Antecedents of entrepreneurial intention with specific reference to cyber entrepreneurship in Delhi/NCR

Supreet Wahee

KPMG Global Services,
Gurugram, India
Email: supreewahee@gmail.com

Léo-Paul Dana

Dalhousie University,
Canada
Email: lp762359@dal.ca
and
Sorbonne Business School,
France

Navneet Gera*

Jagannath International Management School,
Kalkaji, New Delhi, India
Email: gerasir@yahoo.com
*Corresponding author

Walter Vesperi

University of Messina,
Piazza pughiatti, n. 1, Messina, Italy
Email: wvesperi@unime.it

Abstract: The study aims to examine key drivers of entrepreneurial intention, with specific reference to cyber entrepreneurship. Understanding the key drivers and intention of cyber entrepreneurs has become a central issue in academic and public policy debate. Research is descriptive and causal in nature. A total of 817 students in the final year of management studies program, from management institutes in Delhi/NCR, were surveyed through a self-designed questionnaire. We have employed SPSS and AMOS to analyse the data using exploratory factor analysis and confirmed factor analysis. results of this research signify that all the independent variables such as attitude to entrepreneurship (ATE), entrepreneurship education (EE), perceived structural support (PSS), role of IT (RIT), cyber entrepreneurship intention, cyber entrepreneurial motivation factors and personality traits (PT), emerged as key factors of cyber entrepreneurship. This study offers theoretical exploration and practical research on the determinants of students' cybernetic entrepreneurship intention.

Keywords: entrepreneurship intention; innovative startup; cyber entrepreneurship; theory of planned behaviour; TPB.

Reference to this paper should be made as follows: Wahee, S., Dana, L-P., Gera, N. and Vesperi, W. (2022) 'Antecedents of entrepreneurial intention with specific reference to cyber entrepreneurship in Delhi/NCR', *Int. J. Entrepreneurship and Innovation Management*, Vol. 26, Nos. 1/2, pp.110–131.

Biographical notes: Supreet Wahee is working as an Assistant Manager (Learning and Development) with KPMG Global Services, Gurugram. Her specialisation area is entrepreneurship. She has served eight years as an Assistant Professor at the Bharati Vidyapeeth Institute of Management and Research, New Delhi. In renowned journals, she has more than ten publications, including indexed journals from Scopus.

Léo-Paul Dana is a Professor at Dalhousie University. He is also member of the Entrepreneurship and Innovation Chair, which is part of LabEx Entreprendre at the Université de Montpellier. He is graduate of McGill University and HEC-Montreal, he has served as Marie Curie Fellow at Princeton University and Visiting Professor at INSEAD. He has published extensively in a variety of journals including *Entrepreneurship: Theory and Practice*, *International Business Review*, *International Small Business Journal*, *Journal of Business Research*, *Journal of Small Business Management*, *Journal of World Business*, *Small Business Economics*, and *Technological Forecasting and Social Change*.

Navneet Gera is a Professor at Jagannath International Management School, KALKAJI New Delhi. His research areas are international business, marketing, and entrepreneurship development. He is a member of Academy of International Business (AIB) and member of Indian Commerce Association (ICA). He has published more than 35 papers in refereed journals and includes papers in Emerald and Scopus indexed journals.

Walter Vesperi has a PhD in Economics, Management and Statistics at the University of Catanzaro. He is Adjunct Professor in 'organisation theory'. His main research field are knowledge transfer, entrepreneurship, HRM and organisation theory. He is a member of Italian Association of Organization Studies (ASSIOA) and member of regional board of Italian Association of People Management – (AIDP).

1 Introduction

Entrepreneurship has assumed the role of a significant socio-economic driver in recent decades. The culture of start-ups is on the rise in India, attracting youth towards technology related businesses. Cyber entrepreneurship is becoming a new source for growth of the economy and its development. Many young entrepreneurs are starting online businesses such as Flipkart, Myntra, Snapdeal, Mydala, Bakebox and many more. Acceptance of the concept and the eagerness to become an internet-based self-entrepreneur is termed as cyber entrepreneurship. There is a drastic change in the business system and the way goods and services are provided through the internet and related information technology. For this reason, study on cyber entrepreneurship becomes relevant and is hence undertaken.

Turban et al. (2008), advocated that ample opportunities are available in the digital era to establish business through e-commerce models. Literature on entrepreneurship is available for intention to set up new business (Krueger et al., 2000; Kolvereid and

Isaksen, 2006; Kautonen et al., 2015). But no studies were conducted in the Indian context for cyber entrepreneurship. Also, we do not find studies on cyber entrepreneurship in other economies except for one in Malaysia wherein a few constructs have been used, thus narrowing down the meaning of entrepreneurship intention. Other studies have included the role of digital technologies as a factor for entrepreneurship intention, but not for cyber entrepreneurs. Some of the studies have included the role of information technology (RIT) within the entrepreneurship education factor. Therefore, having understood that little is known about entrepreneurial intention, particularly the cyber entrepreneurs, the study is apt to find out its antecedents in the Indian market.

A new version of entrepreneurship has been promoted by information technology that is the cyber-entrepreneurship. It has emerged due to the innovative practices being adopted by entrepreneurs around the world (Lian and Yen, 2017). It is becoming the new source for the growth of the economy and its development and is the extension of entrepreneurship in which cyber is a latest approach of conducting business. Cyber entrepreneurship or cyber entrepreneur is any startup venture or any effort that uses information technology for business activities and aims to earn profit in return. The cyber entrepreneurship uses information technology as a base and solely internet as a base Hasbolah et al. (2020). So, in simple terms it is a practice of starting a new venture in response of an explored opportunity, but using internet as a platform (Badaruddin et al., 2012).

The study is an extended version of theory of planned behaviour (TPB) proposed by Ajzen (1991). Hence, the study is novel due to two reasons: first, there are no studies which do focus exclusively on cyber entrepreneurs. Second, the study has combined constructs such as attitude, entrepreneurship education, personality traits (PT), motivation, RIT, perceived structural support (PSS), along with the dependent variable, i.e., entrepreneurship intention. Mustafa et al. (2016) say that such studies would be important because access to capital and institutional support is restricted in developing countries. Hence this model will help us articulate an entrepreneurship model for cyber entrepreneurs in the Indian context, where there are less resources. This will be the starting point to figure out the determinants of cyber entrepreneurs in India. The study will contribute significantly to the body of knowledge. Studying the determinants of cyber entrepreneurship will provide us insights about key determinants and also provide opportunities to create jobs for self and others.

Due to the lower operating cost as compared to traditional startups model's cyber entrepreneurship is gaining more attention and acceptability from young entrepreneurs. (Badaruddin et al., 2011; Wang et al., 2016). There is limited research done which are promoting the term cyber entrepreneurs. Literature related to cyber-entrepreneurship is comparatively new in the world of academics. This area of research is still at its nascent phase and very recently it has started to capture the attention of the researchers' globally and has opened a new research gap to be fulfilled by researchers (Badaruddin et al., 2015).

Therefore, the study has been undertaken to explore the drivers of entrepreneurial intention, particularly in India with reference to cyber entrepreneurship. On the other hand, students undergoing graduate and post-graduate programs in universities are familiarised with entrepreneurship programs and the role of universities to motivate students to undertake entrepreneurial activity is enlarged. Hence, how education for entrepreneurship is imparted in B-schools is drawing a lot of attention and transformation. Past research suggests that university graduate students have much

potential to increase entrepreneurship initiatives (Kolbre et al., 2005). Therefore, a deeper understanding of students 'activities for adopting cyber entrepreneurship is needed. This research offers several significant theoretical and practical implications for promoting cyber entrepreneurship.

This paper consists of six main sections. The first section opens to a discussion on the cyber entrepreneurship. Section 2 provides literature review on cyber entrepreneurship drivers. Section 3 explains methodology. Section 4 discusses the results followed by discussions and conclusion in Section 5. Finally, limitations and future scope are presented in Section 6.

2 Literature review

The study has taken as basis the well accepted TPB by Ajzen (1991). TPB states the role of three important constructs namely, personal attraction, perceived social norms and perceived behavioural control. Ajzen's Model (1991) that is, the TPB, is very well supported by Liñán (2004) and thus helps in comprehending the effect of social and skills perception towards entrepreneurial intention. Although literature failed to support with any constructive inputs on intention to set up business by youth, particularly in the IT sector, this study is the first attempt to explore the factors for cyber entrepreneurship.

2.1 Entrepreneurial education (EE)

Innovation and creativity could not be promoted due to lack of education system for entrepreneurship in India (Dana, 2001). Recently, Kuratko (2003) suggested that business professionals can teach key elements of entrepreneurship during ongoing entrepreneurship programs. Franke and Lüthje (2004) believe that instructional system of Universities must provide an academic atmosphere that can serve as a catalyst for high-tech start-ups. Alvarez et al. (2006) pointed out that business and technical skills are acquired by students through the environment provided by the University to set-up a new venture. Miller et al. (2018) has pointed out that entrepreneurship ecosystem is influenced through Universities.

Chang et al. (2019) explored the understanding of cyber-entrepreneurial self-efficacy (CESE) and its role in higher entrepreneurship education among students. In the sense of entrepreneurship education, the research investigated the results of the relationship between CESE, positive thinking, and cyber-entrepreneurial intentions (CEIs).

Dana (2000) has further pointed out that as an emerging economy, India can manage to innovate as well as transform the mindset of people through youth. Research studies have been carried out in India, mostly using case studies or approach to storytelling. Therefore, this study becomes crucial in the Indian context to identify the effect of entrepreneurship education and its effect on entrepreneurial outcomes for graduate and post-graduate students. Galloway and Brown (2002) stressed on technological knowledge to be integrated with customer need and market knowledge, for getting state-of-art products. Wee (2004) proposed that student-entrepreneurs need mentoring and experiential learning, and lecture-based education must be transformed into an authentic learning mode.

There are very few studies related to Indian context and as per the study done by Wu and Wu (2017), entrepreneurship education in Asia Pacific is not only limited but also lacks the key area of inquiry.

2.2 Attitude towards entrepreneurship

In previous research on factors influencing entrepreneurship intention, attitude towards entrepreneurship (ATE) emerged as an important factor, Here, entrepreneurship refers to personal interest in becoming an entrepreneur (Lüthje and Franke, 2003; Schwarz et al., 2009; Ariff et al., 2010). This refers to the degree to which a person has favourable appraisal of entrepreneurship. Detailed study with reference to the attitude of young people has been carried out by Iakovleva et al. (2011), both in developing as well as developed countries.

Attitude, as stated by Swan et al. (2007), plays a key role in influencing entrepreneurial intent. The more optimistic the view of an individual's outcome of starting a business (Shapero and Sokol, 1982; Krueger et al., 2000; Segal et al., 2005; van Gelderen and Jansen, 2006; Pruett et al., 2009), the more favourable their attitude toward their actions would be and as a result, the greater the individual's intention to step ahead and start a business.

2.3 RIT

Innovative entrepreneurial firms have the backbone of use of internet-based technologies through the process of diffusion and adoption, which is referred to as 'internetisation', Etemad et al. (2010). There are evidences to indicate that new venture creation is the outcome of usage of digital technologies (Cirulli et al., 2016; Nambisan, 2017). In fact, this transforms the way we communicate in society. It allows an unlimited flow of information. RIT is imperative in the current age of digital revolution and this ability was the foundation of worldwide economic growth (Graham and Messner, 1998). Uncertainties could be very well managed using digital technologies, in addition to stimulating entrepreneurship (Rippa and Secundo, 2018; Tomy and Pardede, 2018). So, it is assumed that students, who have good basic IT knowledge and are aware of the benefits brought by IT, would be more inclined towards starting a cyber-entrepreneurial venture. Two factors in the technology context are technology readiness and technology integration. Technology readiness consists of technology infrastructure and IT human resources, and technology infrastructure refers to technologies that enable internet-related businesses; IT human resources refer to IT professionals who also have the knowledge and skills to implement applications related to the internet (Zhu et al., 2006). Petti and Zhang (2014) advocated that technological innovation is the outcome of technological entrepreneurship.

2.4 Entrepreneurship motivation

The set of forces that initiate behaviour, and determine the structure, path, strength, and time of this behaviour, are called motivation. Many individuals have used the strategy of changing their goals and motivations in the varying conditions. As per Nuttin et al. (1984), motivation normally is formed as per the environmental context of a person. As per Ashley-Cotleur et al. (2009), there are various factors that act as motivator for an

individual to start own venture. These factors are generalised as variables of demographics or outlook, principles, or emotional factors. Nabi et al. (2015), advocated that motivation initiates through a desire to achieve the goal. Ashley-Cotleur et al. (2009) state that external motivator for a budding entrepreneur is the financial benefit in the form of salary and incentives. Intrinsic motivation is to do with satisfaction of being own boss and not being dependent on others, taking the complete ownership of success or failure of the venture. As per Benzing et al. (2009), due to dissimilar income levels and opportunities for employment in different countries, factors for motivation also vary for each country. The present literature on motivation for entrepreneurship lacks large evidence that is cross-cultural (Verheul et al., 2006).

Wang et al. (2016) found that cyber entrepreneurial motives, both intrinsic and extrinsic, have a positive effect on cyber entrepreneurial intention. Motivation, however, is complex as the motivations of people continue to evolve with every step of life. Things that have begun for a certain reason may continue for other reasons. Role and influence of the goal has gained much importance in studies relating to entrepreneurial motivation (Locke and Latham, 2002). In the words of Ucbasaran et al. (2008), it can be argued that self-efficacy decides what one feels s/he can do whereas motivation decides what a person intends to do. With the changing environmental factors, an individual should be able to deal with and adapt to new conditions by altering her/his motives.

2.5 PT

Personality plays a crucial role in assessing individual's ability to become an entrepreneur. As per Gartner (1988), individuals with a certain specific set of PT can be termed entrepreneurs. Various aspects of entrepreneurship such as intention to start a venture, successful running of business and enhancement of corporate entrepreneurship, can be predicted from PT of an individual (Shaver and Scott, 1992). Many researchers have focused on personality factors from the perspective of entrepreneurship. Self-efficacy has been mentioned by Bandura and Walters (1997), which means one's beliefs about own abilities, and hence holds significant role in setting the personality trait.

Chang et al. (2018) found that several researches have indicated that young adults' entrepreneurial skill is predictable by their entrepreneurial personality characteristics, their parents' authoritarian parenting style, and the existence of entrepreneurial role models in their lives (Obschonka et al., 2011).

Entrepreneurship is associated with three types of PT. These are:

a willingness to take risks

b control location

c aspiration for independence-levels of entrepreneurial intentions vary depending on the individual's personality.

Entrepreneurs, whether students, non-students, young people or elderly, have the qualities required to complete effective entrepreneurial endeavours. These attributes may contrast, contingent upon the researcher's interest. Young people usually have a unique identity. They respect quality, self-regulation and autonomy issues, and consider it imperative to become an entrepreneur in their dreams for the future (Bhandari and Bordoloi, 2006). They see change as a chance to unleash their potential and to some extent, take risk

(Brockhaus, 1980). They have social skills as well as harmony between their instincts and ideas (Reimer-Hild et al., 2005).

Activity for entrepreneurship opportunities requires time to explore the available resources. The second activity towards entrepreneurship could be perceived from exploitation in routine work including teaching and regular work-load. In the words of Radosevich (1995), both these activities cannot be symbiotic with each other.

There have been numerous personality trait studies and it is difficult to compare the studies systematically. Therefore, universal personality measurement is needed as a factor (Singh and de Noble, 2003). It is usually seen that individuals with specific PT may be more attracted to activities of entrepreneurship and are inclined to opportunities of entrepreneurship. Entrepreneurship plays an important role in behaviour which, in turn, is driven through personality. Personality leads to building of the intellect as mentioned by Fuller et al. (2018), which finally leads to formation of affinity towards entrepreneurship.

2.6 PSS

In particular, entrepreneurship is good for humanity, leading to innovation, job formation and economic progress (e.g., Drucker, 1985; Kirchhoff and Phillips, 1988; Schumpeter, 1936). Regulatory environment is a factor that is very important within the environmental context, to affect innovation diffusion (Zhu et al., 2004). The significant development experienced during this era in terms of the extent of lessons given and content of associated curricula, can be seen as a symptom of extensive governmental faith in the beneficial effect that entrepreneurship can have on a nation's socio-economic and political infrastructure (Matlay and Carey, 2007). Governments can therefore encourage e-business operations through laws, and policies that support them.

Denanyoh et al. (2015) also in his research found a significant positive relationship between entrepreneurial intention and structural support which implies that when initiatives, incentives and other facilities are made available for students, they will develop intentions to start their own businesses.

An encouraging regulatory environment is essential for development of e-business. Government, industry and universities have been putting in efforts to set up incubator cells for establishing entrepreneurial culture in India. More efforts are required in order to survive in a competitive market and address the challenges of evolving startups in India.

2.7 Entrepreneurship intention

Basis of this study is the foundation model of Ajzen (1991), which has been tested many times and is generally used in most studies that is TPB. Krueger (1993) stated that entrepreneurship intention plays a key role in determining willingness to establish business venture. Crant (1996) describes entrepreneurial intention as one's decision on the probability of setting up and running own company. Subsequently, researchers stated that intention is an important determinant for planned behaviour (Bagozzi et al., 1989; Kolvereid, 1996; Liñán, 2004). Further studies have supported entrepreneurial intention to be an important variable for setting up of business (Kautonen et al., 2013). Additionally, the well accepted TPB by Ajzen (1991) states the role of three important constructs namely, personal attraction, perceived social norms and perceived behavioural control, to explain entrepreneurial intention. Moreover, the Ajzen's Model (1991) is very

well supported by Liñán (2004) and helps in comprehending the effect of social and skills perception towards entrepreneurial intention.

At the same time, new forms of entrepreneurship are emerging through technological evolution. Badaruddin et al. (2012) tried to look at the initial stages of cyber entrepreneurial inclination among students doing undergraduate courses in higher learning institutions in Malaysia. The primary objective of this paper was to inspect the extent of inclination of business students to start a cyber-entrepreneurial enterprise in Malaysia. Badaruddin et al. (2015) highlighted various dimensions and terms used in entrepreneurship, especially different aspects of cyber entrepreneurship. It was indeed documented by Fayolle and Liñán (2013) that entrepreneurship intention needs to be measured by a new scale. Hence, the current study has included additional variables in order to enable comprehensive measurement of entrepreneurship intention.

Looi and Khoo-Lattimore (2015) mention that academic interest is drawn with reference to university students towards entrepreneurship intention. Moreover, it is important not only to stimulate entrepreneurship, but also to determine the explanatory variables which may vary from country to country (Dana, 1997, 2001, 2014).

Cyber entrepreneurship needs more attention since little is known about this phenomenon for setting up of business (Carrier et al., 2004; Martin and Wright, 2005). Policymakers have shown interest in ascertaining the reasons for people to enter into cyber entrepreneurship; hence, this study strives to find out the factors that determine cyber entrepreneurship.

Literature review has identified some important variables that are needed to study cyber entrepreneurship determinants. The factors that emerged from our literature review are: ATE, EE, PSS, RIT, motivational factors, CE intention and PT.

3 Methodology

We base this research on exploratory and quantitative analysis to test the proposed research question. A survey questionnaire was used as a method for quantitative data collection in this study. The study concentrates on students of management undergoing MBA from B-Schools in Delhi NCR. The study population comprises postgraduate students. Postgraduates were chosen for the research because they were anticipated to have fundamental ICT understanding and literacy skills (Roesnita and Zainab, 2005). Moreover, as mentioned by Liñán and Chen (2009), it is a common practice to study through students' sample since the propensity to set-up business would be relatively more.

We took the sample size to be five times the number of items in the questionnaire, Malhotra (2010). The adopted research design is kept both descriptive and causal. Collection of data has been done using questionnaire as a measurement tool from established scales. The questionnaire given to students measured the following variables: attitude towards entrepreneurship, education in entrepreneurship, RIT, PSS, PT, motivation and CE intent. We adapted the scale of Liñán and Chen (2009), in addition to the self-designed construct of RIT and questions of demographics.

To measure the variables, items from existing literature were used. All measures were collected using a five-point Likert scale which is easily understandable by respondents (Brace, 2004). Each statement was put on a five-point Likert scale for respondents to respond to statements, ranging from 'strongly agree' to 'agree,' with 'neutral' as a middle

option followed by 'disagree' and 'strongly disagree'. The questionnaire contained seven factors dealing with CE determinants containing 34 statements, and 18 statements about CE motivation and CE intentions. Finally, we included 817 questionnaires which were correctly filled, out of total 850 collected survey questionnaires.

4 Results

Details of demographics are shown in Table 1.

Demographics (Table 1) show that data collection respondents were made up of 55.08% males compared to 44.92% females. Majority of respondents were under the age of 20 years and represent 56.3% of the data collected, 26.92% of respondents are in the age group of 21–25 years and 16.76% of respondents are over the age of 30 years. Most respondents are postgraduates (86%) and 14% are professionals.

Table 1 Demographic and socio-economic analysis of respondents

Group (n = 120)	*Variable*	*Percentage*
Gender	Male	55.08 %
	Female	44.92 %
Age	Less than 20	56.3%
	21–25	26.92%
	More than 30	16.76%
Edu_qualification	Post-graduate	85.68%
	Professionals	14.32%

Table 2 Reliability test

Factor	*Score*
Personality traits	0.914
Cyber entrepreneurial motivation	0.885
Entrepreneurship education	0.836
Role of information technology	0.839
Perceived structural support	0.837
Attitude towards entrepreneurship	0.779
Cyber entrepreneurial intention	0.690
All factors	0.888

Overall reliability

Cronbach's alpha value is 0.888 for cyber entrepreneurs as shown in Table 2. Cronbach alpha of more than 0.6 represents a reliable set of underlying construction measures, according to Burgess and Steenkamp (2006).

4.1 Factor analysis and KMO test

The sampling adequacy value of Kaiser-Meyer-Olkin MSA was discovered to be 0.896, suggesting that the sample was good enough for sampling. It was found that significance

of the sphericity test by Bartlett was appropriate, so the test results provided sufficient clarity to support appropriate use of CE scale items for exploratory factor analysis. Principle component analysis (PCA) was the main procedure used in the exploratory factor analysis process to investigate the basic structure of cyber entrepreneurship determinants. There are only seven factors for cyber entrepreneurship, each having an Eigen value of over 1. The values of Eigen were 9.137, 7.068, 2.140, 2.062, 1.694, 1.501, 1.266 and 1.114 respectively for the seven factors. Index for determining the total factor solution was drawn from percentage of the total variance explained, which is 59.20% for CE in our case. That implies that 51 items were narrowed down to seven factors and in this process, 41.80% of data was lost while ascertaining the factors for CE.

Table 3 KMO and Bartlett's test

Kaiser-Meyer-Olkin measure of sampling adequacy		*0.896*
Bartlett's test of sphericity	Approx. chi-square	18116.770
	Df	861
	Sig.	0.000

Source: our elaboration

Interpretation and factors

A name or label must be assigned to each factor when interpreting the factors to show that it is the interpretation of items taken together (Tabachnick and Fidell, 2007). Shown below is interpretation of every factor derived from the factor analysis performed using PCA. Factor titles designated to the items of cyber entrepreneurship are also discussed.

Table 4 Explanation of factors (alpha values, AVE, MSV and variance)

Items	*Factor loadings*	*Rotation sums of squared loadings*	*Cronbach's alpha*	*AVE*	*MSV*
Factor no 1: Personality traits		*12.508*	*0.914*	*0.574*	*0.36*
To be a cyber entrepreneur, I have mental maturity.	0.84				
I have leadership skills to be a cyber entrepreneur.	0.835				
Being a cyber entrepreneur, I have problems solving skills.	0.822				
I have communication skills to be a cyber entrepreneur.	0.818				
I believe risk-taking is a positive trait	0.752				
I have creativity needed to be an cyber entrepreneur	0.71				
I'm willing to take substantial risks for substantial returns	0.624				
I like trying new stuff. (exotic food, for example, or going to new places)	0.611				

Source: our elaboration

Table 4 Explanation of factors (alpha values, AVE, MSV and variance) (continued)

Items	*Factor loadings*	*Rotation sums of squared loadings*	*Cronbach's alpha*	*AVE*	*MSV*
Factor no 2: Cyber entrepreneurial motivation		*11.097*	*0.885*	*0.497*	*0.31*
I'm attracted to CE because it has good market potential.	0.765				
I'm motivated because I've been running my business for several years.	0.735				
My economic background helps me to start business online.	0.661				
I am attracted towards CE as it will enable me to achieve self-independence	0.643				
I am attracted towards CE as it does not require too much capital to start.	0.619				
I am attracted towards CE as it does not require too many employees to run it.	0.592				
I am driven to earn a large personal income	0.567				
I am attracted towards CE as I have personal Characteristics in line with this type of business	0.54				
I like to be innovative, be at the forefront of technology	0.502				
I am motivated to make personal life more flexible.	0.501				
Factor no 3: Entrepreneurship education		*9.968*	*0.836*	*0.577*	*0.38*
The course of entrepreneurship should be made mandatory to boost entrepreneurial spirit on campus.	0.716				
More on-campus entrepreneurial and company training programs would assist learners begin companies.	0.692				
My university offers the needed entrepreneurial expertise.	0.683				
Enterprise programs have helped me to improve my practical knowledge of business.	0.641				
My university has an infrastructure that works well to promote the start-up of fresh companies.	0.636				
My university develops my skills and abilities in entrepreneurship.	0.61				
I am well prepared for entrepreneurial careers by my university course.	0.576				
Entrepreneurship as a subject is very important	0.514				

Source: our elaboration

Table 4 Explanation of factors (alpha values, AVE, MSV and variance) (continued)

Items	*Factor loadings*	*Rotation sums of squared loadings*	*Cronbach's alpha*	*AVE*	*MSV*
Factor 4: Role of information technology		*9.046*	*0.839*	*0.550*	*0.37*
IT courses help you start your business online	0.783				
The ICT and entrepreneurship training program will help me start my online business.	0.731				
Courses in information communication technology (ICT) helped me develop my communication skills.	0.659				
I believe IT knowledge is an added advantage when it comes to taking a cyber business path.	0.627				
IT courses helped me acquire the capacity to plan my daily job and organise it.	0.578				
Factor 5: Perceived structural support		*6.379*	*0.837*	*0.584*	*0.25*
Indian economy offers cyber entrepreneurs with many possibilities.	0.759				
A structural system that includes private organisations encourages cyber entrepreneurs.	0.746				
Cyber entrepreneurs are encouraged by a structural system that includes NGOs	0.732				
It is quite hard for businessmen in India to take loans from banks.	0.719				
Factor 6: Attitude towards entrepreneurship		*5.883*	*0.779*	*0.504*	*0.44*
I would like to begin an online company if I had the chance and resources.	0.794				
I think I'm sure I'll be successful if I started my online business.	0.771				
A career as cyber entrepreneur is attractive for me.	0.746				
I would rather be my own boss than have a secure job.	0.585				
Factor 7: Cyber entrepreneurial intention		*4.327*	*0.690*	*0.512*	*0.40*
My professional goal is to become a cyber businessman.	0.722				
I'd rather be a cyber entrepreneur than a company employee.	0.643				

Source: our elaboration

4.2 Reliability and validity of scale

4.2.1 Reliability test

PT has the greatest alpha value of Cronbach (0.914), while cyber entrepreneurship motivation has the second largest alpha value (0.885), followed by entrepreneurship education (0.836), RIT (.839), PSS (0.837), ATE (0.779), cyber entrepreneurship intention (.690). All variables have good internal-consistency reliability because they score more than 0.7. Confirmatory factor analysis (CFA) was performed to provide a more thorough understanding of the motivation of cyber entrepreneurs. It was used to identify and determine connection of the variables within the CFA or measurement model.

4.2.2 Validity

The scale has been developed with an intention to measure what is actually meant to measure (Fisher, 2007). Adopted statements in the questionnaire have been obtained from established scales from literature review pertaining cyber entrepreneurship, and this proves validity. Moreover, data has been collected from different B-schools in Delhi NCR to justify diversification as well as to validate the study. CFA was used to determine the connection between latent and observed variables. Construct and discriminant validity have been validated as shown in Table 5.

1 Convergent reliability (CR) is greater than 0.7.

2 CR > average variance explained (AVE).

3 AVE > 0.5.

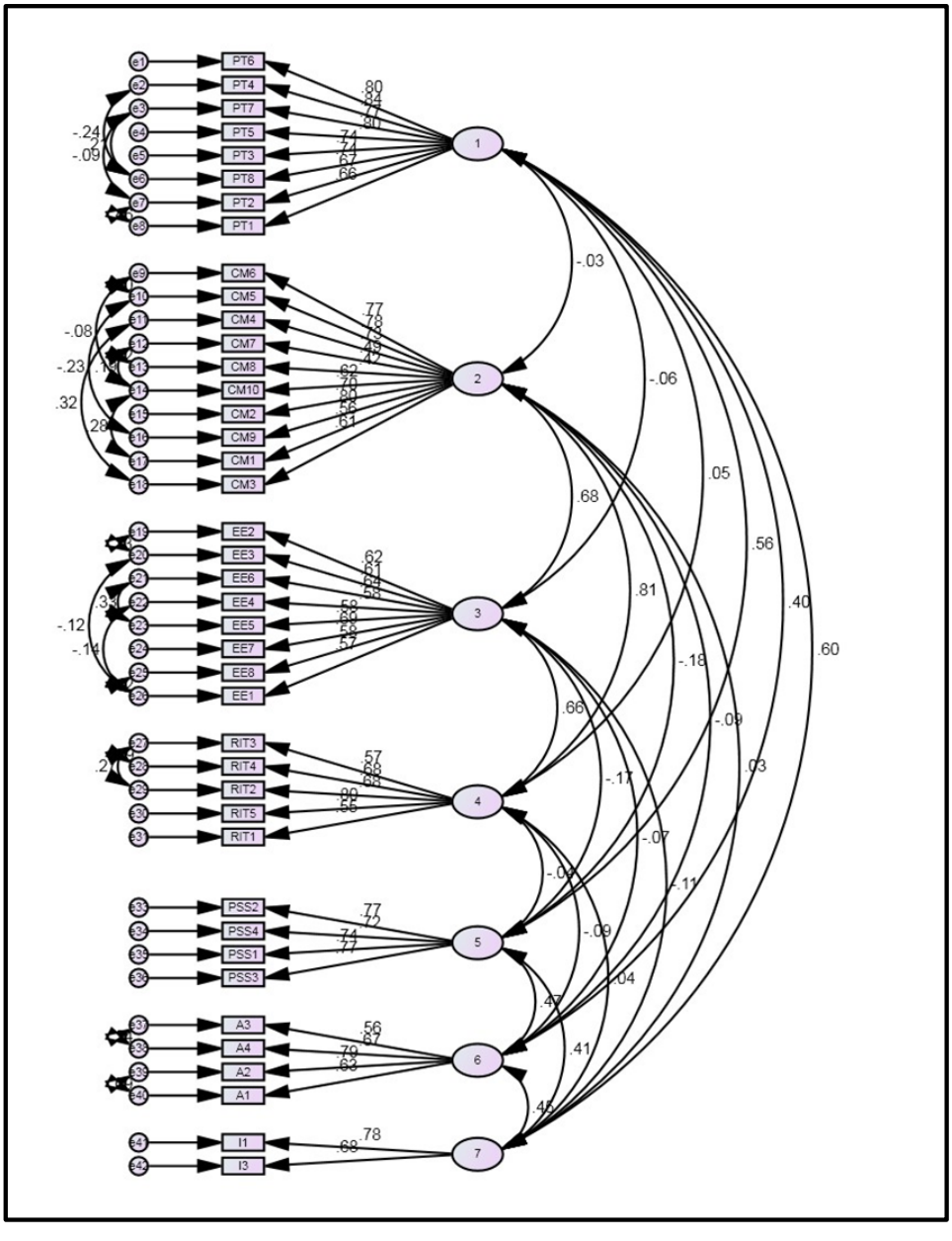
According to Fornell and Larcker (1981), discriminating validity shows the magnitude of distinction between the constructs. It can be evaluated by comparing square correlation (R2) of the paired constructs with each construct's AVEs. The values of AVE and MSV along with CR are mentioned in Table 1.

4.2.2 Validity of the measures used for the study: CFA

CFA was performed as shown in Figure 1 to determine construct validity of the scales described above.

AMOS is used to perform an analysis of CFA. All parcels of items loaded onto their respective factors significantly. The two variables were permitted to correlate despite being hypothesised as autonomous. However, the later correlation ($r = 0.05$) between the variables was non-significant, promoting the two scales 'autonomy. For overall model fit, the chi-square value was significant, $\chi 2\ (774) = 2795.610$, $p < 0.001$ suggesting a lack of fit between the hypothesised model and data. However, other fit indices have been evaluated due to sensitivity of $\chi 2$ in large samples (Kline, 1998). Examination of these indices showed that TLI = 0.870, CFI = 0.883, RMSEA = 0.057, which fit acceptable model.

Figure 1 First order confirmatory model (see online version for colours)



Source: our elaboration

Table 5 Results of goodness of fit indices

Indicators	*Results*	*Standard values*
GFI (goodness fit index)	0.863	Close to 0.90
TLI (Tuck Willis index)	0.870	Close to 0.90
NFI (normed fit index)	0.847	0.80 or higher
CFI (comparative fit index)	0.883	0.80 or higher
RMSEA (root mean square error of approximation)	0.057	0.08 or lower

Source: researchers' elaboration

The results of goodness of fit are as per standards mentioned in Table 5.

5 Discussion and conclusions

Entrepreneurship serves as an impetus for economic development. Identifying the determinants that affect individuals' cyber entrepreneurial intent has strong significance in specifying the level of their interest in beginning own venture. In the analysis, cyber entrepreneurial motivation and cyber entrepreneurial intentions emerged as important factors for cyber entrepreneurship. The findings suggest that the TPB is an important model for understanding the association between entrepreneurial motivation, entrepreneurial intention, and the determinants of entrepreneurial intention. The results are consistent with the study of Achchuthan and Nimalathasan (2013) in terms of the association between entrepreneurial motivation and entrepreneurial intention, and Solesvik (2013) who suggested that entrepreneurial motivation is significantly associated with attitude towards entrepreneurship, subjective norms, entrepreneurial intention, and perceived behavioural control.

Among all variables in these studies, personality trait towards entrepreneurship has proved to be the most significant factor affecting cyber entrepreneurship in India. Personality trait accounts for 12.50% of the intent and motivation of cyber entrepreneurship. Entrepreneurship education explains 11.09 %, RIT, PT and PSS explain 9.968, 9.046 and 6.37 respectively. Here the five factors capture 48.99% of variance of the variable. Therefore, in the context of Indian culture, personality trait, which is more of individualistic nature, plays a key role in setting up cyber entrepreneurial venture.

5.1 Managerial implications

There are several important implications for this research. Entrepreneurship education emerged as an important factor in cyber entrepreneurship from results of the analysis. Entrepreneurship education helps to turn thoughts into action by providing individuals with the knowledge they need to start a business venture and prepare them for future uncertainties (Izquierdo, 2008; Ahmed et al., 2010; Ekpoh and Edet, 2011; Hong et al., 2012).

The findings state that EE plays a main role in empowering students ' desire towards cyber entrepreneurship, and indicate that universities and higher learning institutions have an essential role in generating and researching budding entrepreneurs (Tam, 2009;

Izedonmi and Okafor, 2010; Gelard and Saleh, 2010; Ooi et al., 2011; Turker and Selcuk, 2009; Kolvereid and Moen, 1997).

Study findings show that Attitude towards entrepreneurship is an important factor for cyber entrepreneurship. This result is consistent with previous research of Badaruddin et al. (2011), van Gelderen et al. (2008) and Schwarz et al. (2009). PSS is another factor that has been confirmed to be important in this research. Therefore, PSS has been stated to be an important factor of cyber entrepreneurship. The findings are consistent with previous studies by Lüthje and Franke (2003) and Turker and Selcuk (2009). It suggests that, in melding the intention of an individual towards entrepreneurship in India, support from governments, banks and other agencies is very important. Adequate knowledge of IT plays an important role to perform cyber entrepreneurship proficiently.

This research also contributes to existing literature by identifying the determinants of cyber entrepreneurship and the role of CE motivation and CE Intent, thereby emphasising the importance of future research. With more entrepreneurship in India, on-the-job training of skills would be possible, and more jobs could be created in India. Future direction of research may be guided by these factors, and their influence on CE motivation and intention.

This study further adds to CE literature by recording the existence of an underlying set of factors that should be recognised in promoting cyber-business activities. The findings can be used to promote cyber entrepreneurship research. The validated model includes determinants of CE, CE motivation and CE intention.

5.2 Conclusions

The present study presents a summary of the literature on entrepreneurship intention, taking TPB as the foundation theory. Results of this research lay stress on the significance of various factors of cyber entrepreneurship not included in other studies. Therefore, major studies can be used to design further research into cyber entrepreneurship by focusing on other factors that have not been examined in this research. These results add to the field of cyber entrepreneurship. Future research can explore the association of these variables and the outcomes of cyber entrepreneurship.

Contributions from the present study include the determinants of cyber entrepreneurial motivation and intentions, which are entrepreneurship education, attitude towards entrepreneurship, PT, RIT, PSS, and the relationship between cyber entrepreneurship motivation education and cyber entrepreneurial intentions. Specifically, this research gives a clear understanding of the importance of CE motivation in the association between determinants of CE and entrepreneurial intentions. Findings of this study emphasise all independent variables such as entrepreneurship attitude, entrepreneurship education, PSS, RIT, and personality.

The study provides valuable insights that can assist policymakers and educational institutions in framing changes in the design of entrepreneurial programs and their operations. Government, industry and universities have been putting in efforts to set up incubator cells for establishing entrepreneurial culture in India. More efforts are required in order to survive in a competitive market and address the challenges of evolving startups in India.

6 Limitations and future scope of the study

This study is not without limitations. The main limitation of this study is that the population is restricted to students pursuing post-graduation in management in the Delhi/NCR region. Future research could be undertaken for students doing graduation in other disciplines such as engineering, hospitality, legal, architecture, accounting and medical studies. Future research may take into consideration cultural difference through research in different countries.

References

Achchuthan, S. and Nimalathasan, B., (2013) 'Relationship between entrepreneurial motivation and entrepreneurial intention: a case study of management undergraduates of the University of Jaffna, Sri Lanka', *ICBM 2012*, p.42.

Ahmed, I., Nawaz, M.M., Ahmad, Z., Shaukat, M.Z., Usman, A., Rehman, W.U. and Ahmed, N. (2010) ''Determinants of students' entrepreneurial career intentions: evidence from business graduates', *European Journal of Social Sciences*, Vol. 15, No. 2, pp.14–22.

Ajzen, I. (1991) 'The theory of planned behavior', *Organizational Behavior and Human Decision Processes*, Vol. 50, No. 2, pp.179–211.

Alvarez, R.D., DeNoble, A.F. and Jung, D. (2006) 'Educational curricula and self-efficacy: entrepreneurial orientation and new venture intentions among university students in Mexico', *International Research in the Business Disciplines*, Vol. 5, No. 6, pp.379–403, https://doi.org/10.1016/S1074-7877(06)05019-7.

Ariff, A.H.M., Bidin, Z., Sharif, Z. and Ahmad, A. (2010) 'Predicting entrepreneurship intention among Malay university accounting students in Malaysia', *UNITAR E Journal*, Vol. 6, No. 1, pp.1–10.

Ashley-Cotleur, C., King, S. and Solomon, G. (2009) *Parental and Gender Influences on Entrepreneurial Intentions, Motivations and Attitudes* [online] http://usasbe.org/knowledge/proceedings/proceedings Docs/USASBE 2003 proceedings-12 pdf (accessed 10 March 2009).

Badaruddin, M.N.B.A., Arokiasamy, L. and Yusoff, H. (2011) 'Cyber entrepreneurship in institutions of higher learning in Malaysia', *International Journal of Academic Research*, Vol. 3, No. 4, pp.73–110.

Badaruddin, M.N.B.A., Arokiasamy, L., Nordin, N.M., Yusof, H. and Zakaria, T. (2012) 'Cyber-entrepreneurial intention among business undergraduates in institutions' of higher learning in Malaysia', in *Proceeding of 2nd International Conference on Management*, Arokiasamy School of Business and Management.

Badaruddin, M.N.B.A., Moorthy, M.K., Mohamad, Z.Z.B. and Zin, A.W.B.M.(2015) 'Cyber entrepreneurship: a new revolution', *International Journal of Physical and Social Sciences*, Vol. 5, No. 8, pp.127–137.

Bagozzi, R., Baumgartner, H. and Yi, Y. (1989) 'An investigation into the role of intentions as mediators of the attitude-behavior relationship', *Journal of Economic Psychology*, Vol. 10, No. 1, pp.35–62.

Bandura, A. and Walters, R.H. (1977) *Social Learning Theory*, Vol. 1, Prentice-hall, Englewood Cliffs, NJ.

Benzing, C., Chu, H.M. and Kara, O. (2009) 'Entrepreneurs in Turkey: a factor analysis of motivations, success factors and problems', *Journal of Small Business Management*, Vol. 47, No. 1, pp.58–91.

Bhandari, L. and Bordoloi, M. (2006) 'Income differentials and returns to education', *Economic and Political Weekly*, pp.3893–3900.

Brace, I. (2004) *Questionnaire Design. How to Plan, Structure and Write Survey Material for Effective Market Research*, Kogan Page, London.

Brockhaus, R.H. (1980) 'Risk-taking propensity of entrepreneurs', *Academy of Management Journal*, Vol. 23, No. 3, pp.509–520.

Burgess, S.M. and Steenkamp, J.B.E.M. (2006) 'Marketing renaissance: how research in emerging markets advances marketing science and practice', *International Journal of Research in Marketing*, Vol. 23, No. 4, pp.337–356.

Carrier, C., Raymond, L. and Eltaief, A. (2004) 'Cyber entrepreneurship: a multiple case study', *International Journal of Entrepreneurial Behavior& Research*, Vol. 10, No. 5, pp.349–363.

Chang, S-H., Shu, Y., Wang, C-L., Chen, M-Y. and Ho, W-S. (2020) Cyber-entrepreneurship as an innovative orientation: Does positive thinking moderate the relationship between cyber-entrepreneurial self-efficacy and cyber-entrepreneurial intentions in non-IT students?', *Computers in Human Behavior*, Vol. 107, No. 2020, p.105975, ISSN: 0747-5632, DOI: https://doi.org/10.1016/j.chb.2019.03.039.

Chang, S-H., Wang, C-L., Lee, J-C. and Yu, L-C. (2018) 'Who needs entrepreneurial role models? Driving forces of students' cyber-entrepreneurial career intention', *Eurasia Journal of Mathematics, Science and Technology Education*, Vol. 14, No. 7, pp.3083–3098, https://doi.org/10.29333/ejmste/91625.

Cirulli, F., Elia, G., Lorenzo, G., Margherita, A. and Solazzo, G. (2016) 'The use of MOOCs to support personalized learning: an application in the technology entrepreneurship field', *Knowledge Management & E-Learning: An International Journal*, Vol. 8, pp.109–123.

Crant, J.M. (1996) 'The proactive personality scale as a predictor of entrepreneurial intentions', *Journal of Small Business Management*, Vol. 34, No. 3, pp.42–49.

Dana, L.P. (1997) 'The origins of self-employment in ethno-cultural communities: distinguishing between orthodox entrepreneurship and reactionary enterprise', *Canadian Journal of Administrative Sciences*, Vol. 14, No. 1, pp.52–68.

Dana, L.P. (2000) 'Creating entrepreneurs in India', *Journal of Small Business Management*, Vol. 38, No. 1, pp.86–912.

Dana, L.P. (2001) 'The education and training of entrepreneurs in Asia', *Education + Training*, Vol. 43, Nos. 8-9, pp.405–416.

Dana, L.P. (2014) *Asian Models of Entrepreneurship – From the Indian Union and Nepal to the Japanese Archipelago*: *Context, Policy and Practice*, 2nd ed., World Scientific, Singapore.

Denanyoh, R., Adjei, K. and Nyemekye, G.E. (2015) 'Factors that impact on entrepreneurial intention of tertiary students in Ghana', *International Journal of Business and Social Research*, Vol. 5, No. 3, pp.19–29.

Drucker, P.F. (1985) *Innovation and Entrepreneurship – Practice and Principles*, Elsevier Butterworth-Heinemann, Oxford.

Ekpoh, U.I. and Edet, A.O. (2011) 'Entrepreneurship education and career intentions of tertiary education students in Akwa Ibom and Cross River States, Nigeria', *International Education Studies*, Vol. 4, No. 1, pp.172–178.

Etemad, H., Wilkinson, I. and Dana, L.P. (2010) 'Internetization as the necessary condition for internationalization in the newly emerging economy', *J. Int. Entrep*. Vol. 8, No. 4, pp.319–342.

Fayolle, A. and Liñán, F. (2013) 'Entrepreneurial intentions: literature review and new researchperspectives', Paper presented at *The 3rd GIKA Annual Conference*, 7–9 July, Valencia.

Fisher Jr., W.P. (2007) 'Rasch measurement transaction', *Transaction of the Rasch Measurement SIG American Educational Research Association*, Vol. 21, No. 1, p.1095.

Fornell, C. and Larcker, D.F. (1981) 'Evaluating structural equation models with unobservable variables and measurement error', *Journal of Marketing Research*, Vol. 18, No. 1, pp.39–50 [online] https://doi.org/10.2307/3151312 (accessed 24 January 2019).

Franke, N. and Lüthje, C. (2004) 'Entrepreneurial intentions of business students: a benchmarking study', *International Journal of Innovation and Technology Management*, Vol. 1, No. 3, pp.269–88.

Fuller, B., Liu, Y., Bajaba, S., Marler, L.E. and Pratt, J. (2018) 'Examining how the personality, self-efficacy and anticipatory cognitions of potential entrepreneurs shape their entrepreneurial intentions', *Personality and Individual Differences*, Vol. 125, pp.120–125, ISSN 0191-8869, https://doi.org/10.1016/j.paid.2018.01.005.

Galloway, L. and Brown, W. (2002) 'Entrepreneurship education at university: a driver in the creationof high growth firms?', *Education þ Training*, Vol. 44 Nos. 8-9, pp.398–405.

Gartner, W.B. (1988) 'Who is an entrepreneur? Is the wrong question', *American Journal of Small Business*, Vol. 12, No. 4, pp.11–32.

Gelard, P. and Saleh, K.E., (2010) 'a model of entrepreneurship centers in Islamic Azad University South Tehran Branch', *Proceedings of the 1st International Conference on Entrepreneurship*, p.17.

Graham, M.W. and Messner, P.E. (1998) 'Principals and job satisfaction', *International Journal of Educational Management*, Vol. 12, No. 5, pp.196–202.

Hasbolah, H., Mamat, S.A., Abdullah, Z. and Sidek, S. (2020) 'A review on cyber entrepreneurship in Malaysia: past, present and future', *Journal of Critical Reviews*, Vol. 7, pp.2628–2636, DOI: 10.31838/jcr.07.19.513.

Hong, Z., Hong, T., Cui, Z. and Luzhuang, W. (2012) 'Entrepreneurship quality of college students related to entrepreneurial education: empirical study on psychological and behavioral characteristics', *Energy Procedia*, Vol. 17, pp.1907–1913.

Iakovleva, T., Kolvereid, L. and Stephan, U. (2011) 'Entrepreneurial intentions in developing and developed countries', *Education + Training*, Vol. 53, No. 5, pp.353–370.

Izedonmi, P.F. and Okafor, C. (2010) 'The effect of entrepreneurship education on students' intentions', *Global Journal of Management and Business Research*, Vol. 10, No. 6, pp.49–60.

Izquierdo, B. (2008) 'Competing models of entrepreneurial intentions: the influence of entrepreneurial self-efficacy and attitudes', Paper presented at *Internationalizing Entrepreneurship Education and Training, IntEnt2008 Conference*, Oxford, Ohio, USA.

Kautonen, T., van Gelderen, M. and Fink, M. (2015) 'Robustness of the theory of planned behavior in predicting entrepreneurial intentions and actions', *Entrepreneurship Theory and Practice*, Vol. 39, No. 3, pp.655–674.

Kautonen, T., Van Gelderen, M. and Tornikoski, E.T. (2013) 'Predicting entrepreneurial behaviour: a test of the theory of planned behaviour', *Applied Economics*, Vol. 45, No. 6, pp.697–707.

Kirchhoff, B.A. and Phillips, B.D. (1988) 'The effect of firm formation and growth on job creation in the United States', *Journal of Business Venturing*, Vol. 3, No. 4, pp.261–272.

Kline, R.B. (1998) *Principles and Practice of Structural Equation Modeling*, Guilford Press.

Kolbre, E., Piliste, T. and Venesaar, U. (2005) 'Entrepreneurship education and entrepreneurial initiative in Estonia', *Int. Ent. 2005 Conference Proceedings*, Surrey University, London.

Kolvereid, L. (1996) *Prediction of Employment Status Choice Intentions*, Working Paper Series, Henley Management College HWP.

Kolvereid, L. and Isaksen, E. (2006) 'New business start-up and subsequent entry into self-employment', *Journal of Business Venturing*, Vol. 2, No. 6, pp.866–885.

Kolvereid, L. and Moen, O. (1997) 'Entrepreneurship among business graduates: does a major in entrepreneurship make a difference?', *Journal of European Industrial Training*, Vol. 21, No. 4, pp.154–610.

Krueger, N. (1993) 'The impact of prior exposure to entrepreneurship on perceived new venture feasibility and desirability', *Entrepreneurship Theory and Practice*, Vol. 18, No. 2, pp.5–21.

Krueger, N., Reilly, M. and Carsrud, A. (2000) 'Competing models of entrepreneurial intentions', *Journal of Business Venturing*, Vol. 15, Nos. 5–6, pp.411–432.

Kuratko, D.F. (2005) 'The emergence of entrepreneurship education: Development, trends and challenges', *Entrepreneurship Theory and Practice*, Vol. 29, No. 5, pp.577–597.

Lian, J.W. and Yen, D.C. (2017) 'Understanding the relationships between online entrepreneurs' personal innovativeness, risk taking and satisfaction: comparison of pure-play and click-and-mortar', *Journal of Organizational Computing and Electronic Commerce*, Vol. 27, No 2, pp.135–151.

Liñán, F. (2004) 'Intention-based models of entrepreneurship education', *Piccolla Impresa/Small Business*, Vol. 3, pp.11–35.

Liñán, F. and Chen, Y.W. (2009) 'Development and cross–cultural application of a specific instrument to measure entrepreneurial intentions', *Entrepreneurship Theory and Practice*, Vol. 33, No. 3, pp.593–617.

Liñán, F., Nabi, G. and Krueger, N. (2013)' 'British and Spanish entrepreneurial intentions: a comparative study', *Revista de Economía Mundial*, Vol. 33, pp.73–107.

Locke, E.A. and Latham, G.P. (2002) 'Building a practically useful theory of goal setting and task motivation: a 35-year odyssey', *American Psychologist*, Vol. 57, No. 9, p.705.

Looi, K.H. and Khoo-Lattimore, C. (2015) 'Undergraduate students' entrepreneurial intention: born or made?', *Int. J. Entrepreneurship and Small Business*, Vol. 26, No. 1, pp.1–20.

Lüthje, C. and Franke, N. (2003) 'The making of an entrepreneur: testing a model of entrepreneurial intent among engineering students at MIT', *R&D Management*, Vol. 33, No. 2, pp.135–147.

Malhotra, N.K. (2010) *Marketing Research: An applied orientation 6/E*, Pearson Education.

Martin, L.M. and Tiu Wright, L. (2005) 'No gender in cyberspace? Empowering entrepreneurship and innovation in female-run ICT small firms', *International Journal of Entrepreneurial Behavior and Research*, Vol. 11, No. 2, pp.162–178.

Matlay, H. and Carey, C. (2007) 'Entrepreneurship education in the UK: a longitudinal perspective', *Journal of Small Business and Enterprise Development*, Vol. 14, No. 2, pp.252–263.

Miller, K., Alexander, A., Cunningham, J.A. and Albats, E. (2018) 'Entrepreneurial academics and academic entrepreneurs: a systematic literature review', *Int. J. Technology Management*, Vol. 77, Nos. 1-3, pp.9–37.

Mustafa, M.J., Hernandez, E., Mahon, C. and Chee, L.K. (2016) 'Entrepreneurial intentions of university students in an emerging economy: the influence of university support and proactive personality on students' entrepreneurial intention', *Journal of Entrepreneurship in Emerging Economies*, Vol. 8, No. 2, pp.162–179.

Nabi, G., Liñán, F., Fayolle, A., Krueger, N. and Walmsley, A. (2017) 'The impact of entrepreneurship education in higher education: a systematic review and research agenda', *Academy of Management Learning & Education*, Vol. 16, No. 2, pp.277–299.

Nambisan, S. (2017) 'Digital entrepreneurship: toward a digital technology perspective of entrepreneurship', *Entrepreneurship: Theory and Practice*, Vol. 41, No. 6, pp.1029–1055.

Nuttin, J., Lorion, R.P. and Dumas, J.E. (1984) *Motivation, Planning, and Action: A Relational Theory of Behavior Dynamics*, Leuven University Press.

Obschonka, M., Silbereisen, R.K., Schmitt-Rodermund, E. and Stuetzer, M. (2011) 'Nascent entrepreneurship and the developing individual: Early entrepreneurial competence in adolescence and venture creation success during the career', *Journal of Vocational Behavior*, Vol. 79, No. 1, pp.121–133.

Ooi, Y.K., Selvarajah, C. and Meyer, D. (2011) 'Inclination towards entrepreneurship among university students: an empirical study of Malaysian university entrepreneurial intention page 124 of 161 students', *International Journal of Business and Social Science*, Vol. 2, No. 4, pp.206–220.

Petti, C. and Zhang, S. (2014) 'Factors influencing technological entrepreneurship in Chinese firms: evidence from Guangdong', *Int. J. Technology Management*, Vol. 65, Nos. 1–4, pp.70–95.

Pruett, M., Shinnar, R., Toney, B., Llopis, F. and Fox, J. (2009) 'Explaining entrepreneurial intentions of university students: a cross-cultural study', *International Journal of Entrepreneurial Behaviour & Research*, Vol. 15, No. 6, pp.571–594.

Radosevich, R. (1995) 'A model for entrepreneurial spin-offs from public technology sources', *International Journal of Technology Management*, Vol. 10, Nos. 7–8, pp.879–893.

Reimers-Hild, C., King, J.W., Foster, J.E., Fritz, S.M., Waller, S.S. and Wheeler, D.W. (2005) 'A framework for the entrepreneurial learner of the 21st century', *Journal of Distance Learning Administration*, pp.5–8.

Rippa, P. and Secundo, G. (2018) 'Digital academic entrepreneurship: the potential of digital technologies on academic entrepreneurship', *Technological Forecasting and Social Change*, Vol. 146, pp.900–911, https://doi.org/10.1016/j.techfore.2018.07.013.

Roesnita, I. and Zainab, A.N. (2005) 'The pattern of e-book use amongst undergraduates in Malaysia: a case of to know is to use', *Malaysian Journal of Library and Information Science*, Vol. 10, No. 2, pp.1–23.

Schumpeter, J.A. (1936) 'The theory of economic development – an inquiry into profits, capital, credit, interest and the business cycle, Harvard University Press, Cambridge.

Schwarz, E.J., Wdowiak, M.A, Almer-Jarz, D.A. and Breitenecker, R.J. (2009) 'The effects of attitudes and perceived environment conditions on students' entrepreneurial intent', *Education + Training*, Vol. 51, No. 4, pp.272–291.

Segal, G., Borgia, D. and Schoenfeld, J. (2005) 'The motivation to become an entrepreneur', *International Journal of Entrepreneurial Behavior and Research*, Vol. 11, No. 1, pp.42–57.

Shapero, A. and Sokol, L. (1982) 'The social dimensions of entrepreneurship', in Kent, C., Sexton, D. and Vesper, K.H. (Eds.): *The Encyclopedia of Entrepreneurship*, pp.72–90, Prentice-Hall, Englewood Cliffs, NJ.

Shaver, K.G. and Scott, L.R. (1992) 'Person, process, choice: the psychology of new venture creation', *Entrepreneurship Theory and Practice*, Vol. 16, No. 2, pp.23–46, https://doi.org/10.1177/104225879201600204.

Singh, G. and de Noble, A. (2003) 'Views on self-employment and personality: an exploratory study', *Journal of Developmental Entrepreneurship*, Vol. 8, No. 3, pp.265–300.

Solesvik, M.Z. (2013) 'Entrepreneurial motivations and intentions: investigating the role of education major', *Education+ Training*.

Swan, W., Chang-Schneider, C. and McClarity, K. (2007) 'Do people's self-views matter?', *American Psychologist*, Vol. 62, No. 2, pp.84–94.

Tabachnick, B.G. and Fidell, L.S. (2007) *Using Multivariate Statistics*, 5th ed., Allyn and Bacon, New York.

Tam, H.W. (2009) *How and to What Extent Does Entrepreneurship Education Make Students More Entrepreneurial? A California Case of the Technology Management Program*, University of California, Santa Barbara.

Tomy, S. and Pardede, E. (2018) 'From uncertainties to successful start ups: a data analytic approach to predict success in technological entrepreneurship', *Sustainability*, Vol. 10, No. 3, p.602.

Turban, E., Leidner, D., McLean, E. and Wetherbe, J. (2008) *Information Technology for Management: Transforming Organizations in the Digital Economy*, 6th ed., p.4, Wiley PLUS, Hoboken, NJ.

Turker, D. and Selçuk, S. (2009) 'Which factors affect entrepreneurial intention of university students?', *Journal of European Industrial Training*, Vol. 33, No. 2, pp.142–159.

Ucbasaran, D., Westhead, P. and Wright, M. (2008) 'Opportunity identification and pursuit: does an entrepreneur's human capital matter?', *Small Business Economics*, Vol. 30, No. 2, pp.153–173.

van Gelderen, M. and Jansen, P. (2006) 'Autonomy as a start-up motive', *Journal of Small Business and Enterprise Development*, Vol. 13, No. 1, pp.23–32, https://doi.org/10.1108/14626000610645289

van Gelderen, M., Brand, M., van Praag, M., Bodewes, W., Poutsma, E. and van Gils, A. (2008) 'Explaining entrepreneurial intentions by means of the theory of planned behavior', *Career Development International*, Vol. 13, No. 6, pp.538–559.

Verheul, I., Stel, A.V. and Thurik, R. (2006) 'Explaining female and male entrepreneurship at the country level', *Entrepreneurship and Regional Development*, Vol. 18, No. 2, pp.151–183.

Wang, Y.S., Lin, S.J., Yeh, C.H., Li, C.R. and Li, H.T. (2016) 'What drives students' cyber entrepreneurial intention: the moderating role of disciplinary difference', *Thinking Skills and Creativity*, Vol. 22, pp.22–35.

Wee, K.N.L. (2004) 'A problem-based learning approach in entrepreneurship education: promoting authentic entrepreneurial learning', *Int. J. Technology Management*, Vol. 28, Nos. 7/8, pp.685–701.

Wu, Y-C.J. and Wu, T. (2017) 'A decade of entrepreneurship education in the Asia Pacific for future directions in theory and practice', *Management Decision*, Vol. 55, No. 7, pp.1333–1350.

Zhu, K., Kraemer, K.L. and Dedrick, J.(2004) 'Information technology payoff in e-business environments: an international perspective on value creation of e-business in the financial services industry', *Journal of Management Information Systems*, Vol. 21, No. 1, pp.17–54.

Zhu, K., Kraemer, K.L. and Xu, S. (2006) 'The process of innovation assimilation by firms in different countries: a technology diffusion perspective on e-business', *Management Science*, Vol. 52, No. 10, pp.1557–1576.