

## Future Technical Professionals Interrelationship on Personality, Self-Efficacy and Entrepreneurial Intention

**Tan Ooi Kuan\***

Centre for Disaster Risk Reduction, Department of Civil Engineering, Lee Kong Chian Faculty of Engineering & Science  
Centre for Business and Management, Malaysia

**Cham Tat Huei**

Faculty of Accountancy and Management Jalan Sungai Long, Bandar Sungai Long, Cheras, 43000 Kajang, Selangor D. E., Malaysia

**Chuah Siong Yee**

Centre for Disaster Risk Reduction, Department of Civil Engineering, Lee Kong Chian Faculty of Engineering & Science, Malaysia

### Abstract

Entrepreneurship skill is considered as an essential skill in the current era of Industry 4.0. The past literature has reported that entrepreneur intention of an individual plays a significant role in his or her decision to establish a new firm and getting involved with business activities. Hence, this study aims to investigate the influence of the personality and self-efficacy on entrepreneurial intention among the future technical professionals in the non-for-profit higher education institution of Malaysia. Moreover, the moderating effect of gender on the relationship between personality and self-efficacy on entrepreneurial intention was also examined in the present study. A total of 475 responses were collected with the use of survey questionnaire from the future technical professionals from non-for-profit higher education institutions in Malaysia. The results of this study show that personality and attitude of future technical professionals were found to have a significant impact on the entrepreneurial intention. Furthermore, gender also found to have a moderating effect on the relationship between personality and self-efficacy on entrepreneurial intention. The practical implications of the research findings were discussed.

**Keywords:** Personality; Self-efficacy; Entrepreneurial intention; Technical professionals.



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### 1. Introduction

The engaging of entrepreneurship is one of the main factors that lead to the economic development for a nation (Petrov, 2013). Entrepreneurship is not a new term but it has created many opportunities that improve the economy of one country via promoting economy efficiencies and creating more job opportunities Pretheeba (2014). Public perception on Private higher education institutions that unable to provide sufficient learning equipment leading to the lower quality compare to public higher institutions has been arisen for many years. The misperception also transpires to the private non-for-profit higher learning institutions to have lower par than private-for-profit higher learning institutions but, it is not true. According to The Star Online (2017) the private non-for-profit higher institution has ranked in top ten among all Malaysia universities. In fact, it is interesting to explore the learning strategy implemented in private non-for-profit higher institution especially on future technical professional's learning and adaptation abilities.

Although, the study related to the entrepreneurial intention has been quite a common topic in the educational research, study that reflects the Malaysia scenario is still remained scant to date. To the best knowledge of the researchers, there is virtually none of the study that examined the impact on both personality and self-efficacy on entrepreneurial intention among future technical professionals in the non-for-profit higher learning institutions in Malaysia. Moreover, the moderating effect of gender on the relationship between personality and self-efficacy on entrepreneurial intention is also another worthy issue to be addressed especially in this male-dominated engineering course.

### 2. Objective of the Study

The finding from this study is important as it can serve as a guide and reference for the policy makers and also the industry players. Based on the research deficiency identified above, this study attempts to achieve the following objectives:

- 1) To examine whether personality and self-efficacy are significant predictors of entrepreneurial intention among the future technical professionals in the non-for-profit higher learning institutions in Malaysia.
- 2) To determine the moderating effect of gender on the relationship between personality and self-efficacy on entrepreneurial intention.

### 3. Literature Review

The implication of future technical professionals to be entrepreneurial has been long discussed (Tryggvason *et al.*, 2010). Compare between non-technical and technical professionals, technical professionals are usually known as problem solvers, but in fact the type of problems can be solved involves very specific scopes (Schar, 2015). Young engineering professionals has been trained to be kind of “tunnel vision” resulting from their academic learning style that only focus on smaller and limited aspects of technical scope (Couetil *et al.*, 2012). Indeed, the demand of entrepreneurial education increases substantially, the introduction of entrepreneurship module into engineering program also increases globally. However, the adaptations by the future engineering professionals have yet reached to the expectation (Abbas, 2013; Eresia-Eke and Gunda, 2015). One of the main concerns to be entrepreneurial involves high risk taking. This has built a different channel of engineering study that mainly focus on technical solving rather than looking into opportunity strategies development. As entrepreneur often giving taught of risk taking, it contradicts with engineering methodology that focus on proving solution prior to implementation process (Couetil *et al.*, 2012).

In fact, there are several elements that to lead future professionals into business world (Mohd *et al.*, 2015). According to Mould (2013) and Cherry (2016); the personality and self-efficacy play a great impact on many entrepreneurial activities (Shaver and Scott, 1993). Personality is fairly consistent throughout their whole life in person’s unique ways of thinking, feeling and acting (Cherry, 2016; Lee and Ohtake, 2014) and it will greatly impact the path and quality of life (Farooq, 2011). On the other hand, the self-efficacy described as a person’s belief on their own capabilities to organize, execute and manage a performance to accomplish a task (Petrov, 2013). As a result, it reflects onto the future technical professionals’ risk-taking willingness and optimism to be entrepreneurial. Although, suggestions have been made by many higher education institutions to add entrepreneurship subjects into engineering program as core subject, but the effectiveness to build the future technical professional entrepreneurial intention still not the cup of tea of everyone (Olakitan, 2014; Rahman *et al.*, 2012).

Perhaps, the scenario of male and female proportion in technical program also varies. Female are natural “nurturers” while men are usually aggressive and highly competitive (McLeod, 2014). Indeed, according to Campo (2011); gender study always been neglected in entrepreneurship research. The society holds a common expectations that masculine plays the important factor for business trend, including entrepreneurship, which require traits such as risk taking, independence, aggressive, and courage. Flavius (2010) and Tan *et al.* (2017) illustrated that women’s entrepreneurial intention are inconsistent and easily influenced by their emotion. As such, the conceptual framework for this study is developed. Figure 1 illustrated the conceptual framework of the study on the private non-for-profit higher education institution’s future technical professionals’ personality and self-efficacy moderating with the gender preference.

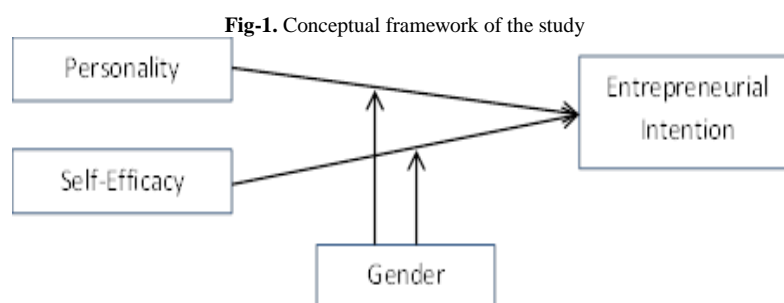
Based on the discussion above, the following hypotheses are developed to investigate the interrelationship of personality, self-efficacy and entrepreneurial intention among future technical professionals for the study:-

**H1:** The future technical professionals from private non-for-profit higher institution entrepreneurial intention are significantly influenced by their personality.

**H2:** The future technical professionals from private non-for-profit higher institution entrepreneurial intention are significantly influenced by their self-efficacy.

**H3:** Gender will moderate the relationship between personality and entrepreneurial intention.

**H4:** Gender will moderate the relationship between self-efficacy and entrepreneurial intention.



## 4. Methodology

### 4.1. Sampling Method

The target populations of this study were students who are currently pursuing engineering programme in private non-for-profit higher education institutions in Malaysia. These institutions include Universiti Tunku Abdul Rahman (UTAR), Tunku Abdul Rahman University College (TARUC), Southern University College (SUC) and New Era University College (NEUC). Out of these institutions, only UTAR and TARUC were being considered for this study due to similarity in the context of operational size, numbers of students and numbers of engineering programmes offered. SUC and NEUC were excluded from the consideration as SUC has only small numbers of engineering students (e.g. 23) and NEUC do not offer engineering program.

The survey questionnaire was distributed equally to 500 engineering students from UTAR and TARUC via email using quota sampling. According to Saunders *et al.* (2012); the sample size of 300 can represent a big population and provide generalizable result. As such, the sample size for the present study is sufficient to represent the entire population of the engineering students in non-profit private higher education institutions of Malaysia.

However, out of the 500 returned questionnaires, 25 were not usable due to missing values, yielding a final sample size of 475.

## 4.2. Measurement Items

There were three variables in this study, i.e. personality, self-efficacy, and entrepreneurial intention. These variables were operationalized to test the hypothesized relationships for the proposed conceptual model. The measurements for the existing variables of the questionnaires were adapted from the existing literature. For example, the construct of personality was adapted from Frese *et al.* (1996) and operationalized based on individual's capability in handling challenging tasks, decision making and their ability to control of/over something. As for the context of self-efficacy, this construct was adapted from Frese *et al.* (1996) and being operationalized based on individual's will and their capabilities in achieving their goals and plan. Moreover, entrepreneur intention was being operationalized based on the individual's intention and plan to start his or her business in the future. All the items were measured using 5 point Likert-scale, whereby 1 represent strongly disagree and 5 represent strongly agree.

As for the present study, self-administered survey questionnaires were employed to collect data from the respondents. The questionnaire also includes demographic questions namely gender and years of study. In order to address the matter of face validity, a pre-test and pilot testing of the questionnaire were conducted. Both of the tests found that all the questions in the survey questionnaires were relevant and unambiguous; hence, it can be assumed that the face validity for the questionnaire was established.

## 5. Results and Discussion

### 5.1. Respondents' Demographic Characteristics

After the cleaning of the data, the demographic profile of the respondents was presented in Table 1. Referring to Table 1, the data show that 79.4 percent of the students were male while the remaining were females. In the context of years of study, 15.8 percent of the students were in first year, 25.3 percent of the students were in second year, 28 percent of the students were in third year, 26.5 percent of students were in fourth year and the rest were in fifth year.

Table-1. Respondent Demographic Profiles (n= 475)

<i>Variables</i>	<i>Descriptions</i>	<i>Percentage</i>
<b>Gender</b>	Male	79.4
	Female	20.6
<b>Years of Study</b>	Year 1	15.8
	Year 2	25.3
	Year 3	28.0
	Year 4	26.5
	Year 5	4.4

### 5.2. Validity and Reliability

As for the present study, the reliability and validity of the constructs (e.g. personality, self-efficacy and entrepreneurial intention) were assessed with the use of confirmatory factor analysis (CFA) for the measurement model. According to Fox (2010); CFA is usually used by researchers to examine the relationships between observed variables and its respective continuous latent variables. In CFA, the fit of the measurement model will be assessed and to address both convergent validity and discriminant validity (Hair *et al.*, 2010). Convergent validity can be explained as the agreement between measures of the same construct while discriminant validity refers to the distinctiveness of different constructs (Guo *et al.*, 2008). The convergent validity was assessed based on the suggestion by Hair *et al.* (2010) that based on factor loadings (preferably more than 0.60), composite reliability (preferably more than 0.70) and average variance extracted, AVE (preferably more than 0.50). On the other hand, the researchers assessed the discriminant validity based on the correlation matrix with comparison of the studied constructs with its squared of AVE as suggested by Fornell and Larcker (1981). The discriminant validity will establish if the value of correlations is smaller than its squared AVE.

As for the measurement model, the model fit was examined based on the maximum likelihood estimation method (Hair *et al.*, 2010). In practice, the model fit is usually examined based on Model fit indices that include Root Mean Square Error of Approximation (RMSEA), Normed Chi-square ( $\chi^2/df$ ), Goodness of Fit (GFI), Tucker-Lewis index (TLI), Comparative Fit Index (CFI), and Parsimony Normed Fit Index (PNFI). Hair *et al.* (2010) suggested that the model with good fit would have RMSEA of less than 0.08,  $\chi^2/df$  of less than 3, GFI that exceed 0.90, TLI that exceed 0.90, CFI that exceeds 0.85 and PNFI of more than 0.50. The findings from the analysis showed that the model is fit with RMSEA = 0.056,  $\chi^2/df$  = 2.476, GFI = 0.937, TLI = 0.962, CFI = 0.969 and PNFI = 0.786.

As for convergent validity, one item has been dropped from the variable of personality due to the low loading. After the removal of the item, the convergent validity was established with all the factors loading for the measured items are above 0.60, the composite reliability for all the variables are above 0.70 and the AVE for all the constructs above 0.50. Moreover, all the value for the correlation value (off-diagonal and italic) is smaller than the squared AVE (diagonal and bold) of the same column, thus it can be ascertained that discriminant validity was established in this study.

**Table-2.** Test Results on Discriminant and Convergent Validity

<i>Constructs</i>	<i>F.L</i>	<i>C.R</i>	<i>AVE</i>	<i>1</i>	<i>2</i>	<i>3</i>
Personality	0.616 - 0.856	0.85 9	0.55 0	<b>0.74</b> <b>2</b>		
Self-efficacy	0.685 - 0.767	0.89 2	0.58 2	0.62 1	<b>0.76</b> <b>3</b>	
Entrepreneurial intention	0.617 - 0.889	0.87 2	0.63 4	0.46 4	0.40 5	<b>0.796</b>

Note: F.L= Factor loading; C.R= composite reliability; AVE= average variance extracted

### 5.3. Structural Model and Hypothesis Testing

The structural model for this study provides an adequate fit to the data in the higher education context with RMSEA = 0.057,  $\chi^2/df = 2.475$ , GFI = 0.936, TLI = 0.961, CFI = 0.965 and PNFI = 0.784. Given an adequate structural model, the hypotheses developed for the present study can be tested by examining the proposed structural model. The statistical results in Table 3 present the path coefficients ( $\beta$ ) for all hypothesized paths in the model. The results indicated that all both personality ( $\beta = 0.326$ ,  $p < 0.05$ ) and self-efficacy ( $\beta = 0.301$ ,  $p < 0.05$ ) have significant positive direct effect on entrepreneurial intention. Hence, hypothesis 1 and hypothesis 2 for the present study were supported.

**Table-3.** Hypotheses Testing of Structural Research Model

<i>Hypothesized Path</i>	<i>Standardized Beta (<math>\beta</math>)</i>	<i>Critical Ratio</i>	<i>Hypothesis</i>
H1: Personality → Entrepreneurial intention	0.326	2.610*	Yes
H2: Self-efficacy → Entrepreneurial intention	0.301	2.080*	Yes

Notes: \* denote significant at 95% confidence level

### 5.4. Moderating Effect of Gender

As for hypothesis 3 and hypothesis 4, the moderating effect of Gender for the present study was conducted based on the hierarchical multiple regression analysis as suggested by [González-Romá et al. \(2002\)](#). According to [González-Romá et al. \(2002\)](#); this method requires the moderator (e.g. gender) of respondents to be split into two groups, i.e. female and male. It was suggested that moderating effect will exist if the interaction variable have a significant contribution over and above the main-effect model. Based on the output from Table 3, it was found that gender only moderated the relationship between self-efficacy and entrepreneurial intention (model 2). The addition of the interaction terms ( $\beta = 0.234$ ,  $p < 0.05$ ) gives an explanatory contribution over and above that of the main effect-only model, which shown in step 1 ( $\Delta R^2 = 0.016$ ,  $p < 0.05$ ). This result suggested that the moderation effect of gender is present in relationship between self-efficacy and entrepreneurial intention. Hence, hypothesis 4 was supported.

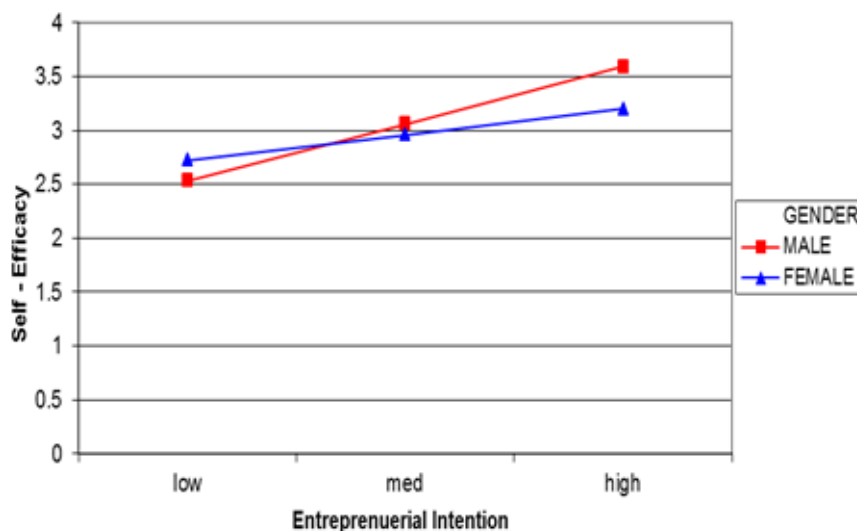
Specifically, the graph in Figure 2 indicated that although both high slopes were significantly different from zero that the male students' slope was steeper than the female counterpart. Conceptually this means that the self-efficacy is more strongly associated with entrepreneurial intention for the male students compare to the female students. In other words, male students displayed a higher level of entrepreneurial intention as compared to the female students when there was greater development of self-efficacy among them.

Table-4. Moderating Effect of Gender

DV: Entrepreneurial intention	Step 1	Step 2	Step 3
<b>Model 1 (Hypothesis 3)</b>			
Personality	0.434* *	0.433* *	0.444* *
Gender		- 0.020 <sup>n.s</sup>	- 0.021 <sup>n.s</sup>
Interaction (Personality X Gender)			- 0.022 <sup>n.s</sup>
R <sup>2</sup>	0.188	0.189	0.189
Δ R <sup>2</sup>		0.001	0.000
<b>Model 2 (Hypothesis 4)</b>			
Self-Efficacy	0.423* *	0.423* *	0.216* *
Gender		0.035* *	0.037* *
Interaction (Self-Efficacy X Gender)			0.234* *
R <sup>2</sup>	0.423	0.424	0.439
Δ R <sup>2</sup>		0.001	0.016

Notes: \*\*Significant at 99% level, \*Significant at 95% level, n.s=not significant

Fig-2. The Moderation Effect of Gender



These findings allow us to explain the research question in this study: the personality and self-efficacy of future technical professionals in private non-for-profit higher education institution to become business founders is influenced by these contextual factors and enhance the finding by moderating with gender preference..

## 6. Conclusion and Recommendation

This study provides concrete evidence that the personality, self-efficacy and gender of the students play a significant role in determining their technical professional’s entrepreneurial intention in private non-for-profit higher education institutions. Specifically, the study reveals that personality and self-efficacy is significantly correlated positively with entrepreneurial intention among future technical professionals. This finding extended that conviction to start up a new business by the future technical professionals to some extent a question of personality self-efficacy structure. However, the measure that the researchers proposed in this study will not have the same effects to others. More specifically, gender differences elucidated the effect on entrepreneurial intention in certain extent. Gender in personality has positive influenced towards entrepreneurial intention but not significant for self-efficacy. However, when female has developed for several years of working experience, their self-efficacy will change accordingly due to the exposure to the business world.

The future technical professionals may not have high intention to go beyond their current studying path way. They seem to be more promising to remain as technical professional after completing undergraduate degree than diversifying into non-technical field. This intention may be varied and improved by relevant initiatives. Hence, the transfer of entrepreneurial knowledge should be well introduced technically upon studying by giving more relevant business knowledge to the existing students. Perhaps, technopreneurship can be introduced to technical professional. Technopreneurship emphasizes on the combination knowledge between technical, business and management. This could psychologically encourage future technical professionals feel that there are still maintain in technical related industry.

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