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THE EFFECTS OF ENTREPRENEURSHIP EDUCATION ON STUDENTS' ENTREPRENEURIAL INTENTIONS AT A SOUTH AFRICAN UNIVERSITY OF TECHNOLOGY

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ABSTRACT

This study evaluated the effects of entrepreneurship education on students' entrepreneurial intentions using the theory of planned behaviour at the Tshwane University of Technology in South Africa. A cross-sectional quantitative research approach based on convenience sampling method was adopted for the study, involving a total of 301 first, second and third-year entrepreneurship students who completed an online survey questionnaire. The study's conceptual model was tested using partial least-squares structural equation modelling in RStudio. Microsoft Excel and IBM SPSS v26 were used for descriptive statistics. The findings generated from the PLS-SEM model showed that entrepreneurship education had a statistically significant influence on entrepreneurial intentions and perceived behavioural control.

Perceived effects of entrepreneurship education had a statistically significant effect on perceived behavioural control, subjective norms and attitude towards behaviour, and an insignificant direct effect on entrepreneurial intentions. The relationship between entrepreneurial intentions and perceived effects of entrepreneurship education was fully mediated by perceived behavioural control, subjective norms and attitude towards behaviour. The findings further revealed that perceived behavioural control, subjective norms, and attitude towards behaviour had a statistically significant influence on entrepreneurial intentions. The findings add to the advancement of the theory of planned behaviour and the field of entrepreneurship education.

Keywords: Entrepreneurship Education, Theory of Planned Behaviour, Entrepreneurial Intentions, Perceived Effects of Entrepreneurship Education.

INTRODUCTION

Entrepreneurship has become increasingly important as a solution for economic problems, particularly related to rising unemployment rates (García-Rodríguez et al., 2017; Rahim & Mukhtar, 2021). Hence academics and policymakers consider entrepreneurship as a catalyst for economic growth, development and productivity (Schwartz & Malach-Pines, 2009; De Wit & De Kok, 2014). In realization of these benefits, higher education institutions have started providing entrepreneurship education from undergraduate to doctoral levels with the belief that doing so will help stimulate the economy and contribute to job creation through new

start-ups (Alanazi, 2018; Byun et al., 2018; Nade & Malamsha, 2021; Chimucheka, 2014). While unemployment has become a constant problem in South Africa for all age categories of the labour force at a rate of 32.6%, the youth are severely affected with the unemployment rate of between 41.3% and 63.3% (Statistics South Africa, 2021). Consequently, encouraging the youth to become self-employed and equipping them with the necessary entrepreneurial skills and competencies is vital to turn this situation around. This requires exposing the youth to entrepreneurship education as there is some consensus that people can be taught to behave entrepreneurially (Kuratko, 2005; Henry et al., 2005; Haase & Lautenschläger, 2011).

Entrepreneurship education, however, should not just make the youth aware of the entrepreneurial career option but should instill the mindset, attitudes, develop the knowledge, skills and abilities to identify, evaluate and exploit opportunities in the market (Jones & English, 2004; Ayou et al., 2017; Wardana et al., 2020). By doing so entrepreneurship education will facilitate the choice for an entrepreneurial career option, opportunity recognition and the formation of intentions to start a business (Vidal-Suñé & López-Panisello, 2013). Individuals are more likely to intend to start new businesses and engage in activities aimed at launching new ventures when they are confident in their own skills and abilities, and are able to recognise opportunities in the market (Arenius & Minniti, 2005; Vidal-Suñé & López-Panisello, 2013; Bayon et al., 2015; Tsai et al., 2016; Aparicio et al., 2021). Prior research reveals that entrepreneurship education increases the likelihood of being self-employed (Galloway & Brown, 2002; Jones et al., 2017), improves the knowledge and skills of entrepreneurs, and leads to the creation of new ventures and improvement in the performance of existing ventures (Botha et al., 2007; Dickson et al., 2008; Chimucheka, 2012; Martin et al., 2013). Exposure to entrepreneurship education can enhance the ability of students to start and operate their own businesses after graduation (Charney & Libecap, 2000).

Moreover, since entrepreneurial intention influences entrepreneurial behaviour (Rauch & Hulsink, 2015; Kautonen et al., 2015; Yaseen et al., 2018), entrepreneurship education could be a crucial intervention for stimulating entrepreneurial intention and changing its antecedents (Ajzen, 2011; Steinmetz et al., 2016). To ensure its relevance and effectiveness, entrepreneurship education can be evaluated using the impact it has on entrepreneurial intention and its antecedents, as the act of creating a new venture is deliberate and purposeful in nature (Krueger et al., 2000). This means that entrepreneurship education should not only make the entrepreneurial career choice desirable but should enhance the capability to act entrepreneurially. According to Bandura (1986), individuals are less likely to engage in activities in which they are less capable of being successful despite the cherished benefits of the behaviour. By strengthening both intentions and capabilities, entrepreneurship education is more likely to contribute to entrepreneurial activity (Ajzen, 2005; Rauch & Hulsink, 2015; Kautonen et al., 2015). As a result, over the past 20 years there has been a tremendous increase in the volume of research focusing on the effects of entrepreneurship education on entrepreneurial intention in both developed and developing countries (for example, Kolvereid & Moen, 1997; Noel, 2002; Peterman & Kennedy, 2003; Liñán, 2004; Fayolle et al., 2006; Bae et al., 2014; Fayolle & Gailly, 2015; Rauch & Hulsink, 2015; Malebana, 2016a; Nabi et al., 2018; Bux & van Vuuren, 2019; Ndofirepi & Rambe, 2017; Mahmoud et al., 2020; Nade & Malamsha, 2021).

Investigating the effects of entrepreneurship education could help support the efforts of encouraging entrepreneurship in South Africa and ultimately, result in the development and implementation of interventions that could solve the country's economic growth and employment creation challenges. This study examines, based on the theory of planned behaviour

(TPB), the effects of entrepreneurship education on entrepreneurial intentions of students at the Tshwane University of Technology.

LITERATURE REVIEW

The literature review for this study focuses on the role of the TPB in the evaluation of the effects of entrepreneurship education (EE). In addition, the perceived learning from entrepreneurship education and the relationship with entrepreneurial intention (EI) and its antecedents are discussed.

Intention Models as Tools for Evaluating the Effects of Entrepreneurship Education

Since early 2000, entrepreneurial intention models have become popular among researchers as frameworks for evaluating the impact of EE (Peterman & Kennedy, 2003; Liñán, 2004; Fayolle, 2005; Byabashaija & Katono, 2011; Hattab, 2014; Salisu, 2020). However, the TPB has emerged as the most dominant model that has been used to assess the effect of EE. This predominance can be attributed in part to the assertion that the TPB can be a valuable tool for assessing EE programmes and for measuring changes in EI and its antecedents (Fayolle, 2005; Fayolle et al., 2006). As an intervention, EE can be designed and evaluated based on its effectiveness in changing the beliefs and antecedents that influence intentions, and ultimately the impact on behaviour (Ajzen, 2011; Steinmetz et al., 2016).

According to the TPB, intention directly influences the behaviour, and is determined by attitude towards behaviour (ATB), perceived behavioural control (PBC) and subjective norms (SN) (Ajzen, 2005; 2012). This theory suggests that individuals intend to perform the behaviour when they evaluate the behaviour and its outcomes favourably, when they are capable of performing the behaviour, and when they think others in their close environment will support their decision to engage in the behaviour. A large number of studies globally have supported the utility of the TPB for prediction of EI, despite the varying effects of the theoretical determinants of intention (for example, Mueller, 2011; Malebana, 2014; Kautonen et al., 2015; Mothibi & Malebana, 2019; Otuya et al., 2008; Basu & Virick, 2008). However, some studies could not find support for the effects of SN on EI (Lopez et al., 2021; Ndofirepi & Rambe, 2017; Linan & Chen, 2009; Wu & Wu, 2008) while others found that SN and PBC do not have a significant relationship with EI (Otache et al., 2019; Mahmoud et al., 2020).

Prior research has shown that the effect of EE on EI and its antecedents varies between males and females (Shinnar et al., 2014; Walter et al., 2013) and also based on the duration of the programme (Fayolle & Gailly, 2015; Malebana, 2016a; Fayolle et al., 2006). It has also been shown that EE impacts EI and its antecedents differently depending on the samples being studied. For example, in the African context, it has been found that EE is positively related to EI, ATB, SN and PBC (Otache et al., 2019). Additionally, Boukamcha (2015) reports the positive influence of EE on entrepreneurial self-efficacy, perceived desirability and feasibility of entrepreneurship. Similarly, Akinbode et al. (2018) observed a positive relationship between entrepreneurship education, attitude, entrepreneurial self-efficacy and intention. In Ethiopia, Gerba (2012) reports significant differences in attitude, subjective norms and self-efficacy between students who attended an entrepreneurship course and those who did not. In South Africa, Malebana (2016a) found that long-term exposure to EE rather than the short-term is vital to enhance EI and its three antecedents while Bux & van Vuuren (2019) confirm the positive impact of long-term exposure to EE on entrepreneurial self-efficacy. In Botswana EE had a

significant influence on attitude and PBC (Ebewo et al., 2017). Hattab (2014) reveals that EE leads to higher EI and the desirability of creating a new venture but not perceived feasibility of entrepreneurship among Egyptian students, while in Uganda, Byabashaija & Katono (2011) report the positive effects on perceived desirability and feasibility. Surprisingly, in Nigeria Mahmoud et al. (2020) could not find a significant relationship between EE and EI and neither could the moderation effects of entrepreneurship education be confirmed.

In some studies EE had a stronger effect on EI than attitude and self-efficacy (Matsheke & Dhurup, 2017) while in others it had a negative impact (Malebana; 2016b; Lima et al., 2015), had no effect (Fems et al., 2020) or was insignificant (Egerová et al., 2017; Malebana & Zindiye, 2017; Ndofirepi & Rambe, 2017). Furthermore, there are mixed results on whether exposure to EE leads to differences in EI among those who attended it and those who did not (Nabi et al., 2018; Mbuya & Schachtebeck, 2016; Wu & Wu, 2008).

In other countries, it has been found that EE enhances the formation of EI and entrepreneurial self-efficacy (Hoang et al., 2021; Utami, 2020), and positively influences EI and its three antecedents (Zhang et al., 2019). Rauch & Hulsink's (2015) findings show the positive effect of EE on EI, attitude, PBC and entrepreneurial behaviour. In addition, EE was found in other studies to have a positive effect on attitude and PBC (Basu & Virick, 2008).

In order to have a positive impact on entrepreneurial intention and its antecedents, researchers suggest that experiential teaching methods should be adopted for EE to enable students to experiment with entrepreneurship (Mueller, 2011; Uike, 2019; Krisakorn et al., 2018; Nabi et al., 2018; Piperopoulos & Dimov, 2015; Sherman et al., 2008). By so doing, the attractiveness of the entrepreneurial career option, perceived capability for starting a business and entrepreneurial intention would be enhanced. This means that entrepreneurship educators should move away from the dominant lecturing method as reported by recent studies (Ndofirepi & Rambe, 2018; Rankhumise et al., 2020), to experiential learning which is student-centered, discovery-oriented, and facilitates learning that is aimed at executing the entrepreneurial process (Sherman et al., 2008; Heinonen & Poikkijoki, 2006; Corman et al., 2005). Thus, it is hypothesised that:

H1: EE has a statistically significant relationship with students' EI.

H2: EE has a statistically significant relationship with students' ATB.

H3: EE has a statistically significant relationship with students' SN.

H4: EE has a statistically significant relationship with students' PBC.

Perceived Effects of Entrepreneurship Education and the Formation of Entrepreneurial Intention

EE can further be assessed by considering students' perceptions of learning from the programme, herein referred to as the perceived effects of entrepreneurship educations (PEE) (Zhao et al., 2005; Souitaris et al., 2007). PEE can include aspects such as entrepreneurial cognitions, nurturing creativity and innovation abilities, development of entrepreneurial skills and mechanisms for coping with environmental uncertainty, opportunity recognition, and provision of knowledge on how to start and manage a business (Franke & Lüthje, 2004; Souitaris et al., 2007; Keat et al., 2015; Abdurashed et al., 2019; Wei et al., 2019; Chen et al., 2020; Bian et al., 2021; Lopez et al., 2021). Prior research has shown that perceived effective EE stimulates creativity and innovative ability (Wei et al., 2019; Keat et al., 2015). Thus, students' perceptions

of learning from EE can shape the formation of entrepreneurial intention and impact positively on its antecedents. For example, such perceptions of learning are associated with entrepreneurial self-efficacy (Zhao et al., 2005). In a study that developed and tested a model to explain the relationship between students' perceptions of learning from EE and EI, it was found that PEE is positively related to EI, ATB, SN and PBC (Lopez et al., 2021). Additionally, Rengiah (2013) and Nasiru et al. (2015) discovered that PEE had a statistically significant direct relationship with EI. On the contrary, Souitaris et al. (2007) could not find a significant relationship between perceived learning from entrepreneurship courses and entrepreneurial intention, attitude, subjective norm and perceived behavioural control. Therefore, it is hypothesised that:

- H5* PEE has a statistically significant relationship with students' EI.
H6 PEE has a statistically significant relationship with students' ATB.
H7 PEE has a statistically significant relationship with students' SN.
H8 PEE has a statistically significant relationship with students' PBC.

The proposed research model shown below in Figure 1 was drawn from Ajzen's (2012) TPB, which was modified to accommodate the possible role that EE and its perceived effects play in stimulating students' EI. The model illustrates the variables on which this study was based and shows the relationship between these variables. PBC, SN and ATB were regarded as the mediating variables, while EI was considered as the dependent variable. The proposed model suggests that the two independent variables, namely, EE and perceived effects of entrepreneurship education have an effect on EI, mediated by PBC, SN and ATB.

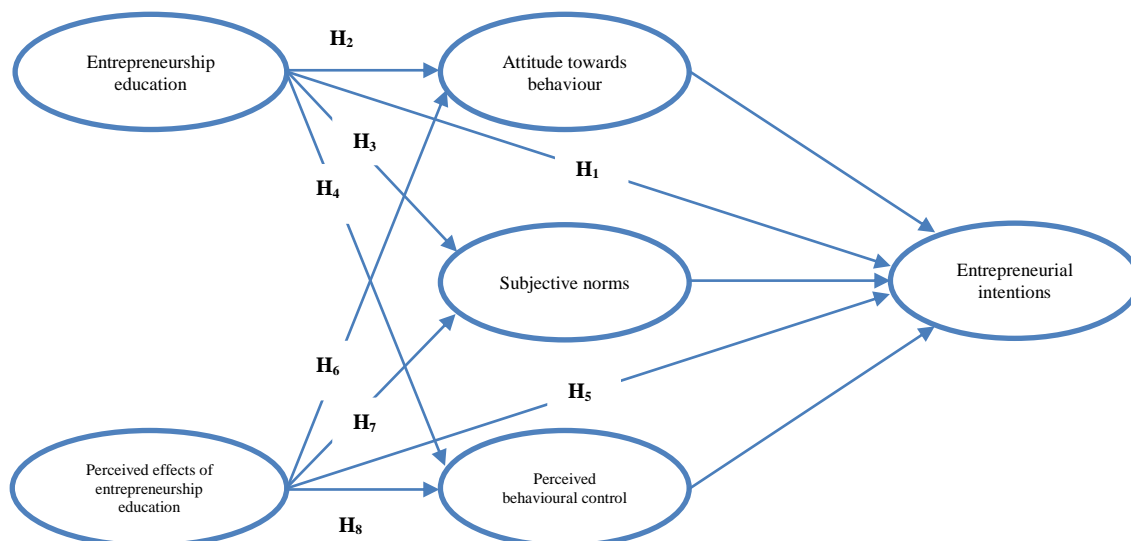


FIGURE 1
CONCEPTUAL MODEL

METHODOLOGY

A quantitative research approach was employed in this study. Quantitative research was chosen because it allows for the quantification of behaviour, opinions, attitudes, and other variables, as well as the generalization of findings across a larger population. A descriptive survey research design that is cross-sectional in nature was also utilized.

Population and Sampling

The population of this study consisted of 1003 first, second and third-year entrepreneurship students enrolled at the Tshwane University of Technology in the year 2020. Out of that number, a convenience sample of 301 students, who were willing to part take in the study completed the online survey questionnaire.

Research Instrument and Data Collection

Data were collected using a structured online survey questionnaire adopted from previous validated EI questionnaires (Liñán & Chen, 2009; Malebana, 2012). Questions on PEE were adopted from Rengiah (2013) and Souitaris et al. (2007). A five-point Likert scale was used to measure EI, its antecedents and PEE (1=strongly disagree to 5=strongly agree). Demographic questions were adopted from Malebana (2012) and were measured using nominal scale type of questions (1=Male, 2=Female and 3=Not disclosed; 1=Yes and 2=No). Data collection took place after obtaining ethical clearance from the Tshwane University of Technology Research Ethics Committee. The data collection process began when the researchers were granted the permission to distribute the online survey questionnaire using a google forms survey hyperlink through WhatsApp Messenger. The entrepreneurship educator at the Tshwane University of Technology facilitated the data collection process by providing the researchers with contact details of class representatives, which helped the researchers to gain access into the three WhatsApp Messenger groups consisting of all targeted entrepreneurship students, and also encouraged students to participate in the study. To increase the response rate, which is a problem for online surveys, the researchers reposted the online survey questionnaire on a daily basis for a period of three weeks on WhatsApp Messenger groups.

DATA ANALYSIS AND RESULTS

Data analysis was conducted using PLS-SEM (Sanchez, 2013) in RStudio, Statistical Product and Service Solution (SPSS) v26 and Microsoft Excel. Descriptive statistics were used for the sample characteristics while PLS-SEM was used to test the relationship between the independent variables, mediating variables and dependent variables. Specifically, the relationships as hypothesised (H1-H8) in the conceptual model (Figure 1) were tested using the PLS-SEM.

Profile of the Respondents

Table 1 indicates that a total of 148 (49.2%) male and 135 (44.9%) female respondents participated in the study, and 18 (6%) respondents did not disclose their gender. In terms of age, the majority (42.9%) of the respondents were between 21 and 23 years old, followed by 31.2% in the 18-20 age group, and 25.9% who were 24 years old and above. With regard to their current levels of study, approximately 31.2% were first-year students, 34.2% were second-year students, and 34.6% were third-year students.

Variables	Description	Frequency	Percentage
Gender	Male	148	49.2
	Female	135	44.9
	Not Disclosed	18	6
	Total	301	100
Age	18 – 20	94	31.2
	21 – 23	129	42.9
	24 – Above	78	25.9
	Total	301	100
Entrepreneurship education level of study	First year	94	31.2
	Second year	103	34.2
	Third year	104	34.6
	Total	301	100

Measurement Model Assessment

PLS-SEM was used to analyze the measurement model of this research. For the assessment of the measurement model, Cronbach's alpha, composite reliability, average variance extracted, convergent validity and discriminant validity were examined. Cronbach's alpha, composite reliability, average variance extracted scores are shown in Table 2. Hair et al. (2017) indicate that in order for constructs in scales to be considered reliable, they should have Cronbach alpha scores greater than 0.7. All the variables of this study had Cronbach alpha scores that were above 0.7, denoting that the six constructs had acceptable reliability scores.

Furthermore, the composite reliability values for the measurement model should be greater than 0.8 (Hair et al., 2017), of which in this study they were all higher than 0.8. The composite reliability scores for all of the variables in this research were higher than 0.8. Average variance extracted is a metric for determining convergent validity (Ravand & Baghei, 2016). Adequate convergent validity is reached when the average variance extracted value of a construct is at least 0.5 (Fornell & Larcker, 1981). All the variables in this research had average variance extracted values that were above 0.5, indicating adequate convergent validity.

Variables	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Entrepreneurship Education	1.000	1.000	1.000
Perceived Effects of Entrepreneurship Education	0.887	0.922	0.747
Attitude Towards Behaviour	0.884	0.913	0.634
Subjective Norms	0.889	0.915	0.639
Perceived Behavioural Control	0.904	0.922	0.568
Entrepreneurial Intentions	0.913	0.932	0.664

Discriminant validity is measured by the Fornell-Larcker Criterion (Fornell & Larcker, 1981). The square root of the AVEs should be higher than the correlation between one construct and the other constructs' items, which according to Table 3 confirm the discriminant validity in this study (Ravand & Baghei, 2016; Hair et al., 2017).

Table 3
DISCRIMINANT VALIDITY (FORNELL-LARCKER CRITERION)

Construct	EE	PEE	ATB	SN	PBC	EI
Entrepreneurship Education	1.000					
Perceived Effects of Entrepreneurship Education	0.081	0.864				
Attitude Towards Behaviour	0.099	0.714	0.796			
Subjective Norms	0.074	0.405	0.406	0.799		
Perceived Behavioural Control	0.138	0.691	0.667	0.366	0.754	
Entrepreneurial Intentions	0.187	0.664	0.783	0.431	0.683	0.815

Structural Model Assessment

The coefficient of determination (R^2) was employed in the measurement of the model's predictive power and is calculated as the squared correlation between a specific endogenous construct's actual and predicted values. Hair et al. (2017) considered R^2 values of 0.75, 0.50, and 0.25 for the dependent variables as substantial, moderate and weak, respectively. The results from the coefficient of determination (R^2) revealed that EI had an R^2 value of 0.679. This means that PEE, SN, PBC, EE and ATB accounted for 68% of the variation in EI. This could be considered as moderate. ATB had an R^2 value of 0.512, which means that EE and PEE explained 51.2% of the variance in ATB. This could also be considered as moderate. SN had an R^2 value of 0.166, which means that EE and PEE explained 17% of the variation in SN. This could be considered as weak. PBC had an R^2 value of 0.485, which means that EE and PEE accounted for 49% of variance in PBC, which could also be considered as weak.

PLS-SEM using RStudio was utilized to test the hypothesized model that allowed the researchers to test all the hypotheses. The results in Table 4 indicate that EE had a significant positive relationship with PBC ($\beta=0.083$, $p < 0.05$) and EI ($\beta=0.089$, $p < 0.01$) but not with SN and ATB. This means that when EE increased PBC and EI also increased. These results provide support for H1 and H4, while H2 and H3 are rejected.

Table 4
PATH COEFFICIENTS (P-VALUE)

Relationship	Path coefficients	Standard error	T-value	p-value
EE → ATB	0.0414	0.0406	1.0200	0.3090
EE → SN	0.0417	0.0531	0.7860	0.4330
EE → PBC	0.0828	0.0417	1.9800	0.0482*
EE → EI	0.0894	0.0333	2.6900	0.0077**

Findings in Table 5 show that PEE had a statistically significant positive relationship with ATB ($\beta=0.711$, $p < 0.001$), SN ($\beta=0.401$, $p < 0.001$) and PBC ($\beta=0.685$, $p < 0.001$). No significant relationship was found between PEE and EI. The results suggest that PEE enhances ATB, SN and PBC.

The results (Table 6) show that ATB ($\beta=0.520$, $p < 0.001$), SN ($\beta=0.094$, $p < 0.01$) and PBC ($\beta=0.225$, $p < 0.001$) have a significant positive effect on EI. This suggests that the three variables of the TPB play a significant role in the formation of EI. The results fully supported the TPB as a model for predicting students' EI, with ATB having the most significant effect on EI, followed by PBC and SN. Thus, the TPB could be considered as a useful framework for assessing students' EI at the Tshwane University of Technology.

Table 5
PATH COEFFICIENTS (P-VALUE)

Relationship	Path coefficients	Standard error	T-value	p-value
PEE → ATB	0.7110	0.0406	17.500	0.0000***
PEE → SN	0.4010	0.0531	7.5600	0.0000***
PEE → PBC	0.6850	0.0417	16.400	0.0000***
PEE → EI	0.0916	0.0522	1.7600	0.0802

Table 6
PATH COEFFICIENTS (P-VALUE)

Relationship	Path coefficients	Standard error	T-value	p-value
ATB → EI	0.5200	0.0507	10.300	0.0000***
SN → EI	0.0936	0.0368	2.5400	0.0115**
PBC → EI	0.2250	0.0490	4.6100	0.0000***

Structural Model

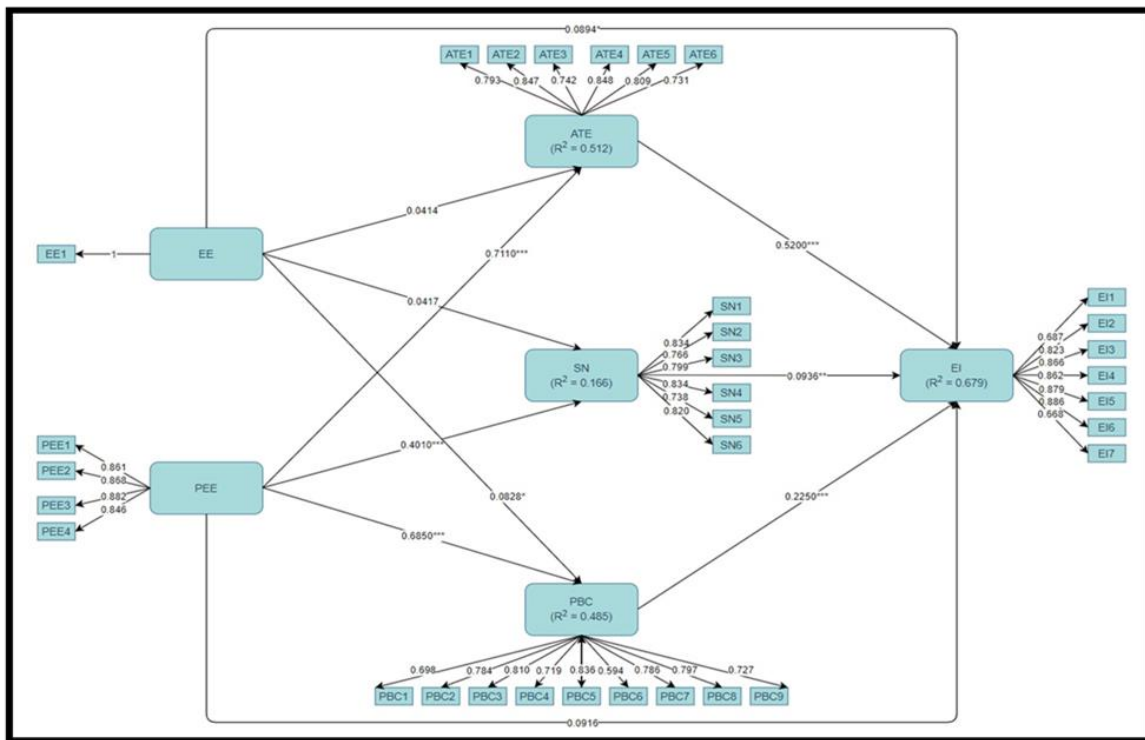


FIGURE 2
STRUCTURAL MODEL OUTPUT

A summary of the findings of the hypotheses test and structural model assessment is shown in Table 7. The results indicate that EE had a statistically significant positive relationship with PBC and EI while PEE had a statistically significant positive relationship with ATB, PBC and SN. As a result, hypotheses H1, H4 H6, H7 and H8 were accepted at a p<0.05 significance level, and H2, H3 and H5 were rejected at a p>0.05 significance level.

Table 7
SUMMARY OF STRUCTURAL MODEL ASSESSMENT

Hypothesized path	Hypothesis	Path coefficient	Standard error	T-value	p-value	Level of significance
EE → EI	H ₁	0.0894	0.0333	2.6900	0.0077	**
EE → ATB	H ₂	0.0414	0.0406	1.0200	0.3090	n.s.
EE → SN	H ₃	0.0417	0.0531	0.7860	0.4330	n.s.
EE → PBC	H ₄	0.0828	0.041	1.9800	0.0482	*
PEE → EI	H ₅	0.0916	0.0522	1.7600	0.0802	n.s.
PEE → ATB	H ₆	0.7110	0.0406	17.500	0.0000	***
PEE → SN	H ₇	0.4010	0.0531	7.5600	0.0000	***
PEE → PBC	H ₈	0.6850	0.0417	16.400	0.0000	***

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Mediation Analysis

This study adopted the Sobel test (Koopman et al., 2014) mediation analysis approach to determine whether ATB, SN and PBC mediated the effects of EE and PEE on EI. Koopman et al. (2014) recommended using the Sobel test over bootstrapping to determine the strength and significance of mediation analysis. The results in Table 8 indicate that PBC ($\beta=0.0186$, $p < 0.05$) mediated the relationship between EE and EI. This was a partial mediation because EE had a significant direct effect on EI. ATB ($\beta=0.0022$, $p > 0.05$) and SN ($\beta=0.0039$, $p > 0.05$) were insignificant in mediating the relationship between EE and EI, with a significance level of $p > 0.05$.

Table 8
MEDIATION ANALYSIS EE EFFECTS

Hypothesized path	Direct relationship	Indirect relationship	p-value	Mediation
EE → ATB → EI	0.0414	0.0022	0.468	n.s.
EE → SN → EI	0.0417	0.0039	0.335	n.s.
EE → PBC → EI	0.0828	0.0186	0.034	Partial mediation

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The results in Table 9 show that ATB ($\beta=0.3697$, $p < 0.001$), SN ($\beta=0.0375$, $p < 0.01$) and PBC ($\beta=0.1541$, $p < 0.001$) mediated the relationship between PEE and EI. This was a full mediation because PEE had an insignificant direct effect on EI. Therefore, hypotheses H6, H7 and H8 are confirmed by the results while H5 is rejected.

Table 9
MEDIATION ANALYSIS PEE

Hypothesized path	Direct relationship	Indirect relationship	p-value	Mediation
PEE → ATB → EI	0.7110	0.3697	0.000	Full mediation
PEE → SN → EI	0.4010	0.0375	0.008	Full mediation
PEE → PBC → EI	0.6850	0.1541	0.000	Full mediation

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

DISCUSSION AND CONCLUSION

The purpose of this study was to evaluate the effects of EE on students' EI at the Tshwane University of Technology. The findings of the PLS-SEM revealed that EE had a statistically significant relationship with PBC and EI. The results further uncovered that EE had no statistically significant relationship with ATB and SN. These findings suggest that EE does

not significantly influence students' SN and ATB, but has a positive effect on their EI and PBC. These results support those of previous research which discovered that EE is statistically significantly related to PBC and EI (Salisu, 2020; Ebewo et al., 2017; Rauch & Hulsink, 2015; Fayolle et al., 2006). The results contradict those of previous studies which reported that EE positively influences subjective norms and attitudes (Souitaris et al., 2007; Basu & Virick, 2008; Fayolle & Gailly, 2015; Akinbode et al., 2018; Otache et al., 2019; Lopez et al., 2021) and those that could not find a significant relationship between EE and EI (Mahmoud et al., 2020; Malebana & Zindiye, 2017; Ndofirepi & Rambe, 2017; Egerová et al., 2017). Findings also contradict studies that have found a negative relationship between EE and EI and its antecedents (Malebana, 2016b; Lima et al., 2015). These findings support Ajzen's (2011) assertion that the theory of planned behaviour can be used to evaluate interventions targeted at changing EI and its antecedents.

The results revealed that the PEE had a positive and statistically significant relationship with ATB, SN and PBC, but no significant direct effect on EI. This suggests that ATB, SN and PBC are more likely to be enhanced when students have positive perceptions about their learning from EE. Hence, the relationship between the PEE and EI was fully mediated by ATB, SN and PBC. The results of this study support those of Lopez et al. (2021) who stated that PEE had a statistically significant relationship with all the antecedents of EI, but contradicted the findings of Rengiah (2013), who observed that PEE had a direct and statistically significant relationship with EI.

Furthermore, the results have shown that entrepreneurial intentions of the respondents were predicted by ATB, SN and PBC, which provided full support of the TPB. ATB exerted the greatest influence on entrepreneurial intention, followed by PBC and SN. These findings concur with those of previous research (Mothibi & Malebana, 2019; Kautonen et al., 2015; Malebana, 2014; Mueller, 2011; Otuya et al., 2008; Basu & Virick, 2008). However, the findings are in contrast with earlier research which reported insignificant relationship between subjective norms, perceived behavioural control and entrepreneurial intention (Lopez et al., 2021; Mahmoud et al., 2020; Otache et al., 2019; Ndofirepi & Rambe, 2017; Linan & Chen, 2009; Wu & Wu, 2008).

IMPLICATIONS, LIMITATIONS AND FUTURE RESEARCH

The findings of the study have implications for entrepreneurship educators. EE should enhance both PBC and EI in order to improve entrepreneurial activity rates by enabling people to start new ventures. The findings indicate that EE had a significant and positive impact on students' PBC and EI. Since PBC and EI have been shown to directly influence entrepreneurial behaviour (Rauch & Hulsink, 2015; Kautonen et al., 2015), the results of this study suggest that with the right kind of support, students who have attended EE are more likely to start their own businesses. Therefore, entrepreneurship educators should in addition to teaching students relevant content while using student-centered methods, teach about the various support programmes which are available, and form partnerships with support organizations to facilitate access to these programmes. These efforts would help increase students' knowledge about available support programmes and how to access them, and ultimately improve students' PBC and EI. Experiential learning in which students are involved students in new venture creation projects among others could help strengthen PBC.

Since ATB had a greater effect on EI than other antecedents, which is similar to the findings of other studies in Mothibi & Malebana (2019), it is vital for entrepreneurship education

to increase the attractiveness of the entrepreneurial career option. That could be possible through actions such as supplementing teaching with the use of local entrepreneurs as guest speakers and case studies that portray the benefits of entrepreneurship.

The study is not without limitations. The sample of this study consisted of students pursuing an undergraduate entrepreneurship course at the Tshwane University of Technology and did not collect data from students pursuing other programmes. Future scholars should consider conducting a similar study in other South African universities that offer EE as a course in order to generalise the results of this study. The second factor which limited the findings of this study is the use of cross-sectional data. Researchers should consider longitudinal research to evaluate the effects of EE on students' EI in the South African context. Thirdly, just like the majority of previous studies, this study focused on the effects of entrepreneurship education on entrepreneurial intention but not on entrepreneurial behaviour, which could be an avenue for future research.

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