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MODELLING OF ENTREPRENEURIAL INTENTION AMONG POLITEKNIK MALAYSIA STUDENTS USING PARTIAL LEAST SQUARES – STRUCTURAL EQUATION MODELLING

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ABSTRACT

This study explores entrepreneurial intention from psychological perspectives. By adopting the McClelland's (1961) psychological characteristic, Need for Achievement, and Ajzen's Theory of Planned Behaviour, the study investigates the factors influencing entrepreneurial intention among polytechnic students in Malaysia. A survey method was employed to collect the data, resulting in 372 usable data. The respondents were final-year diploma students studying accountancy, civil engineering, and electronic engineering from seven polytechnics in Malaysia. A Partial Least Squares-Structural Equation Modelling technique was run, with the application of the bootstrapping method, to test the relationship between research model constructs: the Need for Achievement, Attitudes, Subjective Norms, Perceived Behavioural Control, Self-Efficacy, and Entrepreneurial Intention. The measurement (outer) model and the structural (inner) model of the latent constructs were examined. The findings found that all seven hypotheses are supported. It is suggested that future studies adopt this model and replace the Need for Achievement with other psychological characteristics.

Keywords: Entrepreneurial Intention, Theory of Planned Behaviour, Polytechnics Malaysia, PLS-SEM

INTRODUCTION

Entrepreneurship has always been an interest of the Malaysian government, especially the Ministry of Higher Education. It is promoted to solve graduates' unemployment issue. The Department of Polytechnics Education Malaysia shares the same aspiration as constituted in the Polytechnic Transformational Agenda 2010 – The Second Outcome, in which polytechnics are to produce employable or entrepreneurial graduates (Department of Polytechnics Education, 2009).

Unemployment among Malaysian graduates is not new, especially with the non-static unemployment rate. Trading Economics (2016) envisages a fluctuation in the unemployment rate in Malaysia from 2016 until 2020, standing at 3.7% at the end of 2016 before continuing to increase to 3.8% in 2018 and 3.7% in 2020. Although the real rate in July 2017 is only 3.5%, the rate recorded throughout the year is still changing: it was 3.4% in May 2017, and 3.5% in January 2017 (Department of Statistic Malaysia, 2017). In February 2016, Malaysia's unemployment rate reached 3.4% for the third consecutive month, the highest percentage since November 2013 (The Star Online, 2016). In November 2013, the unemployment rate was 3.4%, with a total of 484,600 jobless people (Department of Statistic Malaysia, 2013). Malaysian polytechnic students did not escape this unfortunate environment. In 2015, 20.54% of 22,541 graduates were unemployed (Department of Polytechnics Education, 2016). The figure was similar to the statistics of 2011, when 23.9% of graduates were still unemployed after six months of convocation.

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In 1969, polytechnics were established by the government to provide training in technical and vocational areas (Wong and Hamali, 2006). After 41 years of operation, the Polytechnics Transformation Plan was introduced in 2010, establishing new three premier polytechnics, five new metro polytechnics, and 26 existing and new conventional polytechnics (Department of Polytechnics Education, 2016). This programme has enlarged the student intake, increased student enrolment, and expanded the number of polytechnic graduates, resulting in an indirect higher competition among the graduates. In October 2016, the intake of full-time programme students recorded was 35,455 students; the academic enrolment was 99,551 students; and the output for the year was 24,522 students (Department of Polytechnics Education, 2016).

Due to the competitiveness of job market, entrepreneurship is actively promoted. The outcome can be seen through the increasing numbers of graduates who choose entrepreneurship. In 2011, less than 20% of graduates became entrepreneurs; there were more than 50% entrepreneur graduates in 2015. In 2013, 1,832 graduates became entrepreneurs, compared to 2,347 graduates in 2014 and 2,833 graduates in 2015 (Ministry of Higher Education, 2016). However, the Malaysian entrepreneurial intention (EI) rate is the second lowest among the six ASEAN countries, with only 11.6% indication, in contrast to the highest rate of 42.8% in the Philippines (UNIRAZAK, 2015). Hence, EI is still relevant to be studied to improve the status quo.

Despite the numerous studies on EI, the knowledge of the mechanisms and temporalities that affect the behaviour is still poor (Kautonen, Van Gelderen, and Tornikoski, 2013). Most studies focus on the factors affecting entrepreneurship rather than delving into personal factors (Kamariah, Yaacob, and Wan Jamaliah, 2004). Welter (2011) suggests that "economic behaviour can be better understood within its historical, temporal, institutional, spatial and social context." This study explores EI from psychological perspectives and adopts McClelland's (1961) psychological characteristic, the Need for Achievement (NA), and the Theory of Planned Behaviour (TPB) with the objective of investigating the factors influencing EI among Polytechnic students in Malaysia by using Partial Least Squares-Structural Equation Modelling (PLS-SEM). SEM is chosen due to its popularity for confirming a theoretical model, as SEM models hypothesise how sets of variables define constructs and how these constructs are related to each other (Schumacker and Lomax, 2016). Researchers like Zampetakis et al. (2009) also use SEM in conducting a test on EI.

LITERATURE REVIEW AND RESEARCH MODEL

EI

The TPB is used in intention studies (Armitage and Conner, 2001), outlining that intention is a function of three basic determinants: Attitude, Subjective Norms (SN), and Perceived Behavioural Control (PBC). In this study, intention refers to EI. A study by Bird (1988) defines EI as an individual's conscious awareness and conviction in intending to set up a new business. Another definition of EI is the degree of inclination towards entrepreneurial behaviours, such as the keenness to work as an entrepreneur (Mokhtar, Zulkifli, and Zainuddin, 2016). As intention is the best predictor of behaviour, EI is a best predictive tool to sort out entrepreneurs among graduates. Intention is considered as the most powerful predictor of entrepreneurial behaviours (Autio et al., 2001) and new venture creation (Chrisman, 1997).

NA

In this study, a psychological characteristic is adopted from the psychological characteristic school of thought. Generally, there are six; NA, Locus of Control, Tolerance of Ambiguity, Risk Taking, Self-Confidence (Begley and Boyd, 1987), and Innovativeness (Schumpeter, 1934). Past literature shows certain psychological characteristics are motivational in

becoming an entrepreneur, which are different from non-entrepreneurs. However, only NA by McClelland (1961) is discussed here. This is due to its importance (Habaragoda, 2013) and its popularity (Shaver and Scott, 1991). This variable refers to an individual's level of achievement, and could be exemplified by an independent problem solver, a target setter who strives for goals based on their own efforts, people with a higher performance in challenging tasks, and innovation in improving one's own performance (Littunen, 2000). This motivational achievement has the most important effect on EI (Dinis, Jorge, and Belinha, 2008). If the average level of NA is relatively high, then a great amount of entrepreneurship is expected (McClelland, 1961). A study by Yusof et al. (2007) shows NA is positively significant for EI. Thus, it is hypothesised that:

H1: NA has a significant positive influence on Attitude towards Entrepreneurship (ATT).

H2: NA has a significant positive influence on PBC.

H3: NA has a significant positive influence on SN.

ATT, SN, and PBC

Attitude is the most relevant TPB's construct in influencing intention. Attitude refers to the degree to which an individual has favourable/unfavourable assessments of a particular behaviour (Ajzen, 1991), which also depends on the positive/negative evaluation of the personal impacts resulting from the behaviour. A negative belief about behaviour will result in an unfavourable attitude, and vice versa, while ATT could be defined as the degree to which a person has a favourable/unfavourable appraisal of entrepreneurial behaviour (Ajzen, 2002). Norasmah and Salmah (2009) find ATT is moderately related to behaviour, and Zampetakis et al. (2009) conclude ATT has a significant effect on EI.

SN is a social factor, referring to the perceived social pressure to perform a specific behaviour (Ajzen, 2001). It is a perception of others' approval of the performance of a behaviour; for example, "my reference personnel" would approve my decision, and (in this context) my decision to be an entrepreneur. A previous study shows SN is positively related to intention (Wu and Wu, 2008).

PBC is the perception of the easiness or difficulty of carrying out a specific behaviour, or its feasibility (Peterman and Kennedy, 2003). This construct reflects a personal control over the behaviour. The greater the PBC, the stronger the intention to perform a behaviour. Several studies have shown a significant association between PBC and EI (Iakovleva and Kolvereid, 2009). In Malaysia, Ariff et al. (2010) show PBC is the most important factor influencing accounting students' EI. Following this literature, it is hypothesised that:

H4: ATT has a significant positive influence on EI.

H5: SN has a significant positive influence on EI.

H6: PBC has a significant positive influence on EI.

Self-Efficacy (SE)

SE is the individual personal judgement of one's ability to perform a specific behaviour (Krueger and Brazeal, 1994). Cromie (2000) states SE affects a person's beliefs regarding whether or not certain goals may be attained. It is similar to PBC, yet this distinct antecedent by Bandura (1986) is more important regarding intentions and actions, especially in EI studies. Ajzen further clarifies the concept of behavioural control and highlights the importance of incorporating SE and controllability items into intention measures to improve behaviour prediction. Many researchers have dealt with SE and PBC as synonymous constructs. SE has been found as an important antecedent of both EI and behaviour (Souitaris,

Zerbinati, and Al-Laham, 2007), but some researchers claim SE only concerns PBC (Rotter, 1966). Therefore:

H7: SE has a significant positive influence on PBC.

FINDINGS AND ANALYSES

Data Collection

420 questionnaires were mailed to the directors of seven selected polytechnics. The questionnaires were then distributed and completed by the students studying diplomas in accountancy, civil engineering, and electrical engineering based on the provided guidelines. Three hundred and seventy-four responses were obtained, but only 372 questionnaires were usable. Notably, this response rate of 89% is quite high. Therefore, the representatives are accepted for this study. This enables generalisation of the obtained results (Sekaran, 2003).

Measures and Assessment of Goodness of Measures

A five-point Likert scale (from 1 = strongly disagree to 5 =strongly agree) was used to measure all items. The questionnaire was designed using intensive literature. Items measuring the EI and SN were adapted from Linan et al. (2007) and Ramayah and Harun (2005); ATT items were adapted from Linan et al. (2007) and Autio et al. (1997); PBC items were adapted from Linan et al., (2007); SE items were adapted from Shcwarzer and Scholz (2000); and NA items were adapted from Ramayah and Harun (2005) and Yusof et al. (2007).

Partial Least Squares Path Modelling

The confirmatory factor analysis (CFA) tool used in this study was PLS-SEM. This technique has two components when examining latent constructs: a measurement (outer) model related to indicator loadings, and a structural (inner) model related to path coefficient measures.

Assessment of the Measurement (Outer) Model

The first step in PLS analysis is the analysis of the measurement model, used to determine the fit between the factor and the theoretically defined construct (Hair et al., 2014). It is examined to ensure the survey questionnaires do determine the variables that it was supposed to measure, simultaneously making sure that the instrument is reliable. Smart PLS M3 version 2.0 (Ringle et al., 2005) was used to analyse the data, together with the application of a bootstrapping method to fix the significant level of factor loading, composite reliability (CR), and average variance extracted (AVE). A bootstrapping method is used to simulate the drawing of several random samples from the target population (Kline, 2011).

Construct Validity

The construct validity of specific indicators can be assessed by examining the respective cross-loading and factor loading, where it has been recommended by Hair et al. (2011) that a loading of 0.50 or higher on two or more factors is considered significant. In Table 1, it is observed that all the indicators measuring a particular construct are greater than 0.50 on the particular construct, but are less than 0.50 on the other constructs, thus confirming construct validity.

Table 1: Loadings and Cross-Loadings

	ATT	EI	NA	PBC	SE	SN
ATT3	**0.874**	0.580	0.380	0.434	0.404	0.500
ATT4	**0.880**	0.556	0.382	0.378	0.405	0.514
ATT5	**0.889**	0.600	0.413	0.400	0.421	0.452
EI1	0.579	**0.839**	0.358	0.457	0.398	0.553
EI2	0.562	**0.850**	0.307	0.453	0.378	0.529
EI3	0.539	**0.850**	0.294	0.460	0.372	0.528

EI4	0.530	**0.836**	0.303	0.495	0.398	0.522
EI5	0.516	**0.799**	0.346	0.377	0.378	0.434
EI6	0.330	**0.618**	0.108	0.356	0.227	0.400
EI7	0.527	**0.826**	0.317	0.412	0.387	0.513
EI8	0.561	**0.846**	0.322	0.438	0.379	0.474
EI9	0.571	**0.736**	0.297	0.432	0.371	0.400
NA1	0.305	0.281	**0.755**	0.310	0.510	0.262
NA2	0.383	0.314	**0.860**	0.285	0.539	0.337
NA3	0.357	0.229	**0.860**	0.277	0.517	0.245
NA4	0.416	0.367	**0.865**	0.363	0.528	0.321
NA5	0.384	0.348	**0.829**	0.336	0.588	0.276
PBC3	0.306	0.435	0.247	**0.838**	0.347	0.355
PBC4	0.475	0.498	0.396	**0.898**	0.455	0.543
SE1	0.322	0.390	0.501	0.414	**0.809**	0.310
SE2	0.396	0.404	0.513	0.412	**0.853**	0.365
SE3	0.405	0.366	0.595	0.425	**0.865**	0.369
SE4	0.389	0.359	0.470	0.328	**0.779**	0.320
SE5	0.409	0.359	0.555	0.308	**0.785**	0.299
SN1	0.378	0.466	0.186	0.381	0.219	**0.768**
SN2	0.386	0.444	0.200	0.387	0.261	**0.797**
SN3	0.462	0.519	0.328	0.446	0.337	**0.826**
SN4	0.483	0.476	0.328	0.423	0.377	**0.814**
SN5	0.494	0.537	0.287	0.447	0.361	**0.821**
SN6	0.464	0.483	0.329	0.459	0.399	**0.825**

Note: Bold values are loadings for items above the recommended value (0.50).

Convergent Validity

Convergent validity is the degree to which multiple items that measure the same concept are in agreement. Factor loadings, CR and AVE, can be used to assess convergent validity (Hair et al., 2011). CR was obtained from the factor loadings of the constructs and its value in the observed variable that was accounted for by the latent variables. In Table 2, all the CR values obtained are within the range of 0.860 to 0.942, which exceeds the recommended value (0.70). CR values of 0.70 to 0.90 are considered reliable (Hair et al., 2011). Another measurement to be examined is AVE, which reflects the complete amount of variance in the observed variable accounted for by the latent variable relative to measurement error (Ramayah et al., 2013). Again, in Table 2, all AVE values lie between 0.645 to 0.776, which is higher than the minimum recommended value of 0.50 (Barclay et al., 1995). This means all the constructs used are valid measures of the respective constructs according to the parameter estimates and statistical significance.

Table 2: Result of Measurement (Outer) Model

Constructs	**Items**	**Loadings**	**CR[a]**	**AVE[b]**
Attitude	ATT3	0.874	0.912	0.776
	ATT4	0.880		
	ATT5	0.889		
Entrepreneurial Intention	EI1	0.839	0.942	0.645
	EI2	0.850		
	EI3	0.850		

	EI4	0.836		
	EI5	0.799		
	EI6	0.618		
	EI7	0.826		
	EI8	0.846		
	EI9	0.736		
NA	NA1	0.755	0.920	0.697
	NA2	0.860		
	NA3	0.860		
	NA4	0.865		
	NA5	0.829		
PBC	PBC3	0.838	0.860	0.755
	PBC4	0.898		
SE	SE1	0.809	0.910	0.670
	SE2	0.853		
	SE3	0.865		
	SE4	0.779		
	SE5	0.785		
SN	SN1	0.768	0.919	0.654
	SN2	0.797		
	SN3	0.826		
	SN4	0.814		
	SN5	0.821		
	SN6	0.825		

Note: [a]Composite reliability (CR)=(square of the summation of the factor loadings)/{(square of the summation of the factor loadings)+(square of the summation of the error variances). [b]Average variance extracted (AVE)=(summation of the square of the factor loadings)/{(summation of the square of the factor loadings)+(summation of the error variances)}.

Discriminant Validity

Discriminant validity is the degree to which items differentiate among constructs or measure distinct concepts, and this was conducted by calculating and investigating the associations among the measures of possibly overlapping variables (Ramayah, Rouibah and May, 2011), and can be assessed by examining the correlations between the measures of potential overlapping construct. The AVE for each component should be greater than the squares of the correlation between the components and all other components (Christmas, 2005). On the other hand, the research model is considered to have a good discriminant when the correlation among the components is lower than the square root of the AVE (Fornell and Larcker, 1981). Table 3 shows that all the AVE are greater than the recommended value, and the correlations for every latent variable are less than the square roots of AVE (shown in bold). Thus, discriminant validity is acceptable.

Table 3: Discriminant Validity

Constructs	A	B	C	D	E	F
Attitude (A)	**0.881**					
EI (B)	0.658	**0.803**				
NA (C)	0.445	0.373	**0.835**			
PBC (D)	0.459	0.539	0.378	**0.869**		
SE (E)	0.466	0.459	0.643	0.467	**0.819**	

SN (F)	0.554	0.605	0.348	0.526	0.408	**0.809**

Note: Diagonal represents the square root of the AVE, while the off-diagonals represent the correlations among the variables.

Assessment of the Structural (Inner) Model

As a whole, the measurement model demonstrated adequate convergent validity and discriminant validity. Therefore, the next step in PLS analysis is to develop a structural model by analysing the inner model, which can be used to assess the relationships between construct, R^2, and the significant values of the research model. The loading among the components was tested for the significance of path parameter coefficient using R^2 for endogenous variables and t-statistics. To test the significance, the data was run using 5000 bootstrapped samples through 372 cases. For a specified PLS model, the R-squares for each dependent latent variable in the structural model provided by PLS are first calculated, in which case the values of the latent variables are determined by the weight relations (Vinzi, 2010).

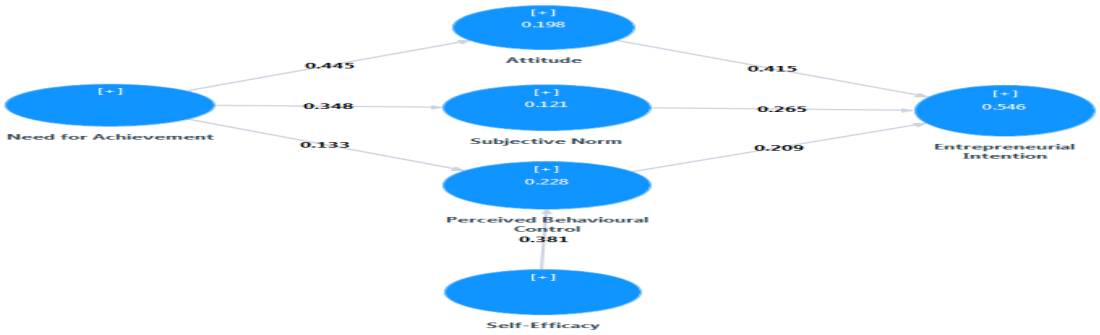

Figure 1: *Assessment of the Structural (Inner) Model on the Hypothesised Framework*

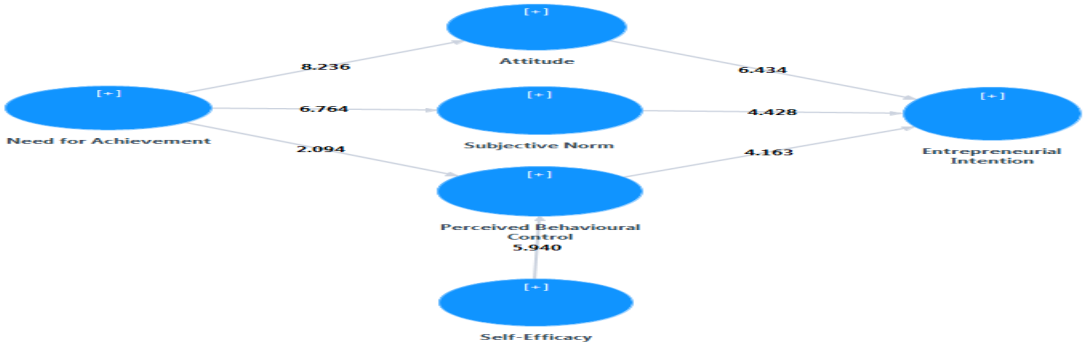

Figure 2: *Bootstrapping Analysis of the Structural (Inner) Model*

Path Coefficients

The path coefficients are also used to evaluate the structural (inner) models. The path coefficients or model loadings are evaluated in terms of sign, magnitude, and significance; and are interpreted as in regression analysis and equivalent to the standardised beta weights (β) (Henseler et al., 2009). The path coefficients indicate the strength and the direction of the causal links between latent constructs. Thus, the path coefficients that do not match to the algebraic sign of the theoretical expectations do not support the hypotheses.

The path coefficient significant level is determined by examining the path loadings between construct; that is identified by using the t-statistics. The t-statistics were estimated

using the bootstrap resampling procedure. The bootstrapping procedure is a non-parametric approach for estimating the precision of the PLS-SEM estimates (Henseler et al., 2009). Bootstrapping results suggest the stability of the PLS-SEM estimates. In this study, all the data was run using 5,000 bootstrapped samples, with the same number of cases as original sample, following the method conducted by Navarro et al. (2000).

Figure 1 and Figure 2 reveal that all regression weights values are of practical importance (beta values > 0.2) and statistically significant at a significance level of 0.01. The direction of the hypothesis is also positive and in tandem with the proposed hypotheses, as discussed in the literature review.

Coefficient of Determination (R^2)

Regarding the amount of variance in each construct which are described by the model, the squared multiple correlation (R^2) coefficients of determination for each construct were examined. The coefficient of determination (R^2) of the endogenous latent construct explains the predictive power of the structural model and the effect level of the latent constructs. The R^2 is to assess the proportion of the variance in the endogenous constructs that can be accounted for by the exogenous constructs (Hair et al., 2011) and are interpreted in the same manner as R^2 values obtained from the regression analysis (Casey and Wilson-Evered, 2012). As a rule of thumb, in marketing research studies, R^2 values of 0.75, 0.50, or 0.25 can be described as substantial, moderate, or weak respectively (Hair et al., 2011).

In general, the hypothesised model describes the statistically significant amount of variance for each construct. In this study, the R^2 value for EI is 0.546, which implies that 54.6% of EI is predicted by ATT, SN, PBC, and SE. Also, the R^2 for PBC is 0.228, which means that 22.8% of this construct is explained by latent constructs of SE and NA. In addition, 20% of Attitude and 12.1% of SN are explained by NA respectively. Overall, the proportion of variance explained by each endogenous constructs from exogenous constructs is acceptable.

Hypotheses Testing of PLS-SEM

In many research situations, the advantageous properties of variance-based PLS-SEM method were to estimate SEM (Lohmöller, 1989). In short, the hypothesised relationships in the SEM were tested using PLS estimation. It is clearly shown that all hypotheses were supported (refer Table 4). All relationships were significant at $p<0.01$.

Table 4: Path Coefficient and Hypotheses Testing of PLS-SEM

Hypotheses	Relationships	Beta	S.E.	t-value	p-values	Decisions
H1	NA -> ATT	0.445	0.054	**8.236	0.000	Supported
H2	NA -> PBC	0.133	0.064	*2.094	0.036	Supported
H3	NA -> SN	0.348	0.051	**6.764	0.000	Supported
H4	ATT -> EI	0.415	0.065	**6.434	0.000	Supported
H5	SN -> EI	0.265	0.060	**4.428	0.000	Supported
H6	PBC-> EI	0.209	0.050	**4.163	0.000	Supported
H7	SE -> PBC	0.381	0.064	**5.940	0.000	Supported

**p<0.01 (2-tailed), *p<0.05

CONCLUSION

This study investigated the factors influencing EI among polytechnic students in Malaysia. As discussed, there is an improvement in the number of graduates who became entrepreneurs, yet Malaysian graduates' level of EI is the lowest compared to other regional neighbours. This is perhaps due to graduates' dependency on the government and private organisations

for jobs. It is still relevant to further examine whether Malaysian polytechnic students are inclined and oriented towards the entrepreneurial sphere.

The study had used PLS-SEM to test the hypothesised framework. The seven hypothesised relationships were tested using PLS estimation. All relationships are significant, and the entire hypotheses are supported. This method validated the results in the final model, as suggested in the analysis of the impact of exogenous latent variables (i.e., NA and SE) on Attitude, SN, and PBC on the EI. The use of a latent variable in SEM provides a strong test for the relationship between ATT, SN, and PBC and EI. The variables achieve a very good reliability of indicators to measure the latent variables. Moreover, all coefficient paths are significant at level $p < 0.001$. In conclusion, the results show that the proposed factor structure provides an adequate statistical fit and is sufficient for the data. In common with Gird and Bagraim (2008), this study shows that Attitudes, SN, and PBC revealed a significant statistical influence on EI. This finding is in line with Ramayah and Zainon (2005) in which the variable, SNis significant on intention. The finding, therefore, suggests TPB is a valuable tool for predicting EI. The study also pointed out that NA has a significant positive influence on Attitudes, SN, and PBC. This is in line with Nayyar and Nishantha (2010), who posited that individuals with a high NA are more likely to have a positive attitude toward entrepreneurship. It is also concluded that SE has a positive and significant impact on PBC. A similar conclusion was reached by Krueger, Reilly, and Carsrud (2000), who tested an EI model adapted from Ajzen (1987).

In conjunction with this research results, it is recommended that the Department of Polytechnic Education offer more entrepreneurship programmes and courses to the students. This would help the students gain the knowledge and skills required in entrepreneurial activities, while indirectly building their confidence to own a business. This will improve the students' PBC towards entrepreneurship, which might subsequently influence their intention to become entrepreneurs. It is suggested that future studies adopt this model and replace the variable NA with other psychological characteristics, such as Self-Confidence.

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