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ENTREPRENEURIAL INTENTIONS AMONG ENGINEERING STUDENTS: AN EMPIRICAL INVESTIGATION

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Abstract: The present study endeavours to measure factors influencing entrepreneurship intentions, which further leads to entrepreneurial behaviour amongst. A sample of 216 students pursuing engineering courses in different colleges in Chandigarh and its periphery was drawn. Using IBM SPSS AMOS v 26, confirmatory factor analysis was applied on identified measures of core entrepreneurial intentions model developed by Linen and Chen. It was found that 90 percent variation in entrepreneurial intentions was explained by subjective norms, personal attitude and perceived behavioural control. Personal attitude was found to be the strongest construct influencing intentions and subjective norms were negatively related to entrepreneurial intentions.

Keywords: Entrepreneurial intentions, perceived behavioural control, subjective norms, personal attitude.

INTRODUCTION

Entrepreneurship is an engine to economic development (Fayolle and Linan, 2013; Karimi et al., 2013), economic growth (Koe, 2012), social development (Valliere, 2015), personal development (Fauziah et al., 2010), national prosperity (Holmgren and From 2005), job creation (Ambad and Damita, 2016), international societal development (Abu-Saifan, 2012) and is required to spur innovation and productivity (Ozaralli and Rivenburgh, 2016). Entrepreneurship is significant for the sustainable growth and development (Law and Breznik, 2017) via taxes, ideas, and innovations (Potishuk and Kratzer, 2017). It is considered as a remedy for unemployment (Iqbal et al., 2012) as it a machinery for job creation (Habeeb and Ahmad, 2018) and social wealth (Langowitz and Minniti 2007). It helps the economy to sustain its competitiveness (Nazri et al., 2016; Shamsudin et al., 2017) in ever increasing challenges of globalisation. Entrepreneurship is synonymous to self-employment (Koe, et al., 2012; Schwarz et al., 2009). In developing countries like India, it is significant to promote entrepreneurship to resolve issues related to unemployment, sustainability, growth etc. Government of India has been taking up numerous initiatives to promote entrepreneurship including schemes like Pradhan Mantri Mudra yojana, Atal incubation centres, Atal tinkering labs, sector specific financing and promotion schemes, startup India, etc. just to name a few. This promotion of entrepreneurship is important for everyone, particularly, amongst students. Studentsshould be encouraged to take up entrepreneurship as career choice (Arora and Jain, 2019). Entrepreneurship behaviour is a result of Entrepreneurial intentions.

Studies like Krueger et al. (2000), Molaei et al. (2014) have supported the fact that entrepreneurial intentions are the strongest predictors of entrepreneurial behaviour. Intentional behaviour helps in understanding the reasons behind taking up entrepreneurship before these entrepreneurs actually look for opportunities (Krueger et al.,2000; Wang et al., 2016). Entrepreneurial intentions leads to own a business or formation of new business (Keat et al., 2011; Pillis and Reardon, 2007) or in other words becoming self-employed (Fosner and Jeraj, 2018; Koe, et al., 2012). Entrepreneurial intentions which is a foremost construct in literature, basically, is a state of mind that directs attention (Fayolle and

Gailly, 2015), activities of individual and experience (Do and Dadvari, 2017) towards entrepreneurship. Entrepreneurial intention is a commitment (Krueger, 1993), mental orientation (Peng, 2012) and a decision (Wilson et al., 2007) to start a business. According to Thompson (2009) entrepreneurial intentions are also defined as self-acknowledged conviction by a person that he intends to set a new business venture and consciously plan to do so at the same point of time. Considering the importance of entrepreneurship in developing countries, it becomes imperative to explore the factors driving entrepreneurial intentions (Arora and Jain, 2019) particularly amongst youngsters (Ambad and Damita, 2016; Ozaralli and Rivenburgh, 2016). The goal of the present study is to determine what factors stimulate entrepreneurial intentions amongst young engineering students of the Chandigarh and its periphery.

THEORY OF PLANNED BEHAVIOUR

The most popular theory adopted across globe to understand the antecedents of behavioural intentions is Ajzen's Theory of Planned Behaviour (TPB) (Ip et al., 2017; Torres et al., 2017; Koe, et al., 2012; Kautonen et al., 2010; Sommer and Haug, 2011). According to this theory there are three factors influencing intentions, namely attitude towards behaviour, subjective norms and perceived behaviour control. Attitude towards behaviour refers to the degree to which a person has favourable or unfavourable appraisal of the behaviour in question. Subjective norms refer to perceived social pressure to perform or not to perform particular behaviour. Perceived behavioural control refers to perceived ease or difficulty to perform behaviour (Singh and Onahring, 2019). The rule of theory of planned behaviour says that "the more favorable the attitude and subjective norm with respect to a behavior, and the greater the perceived behavioral control, the stronger should be an individual's intention to perform the behavior under consideration (Potishuk and Kratzer, 2017)."

REVIEW OF LITERATURE

Many studies have been conducted to measure entrepreneurial intentions in India and abroad.

Herman (2019) identified determinants of entrepreneurial intentions of 138 Romanian Engineering students and found that student's entrepreneurial personality, family background influence intentions positively. Further entrepreneurial education has no impact on intentions. Fosner and Jeraj (2018) studied entrepreneurial intentions among 1031 Slovenian students and found that two-third of respondents intended to start their own business immediately after completion of their studies. Sanchez and Sahuquillo (2018) established positive contribution of entrepreneurship education on entrepreneurial intent of 423 Spanish engineering university students. Further, the need for independence was found to be the key factor influencing intent. Do and Dadvari (2017) found significant positive relationship between entrepreneurial attitude orientation and entrepreneurial intentions of 295 Taiwan college students. Law and Breznik (2017) studied sample of 998 Hongkong university students and found innovation as the motivating factors amongst male students and attitude as motivating factor amongst female students leading to entrepreneurial intentions. Innovativeness of engineering students was significantly correlated to self-efficacy and attitude. Potishuk and Kratzer (2017) examined 84 summer school students from European institute and found that education environment affect entrepreneurial attitude and intentions. Topics related to opinion leaders positively influence pro-entrepreneurial attitude. It was concluded that the entrepreneurial attitude, subjective norms, behaviour control propel entrepreneurial intentions. Shamsudin et al. (2017) examined factors influencing entrepreneurial intention of Malaysian University students. Relationship between innovativeness, risk taking propensity, family background and supportive environment was found to be significantly positive. Relationship between entrepreneurial barriers and students' intentions was found to be significantly negative. Further, there was no significant support on the moderation of entrepreneurial programme and innovativeness, risk taking propensity, family background and barrier with entrepreneurial intention. Entrepreneurial education does moderate the relationship between supportive environment and entrepreneurial intention.So et al. (2017) explored entrepreneurial orientation amongst 381 Indonesian business students and found risk-taking, innovativeness and proactiveness as three dimensions of entrepreneurial orientation. Further a positive relationship was found between entrepreneurial orientation and entrepreneurial intention.Torres et al. (2017) found no gender difference in entrepreneurial intentions of 1493 undergraduate

Latin American students using Ajzen's TPB. Ambad and Damita (2016) studied 351 undergraduate Malaysia University students and identified personal attitude, perceived behavioural control and perceived relational support as determinants of entrepreneurial intentions u sing theory of planned behaviour. Ozaralli and Rivenburgh (2016) found positive attitude but low intentions towards entrepreneurship amongst 589 US and Turkish students. Experiential activities were found to contribute to perceived innovativeness. It was concluded that both US and Turkish respondents need trainings to start new ventures.

Particularly, in India, Arora and Jain (2019) compared impact of gender differences in entrepreneurial intentions amongst 600 students from private and government management institutions. It was found that male students from private institutions were more inclined towards entrepreneurship as their career choice. Habeeb and Ahmad (2018) explored factors leading to entrepreneurial intentions of 120 students from JamiaMilliaIslamia University, India. Personal Attitude was found to be more important factor towards formation of entrepreneurial intentions.Review of existing literature shows that measuring entrepreneurial intentions has been the interest area of researchers since last three decades (Kurczeskaand Bialek , 2014). Many constructs have been framed and explored but its applicability in this part of country i.e.Chandigarh still remains. Thus, the present study attempts to fulfil this gap by measuring entrepreneurial intentions of engineering students of educational institutions of Chandigarh and its periphery.

DATA BASE AND RESEARCH METHODOLOGY

The present study uses measures of core entrepreneurial intention model elements as presented in Entrepreneurial Intention Questionnaire (EIQ) developed by Linan and Chen (2009) based on Ajzen's (1991) Theory of Planned Behaviour (TPB). These contructs are personal attitude (PA), subjective norms (SN), perceived behavioural control (PBC) and entrepreneurial intentions (EI). Data on demographic variables like age, gender and self-employment status of parents were also collected. Linan and Chen's EIQ has been widely used, validated and tested in number of research studies (Arora and Jain, 2019). The results of EIQ were found quiet satisfactory. The success of testing EIQ in diverse countries motivated the researchers to use the Linan and Chen's EIQ. The constructs include 2 items under Subjective Norms (SN), 6 items each in Perceived Behaviour Control (PBC) and Entrepreneurial Intentions (EI) and 5 items under Personal Attitude (PA). Data were collected from 216 students pursuing engineering courses from varies engineering colleges of Chandigarh and its periphery. Since the constructs were known so, structural equation techniques (Do and Dadvari, 2017; So et al., 2017) were used to analyse the results. IBM SPSS AMOS-SEM v 26 was used for making calculations. Following hypotheses were constructed:

H1: Subjective norms have a significant positive impact on entrepreneurial intentions.

H2: Personal attitude has significantly positive impact on entrepreneurial intentions.

H3: Perceived behavioural control have positive impact on entrepreneurial intentions.

RESULTS AND ANALYSIS

The data analysis is presented in two steps. Step-1 evaluates the validity, reliability of the model and Step-2 measures the structural equation model.

Step-1 : Reliability, Validity, Construct Reliability

Following table-1 shows the reliability of the data alongwith Factor loadings, Average Variance Extracts (AVE) and Construct Reliability. AVE and Construct reliability has been calculated, with the intention to assess the quality of the measurement model, using the excel sheet developed by Prof. Michaël Korchia, BEM Bordeaux Management School (www.watoowatoo.net/mk). The value of Cronbach's Alpha and Construct Reliability should be greater than 0.7. Here table shows that both the values for each construct is greater than its threshold limit, hence it can be said that the variables under study are reliable. AVE measures the convergent validity, which is established if the value of AVE for each construct exceeds 0.50. Table-1 shows the values greater than 0.50, hence convergent validity is also established.

Table-1-Reliability, Validity and Construct Reliability

Construct	Factor Loading	Cronbach's Alpha	Average Variance Extracts	Construct Reliability
PA1 PA2 PA3 PA4 PA5	0.788 0.898 0.882 0.883 0.908	.944	0.762	0.941
PBC1 PBC2 PBC3	0.68 0.828 0.883	.837	0.643	0.842
SA1 SA2	0.70 0.782	.706	0.551	0.710
EI1 EI2 EI3 EI4 EI5 EI6	0.861 0.911 0.915 0.943 0.897 0.903	.964	.820	.965
Overall		.964		

After establishing reliability and convergent validity, the next step of the model is to establish discriminant validity. In order to establish discriminant validity, Fornell and Larcker's (1981) opined that the square root of Average variance extracts should be greater than the correlation amongst latent constructs. Table-2 shows that square root of AVE exceeds squared correlation amongst latent construct. Hence, the discriminant validity is also established.

Table-2-Discriminant Validity

	EI	PA	PBC	SN
EI	**0.9055**			
PA	0.905	**0.8729**		
PBC	0.81	0.779	**0.8019**	
SN	0.594	0.773	0.738	**0.7423**

Note: The values in diagonal represents the AVE square root and other values represent squared correlation.

The sampling adequacy was also determined using KMO and Bartlett's Test. According to table-3, the value is .924 and statistically significant. Thus, the sampling adequacy is established.

Table-3-KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.924
Bartlett's Test of Sphericity	Approx. Chi-Square	4534.797
	Df	171
	Sig.	.000

Step-2: Model Fit

Table-4 shows that significant positive correlation between variables under study i.e. Personal Attitude and Perceived Behaviour Control (77.9%), Perceived Behaviour Control and Subjective Norms (73.8%), Entrepreneurial Intentions and Subjective Norms (59.4%), Personal Attitude and Subjective Norms (77.3%), Perceived Behaviour Control and Entrepreneurial Intentions (81%). The highest correlation was found in Personal Attitude and Entrepreneurial Intentions i.e. 90.5 percent.

Table-4-Correlation Analysis

Variable		Variable	Standardised Estimate	P
PA	<-->	PBC	0.779	***
PBC	<-->	SN	0.738	***
EI	<-->	SN	0.594	***
PA	<-->	SN	0.773	***
PBC	<-->	EI	0.810	***
PA	<-->	EI	0.905	***

P-*** means significant at .0001 level of confidence.

1st order CFA Model: Following figure-1 shows the 1st order CFA c model:

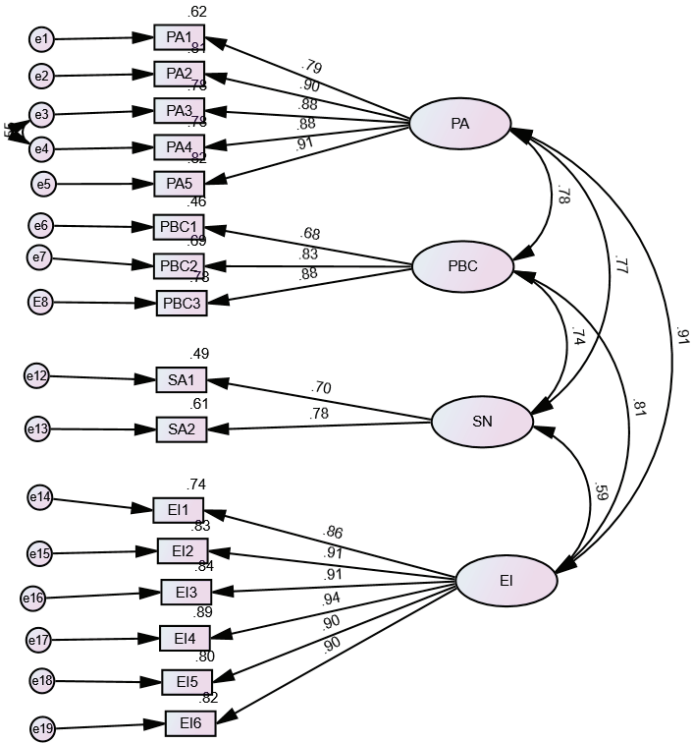

Figure-1: 1st order CFA model

2nd order CFA Model

The results of Chi-Square is 452.777 with Degrees of Freedom being 97. The value is significant at 99% level of significance. The value of CMIN/DF was 4.668 (below threshold limit of 5), GFI value was .801 and CFI was .901, IFI was .909. All these values were statistically significant at 99% level of confidence, thus, indicating the model fit.

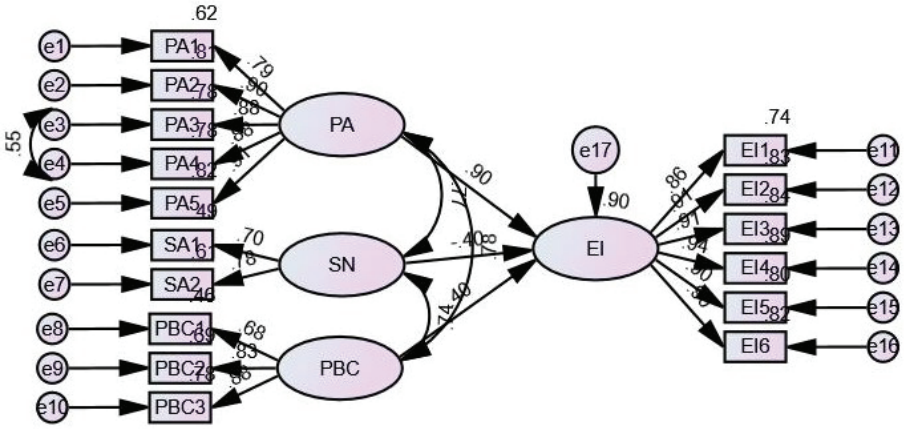

Figure-2: 2nd order CFA Model (Path Analysis)

Table-5-Path Analysis Results

Construct		Construct	Standardised Estimate	P	Hypothesis
EI	<---	PA	.899	***	H2 Accepted
EI	<---	PBC	.405	***	H3 Accepted
EI	<---	SN	-.400	***	H1 Rejected
R^2 Estimate			.904	***	
Variables:					
SA1		SN	0.49	***	
SA2		SN	0.611	***	
EI1		EI	0.741	***	
EI2		EI	0.829	***	
EI3		EI	0.837	***	
EI4		EI	0.889	***	
EI5		EI	0.804	***	
EI6		EI	0.816	***	
PBC1		PBC	0.463	***	
PBC2		PBC	0.686	***	
PBC3		PBC	0.78	***	
PA1		PA	0.621	***	
PA2		PA	0.807	***	
PA3		PA	0.778	***	
PA4		PA	0.779	***	
PA5		PA	0.825	***	

P-*** means significant at .0001 level of confidence.

Table-5 shows the regression results based on 2nd order Model. The result of Path Analysis shows that 90.4% (R2 estimation) variation in Entrepreneurial intentions is explained by all the variables under consideration. Personal Attitude explains significantly positive 89.9% variations in entrepreneurial intentions. Positive and significant 40.5% variation is explained by Perceived Behaviour Control. Subjective Norms explains significantly negative 40% variation in entrepreneurial intentions.

DISCUSSIONS

The Regression results shows that approval of decision to create a firm by friends influence Subjective Norms more as compared to approval of close family members. Approval of decisions by friends explains positive 61.1% variation and approval of decision by close family members explain variation in subjective norms by 49 percent. A significant negative relationship between Subjective norms and entrepreneurial intentions is established here. Subject norms influence entrepreneurship by -40 percent.Studies like Potishuk and Kratzer (2017)found positive relationship between subjective norms and entrepreneurship and Habeeb and Ahmad (2018) found weak but significant explanation by subjective norms. The results of present study contradicts both these studies. Here H1 i.e. Subjective norms have a significant positive impact on entrepreneurial intentions is rejected.

Perception about being an entrepreneur

is advantageous (62%), attractiveness towards entrepreurship as career option (80.7%), availability of opportunity and resources to run an enterprise (77.8%) and greater satisfaction by being an entrepreneur (77.9%) has significant and positive impact on personal attitude. Choice to become an entrepreneur among other alternatives (82.5%) appears to be most important factor influencing personal attitude. Personal attitude further influences entrepreneurial intentions. It explains significant and high positive 89.9% variation in entrepreneurial intentions. Literature shows that studies like Herman (2019), Habeeb and Ahmad (2018), Do and Dadvari (2017), Law and Breznik (2017), Potishuk and Kratza (2017), Shah and Soomro (2017), Tiwari, Bhat&Tikoria (2017) and Ambad and Damiter (2016) have established positive relationship between Personal Attitude and Entrepreneurial Intentions. The results of the present study support the existing studies. Further supporting Habeeb and Ahmad (2018) here it is concluded that Personal Attitude is the strongest construct to influence entrepreneurial intentions. Hypothesis H2 i.e. Personal attitude has significantly positive impact on entrepreneurial intentions is accepted.

Easiness to start a firm and keep it working (46.3%) and preparedness to start a venture(68.6%) has significant and positive influence on Perceived Behavioural Control. The most important factor influencing Perceived Behavioural Control is control over the creation process of a new venture as it explain 78% variation. Further, Perceived Behaviour Control and Entrepreneurial Intentions are also found to be significantly positively correlated. Thus the study support the findings of Potishuk and Kratza (2017), Tiwari, Bhat, &Tikoria (2017) and Ambad and Damita (2016) and contradict Shah and Soomro (2017) who established non-significant relationship between PBC and Entrepreneurial intentions. Here hypothesis H3 i.e. perceived behavioural control have positive impact on entrepreneurial intentions.

Readiness to do anything to become an entrepreneur (74.1%), having a professional goal to become an entrepreneur (82.9%), making every effort to start a firm (83.7%), giving a serious thought to be an entrepreneur (80.4%) and intentions to start a firm (81.6%) explain significant and positive variations in entrepreneurial intentions. Determination to create a firm in future is the most important factor influencing entrepreneurial intentions as it explain 88.9% variation. Overall, it can be concluded that entrepreneurial intentions are explained significantly positively by perceived behavioural control and personal attitude and significantly negatively by subjective norms.

PRACTICAL IMPLICATIONS OF THE STUDY

Entrepreneurship is the need of an hour as it leads to sustainable economic and social growth and development. The study is utmost important for policy makers, government, educational institutions and other stakeholders. It helps in understanding factors that influence entrepreneurial behaviour. Entrepreneurship behaviour is the result of entrepreneurial intentions. In case of engineering students entrepreneurial intentions are positively influenced by perceived behavioural control and negatively by subjective norms. Personal attitude is the strongest factor that influences entrepreneurship intentions. Students are attracted towards entrepreneurship and understand the advantages of being an entrepreneur. Thus, when attractiveness towards entrepreneurship and attitude is already present, policy makers and educational institutions should take up initiatives to encourage students to opt for entrepreneurship.This can be done by providing them with more opportunities and resources to run the ventures. It is also recommended that entrepreneurship education programme should be introduced that can create awareness, boost attractiveness further, help in identification of entrepreneurial opportunity, give a fair understanding of management of resources so that entrepreneurialmindset can be built.

LIMITATIONS OF THE STUDY

The present study is limited in terms of its sample size and choice of variables. Sample size is small and confined to Chandigarh and Periphery. Impact of demographic variables including age, gender, geography, family background on entrepreneurial intentions could also be explored. Literature also discusses influence of entrepreneurial education on entrepreneurial intentions, but this has not been considered as the part of this study. Present study focuses only on the basic constructs as per the Theory of Planned Behaviour including Personal Attitude, Perceived Behavioural Control, Subjective Norms and Entrepreneurial intentions.

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