgment sampling for qualitative study i.e. TEDO key informants and venture capitalist.

This research is conducted in three stages. The first stage involves informal interview and literature review to develop the problem statement, research objective, and 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 "SurveyShare" software for the EQS. In the third stage, semi structured interview was adopted to provide deepness to the research study. Completing in-depth interview analysis, the researcher also took on the documentation review method especially to investigate the current status of TENVC of selected IHLs in the case study.

3.0 DATA ANALYSIS

For the convenience samples, 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 to final semester of the study. The data of the samples size were gain from multi resources i.e. lectures who teach the related course; and IHLs or school official websites. Throughout this process, a list of 2534 registered technical student from 12 Malaysian IHLs, and a list of 684 technical students from 6 universities in developed countries i.e. UK and USA were identified. Of these, 1837 persons had no contact detail from all database and could not be contacted e-mail or home mailing address. Table 1 shows the total convenience sample size of the UGTS. Profile of respondents is shown in Table 2, while the current status of TENVC among respondents and their current study level is shown in Table 3.

Table 1: Convenience Sample size

No	Name of IHLs	Total Sample Size		Sample With No Contact Details
		No of Sample	Total sample size	
1.	Universiti Utara Malaysia (UUM)	257	2534	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		72
6.	Universiti Tun Hussein Onn Malaysia (UTHM)	170		119
7.	Universiti Teknikal Malaysia Melaka (UTeM)	211		165
8.	Universiti Malaysia Perlis (UniMAP)	296		114
9.	Universiti Kuala Lumpur (UniKL)	164		84
10.	Universiti Malaysia Kelantan (UMK)	179		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		41

15.	Sheffield Hallam University (SHU)	91	684	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		**3318**	**1887**

Table 2: Profile of respondents

Characteristics	No. of Response	Percent
Gender		
Male	1086	53.87
Female	930	46.13
Total Number of Respondents	*2016*	*100.0*
Age Group		
22-25	1712	84.92
26-30	247	12.25
31-35	39	1.94
36-40	18	0.89
Total Number of Respondents	2016	100.0
Education Fields		
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
Total Number of Respondents	*1986*	*98.51*
Missing System/ No respond	*30*	*1.49*
Current Status of UGTS on TENVC		
S0: No business idea and no intention to get involve in HTV	782	38.79
S1: No business idea with future intention to get involve 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 24 Months	51	2.53
Total Number of Respondents	*1985*	*98.46*
Missing System/ No respond	*31*	*1.54*

Table 3: Status of TENVC among respondents and their current study

TENVC Current Status/Semester	Sem. 1 &2	Sem. 3 & 4	Sem. 5 & 6	Sem. 7& above	No. of Response
S0	533	157	79	13	**782**
S1	241	122	94	19	**496**
S2	27	259	276	28	**590**
S3	4	23	145	41	**213**
S4		3	16	32	**51**

Result on hypothesis testing suggested that Pearson correlation coefficient for entrepreneurial spirit positively and significantly correlated to TENVC level of UGTS (r=.394, p=.00) and (r=.572, p=.00) for the current status of TENVC in IHLs. 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 at (r=.345, p=.003), while (r=.548, p=.000) for current status of TENVC in IHLs. The result suggests that there is a significant and positive relationship between self-efficacy and TENVC level of UGTS and current status of TENVC in IHLs. So, the null hypothesis is also rejected.

Table 5: Pearson correlation between personal qualities and TENVC at IHLs

Independent Variable		Dependent Variable: Respondents Qualities – HTV Level	Dependent Variable: Current Status of TEDO –HTV Level
Entrepreneurial Spirit	Pearson Correlation	.394(**)	.572(**)
	Sig. (2-tailed)	.000	.000
	N	1996	2009
Self- Efficacy	Pearson Correlation	.399(**)	.576(**)
	Sig. (2-tailed)	.000	.000
	N	1995	1998

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

The following Table 6 and Table 7 are the entrepreneurial spirit and the self-efficacy clusters that are significantly and positively correlated with HTV level of UGTS in IHLs.

Table 6: Entrepreneurial spirit cluster and it correlation with TENVC Level of UGTS

Independent Variable Self-Efficacy of Respondents		Dependent Variable HTV level of UGTS	Independent Variable TEDO Current Status		Dependent Variable HTV level of UGTS
Ready for challenges	Pearson Correlation	.326(**)	Ready for challenges	Pearson Correlation	.415(**)
	Sig. (2-tailed)	.000		Sig. (2-tailed)	.000
	N	2015		N	2011
Tolerance of risk	Pearson Correlation	.274 (*)	Tolerance of risk	Pearson Correlation	.573(**)
	Sig. (2-tailed)	.007		Sig. (2-tailed)	.000
	N	2012		N	2014
Desire for control	Pearson Correlation	.288(*)	Desire for control	Pearson Correlation	.698(**)
	Sig. (2-tailed)	.002		Sig. (2-tailed)	.000
	N	2005		N	2002
Desire to succeed	Pearson Correlation	.569(**)	Desire to succeed	Pearson Correlation	.660(**)
	Sig. (2-tailed)	.000		Sig. (2-tailed)	.000
	N	2016		N	2015
Perseverance	Pearson Correlation	.491(**)	Perseverance	Pearson Correlation	.496(**)
	Sig. (2-tailed)	.000		Sig. (2-tailed)	.000
	N	2001		N	2000
Decisiveness	Pearson Correlation	.413(**)	Decisiveness	Pearson Correlation	.592(**)
	Sig. (2-tailed)	.000		Sig. (2-tailed)	.000
	N	2006		N	2007

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

Table 7: Self-efficacy cluster and it correlation with HTV Level of UGTS

Independent Variable Self-Efficacy of Respondents		Dependent Variable HTV level of UGTS	Independent Variable TEDO Current Status		Dependent Variable HTV level of UGTS
Opportunity Obsession	Pearson Correlation	.368(**)	Opportunity Obsession	Pearson Correlation	.579(**)
	Sig. (2-tailed)	.000		Sig. (2-tailed)	.000
	N	2015		N	1998
Motivation to Excel	Pearson Correlation	.373 (**)	Motivation to Excel	Pearson Correlation	.588(**)
	Sig. (2-tailed)	.003		Sig. (2-tailed)	.000
	N	1995		N	1999
Commitment	Pearson Correlation	.448(**)	Desire for control	Pearson Correlation	.547(**)
	Sig. (2-tailed)	.002		Sig. (2-tailed)	.000
	N	2001		N	2002
Creativity	Pearson Correlation	.378(**)	Creativity	Pearson Correlation	.589(**)
	Sig. (2-tailed)	.000		Sig. (2-tailed)	.000
	N	2016		N	2015
Self-reliant	Pearson Correlation	.418(**)	Self-reliant	Pearson Correlation	.563(**)
	Sig. (2-tailed)	.000		Sig. (2-tailed)	.000
	N	2001		N	2004
Ability to Adapt	Pearson Correlation	.388(**)	Ability to Adapt	Pearson Correlation	.616(**)
	Sig. (2-tailed)	.001		Sig. (2-tailed)	.000
	N	1999		N	2001

Determination	Pearson Correlation Sig. (2-tailed) N	421(**) .000 2005	Determination	Pearson Correlation Sig. (2-tailed) N	.552(**) .000 2008

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

On the other hand, judgment sampling was used as a method to go through in-depth interview for qualitative study. This method was chosen since only specific respondents or key informers (KI) that could provide the information needed. Four (4) Malaysian IHLs, and Six (6) IHLs in developed countries that have been selected as sample frame for this research includes UC, UE, and SHU from UK; and MIT-Sloan, UCB, and UF from USA. On top of that, judgment sampling also has been used to access to the data and information from Four (4) venture capitalists. The judgment sampling and key informant feedback is shown in Table 8.

Table 9: key informants in-depth interview on entrepreneurial spirit and self-efficacy as key factors for TENVC.

Judgement Sampling	**Entrepreneurial Spirit Versus Self-Efficacy**			
	Key informant 1		**Key informant 2**	
	Point of Views	**Key Factor**	**Point of Views**	**Key Factor**
UM	Entrepreuerial spirit is the most important factor, but need 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
UUM	Both factors are important for TENVC and the factors are completing 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	Entrepreneiral spirit is a key start of TENVC, yet self-efficacy needed to prove the capability start and involve in the HTV.	Both are equally important
UTM	Equally important for both factors to involve in TENVC.	Both are equally important	Both factor are equally important to makesure 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 fectors are equally important to the TENVC. Need for both factors to start, sustain & growth.	Both are equally important
University of Edinburgh	Entrepreneurial spirit is a key to start, yet self-efficacy is a prove of capability for TENVC. Hence, entrepreneurial spirit will make sure an entrepreneur to sustain and remain to move forward.	Both are equally important	Generally, entrepreneur with high self-efficacy will always have strong entrepreneurial spirit. Entrepreneurial spirit is very important for entrepreneur, but an entrepreneur need to be supported by self –efficacy to mo ve forward.	Both are equally important
SHU	Both Factors are very important for TENVC. Entrepreneurial spirit is a pushing factors, and self-efficacy is the action.	Both are equally important	Entrepreneurial spirit is important, but spirit alone is not enough. Entrepreneur need to have the capability to make thing happen.	Both are equally important

Massachusetts Institute of Technology	Spirit is an encouraging key factor, while strong self-efficacy is a capability to implement. Entrepreneurial spirit not only happen at starting stage but along the process of entrepreneurship.	Both are equally important	An entrepreneur need for both entrepreneurial spirit and sefl-efficacy to ensure the 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 capability to make things happen. Thus both factors are very important to TENVC.	Both are equally important	Self-efficacy is always been discussed in behavioral p,yet entrepreneurial spirit relate to traits approach. Both factor are equally important to makesure the success of their venture.	Both are equally important
UF	To make sure the susscess of the venture, an entrepreneur need to have both spirit and self-efficacy	Both are equally important	Both fectors are correspondingly important to the TENVC. Every entrepreneur need to have both factors to start, sustain & growth	Both are equally important
VC1	These both factors are complement to each other along the TENVC process.	Both are equally important	Both factors are correspondingly important for business venture.	Both are equally important
VC2	Both factors are very important in business venture. These factors are complement for the success of entrepreneur.	Both are equally important	Entrepreneurial spirit is important, yet the capability to implement is more important.	Self-efficacy
VC3	Entrepreneur need to have both factors for the success of the business	Both are equally important	Entrepreuerial spirit is the most important factor, self-efficacy is need make sure the business is capable to generate the profit.	Entre. spirit
VC4	Entrepreneur need to have strong entrepreneurial spirit to keep the momentum going, Yet the capability to make thing happen is the most important point for the business venture.	Self-efficacy	Both factors are correspondingly important for business venture. not only at starting stage but along the business journey	Both are equally important

4.0 FINDING AND DISCUSSION

Hypothesis evaluation between self-efficacy of the participant versus TENVC level of UGTS and the current status of TENVC in IHLs show high significant positive relationship between the factors. In which case, as the participant's self-efficacy increases, which constitute his capability to make things happen, their TENVC level and the current status of TENVC in IHLs also increase. Analysis on respondent's self-efficacy clusters versus both TENVC level of UGTS and the current status of TENVC in IHLs also show positive significant relationship for between the clusters to both TENVC level of UGTS and the current status of TENVC 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 level and status of TENVC. As stated by Bandura (1997) and Timmons and Spinelli (2007), a higher perceived self-efficacy of the person tends to transform that person to a more optimistic, courageous, committed and determined type of person. A perceived higher self-efficacy constitute to the development of inner control or being self-reliant and the ability to adapt by the entrepreneur (Timmons and Spinelli, 2007; Hisrich, Peters and Shepherd, 2005; Bandura, 1997). As such the person tends to rely on his own capability and is likely to be ready in any culture change that might occur. Perceived self-efficacy of the individual shapes his attitude and behavior toward a specific activity or goal (Timmons and Spinelli, 2007; Bandura, 1997).

Consequently, with only different small value at (r=.005, p=.00) and (r=.024, p=.00) lower compared to self-efficacy, hypothesis assessment between entrepreneurial spirits of the participant versus

TENVC level of UGTS and the current status of TENVC in IHLs show high significant positive relationship between the variables. This finding shows that, as the participant's entrepreneurial spirit increases, their TENVC level and the current status of TENVC in IHLs also increase. Analysis on respondent's entrepreneurial spirit clusters versus both TENVC level of UGTS and the current status of TENVC in IHLs also show positive significant relationship for between the clusters to both TENVC level of UGTS and the current status of TENVC in IHLs. Even though with different degree of positive significant relationship, the finding guide 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 level and status of TENVC. As specified by to Hatch and Zweig (2006), entrepreneurial spirit is the embodiment of a collection of personal traits that most. Indeed, some traits were more predominant in some 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 propelled individuals to incur great personal risk, to abandon their jobs and to start their own businesses as well as encourages self-pride and recognition for each individual's contribution to a corporate end product (Gatty, 2013).

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

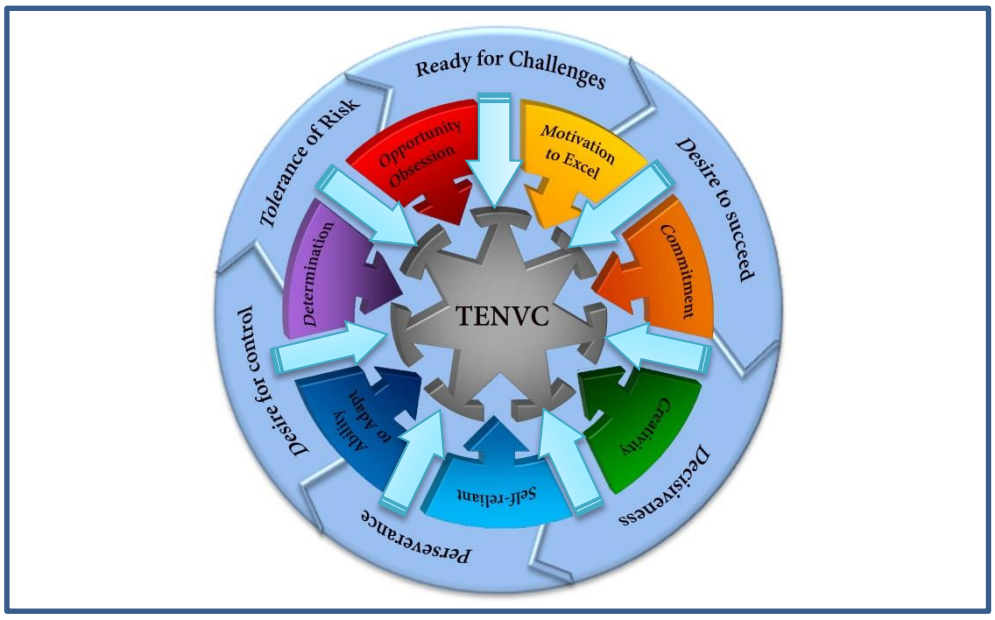

Figure 1: The relationship between entrepreneurial spirit and self-efficacy clusters to TENVC

CONCLUSION

Even though, there is inconsistent of previous researchers in defining entrepreneurship and entrepreneur, as well as the issues concerning traits and behavioral approaches still in debates, the result from 2016 respondents through quantitative study and 24 respondents from qualitative study give a clear understanding to the researchers regarding the issues. The study that have been done among UTGS and key informants over 12 Malaysian IHLs and Six (6) IHLs in UK and USA, as well as Four (4) venture capitalists guide the researchers to have a thought that both entrepreneurial spirit and self-efficacy are correspondingly important to the TENVC. The combination of self-efficacy clusters has function as the key to turn on the TENVC on the platform of entrepreneurial spirit clusters. Entrepreneurs need for both entrepreneurial spirit and sefl-efficacy to ensure the high success in their venture. Entrepreneurial spirit is an encouraging factor along the process of TENVC, while self-efficacy is the key capability to implement and to make thing happen along the journey of TENVC.

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