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經營學碩士 學位論文

The Effects of Higher Education on
University Students' Entrepreneurial
intentions in China

중국의 고등교육이 대학생 창업에 미치는 영향



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國文抄錄

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이 논문은 고등교육 배경을 갖춘 중국대학생들과 이들의 기업창업활동 간의 관계를 알아보는데 그 목적이 있다.

이것을 위해 Ajzen의 TPB(theory of planed behavior)모형에서 제시한 구조방정식을 사용하여 중국대학생들의 창업의도가 어떻게 형성되고 있는가를 실증 분석하였다. 이 분석에 필요한 자료는 우한지역에 있는 중부권 일반대학 학생들로부터 구해졌다.

Ajzen의 이론에 의하면 대학생들의 창업은 개인의 태도와 인지된 행동조정의 결합으로 설명될 수 있다. 실증분석 결과 중국의 경우 주관적인 행동규범보다는 개인의 태도가 교육적 배경과 관계없이 창업의지에 큰 영향을 미치는 것으로 나타났다.그러나 학문적 전공은 창업활동에 영향을 미치는 주요요인으로서 나타났다.

중국에서 대학생 졸업자 노동시장의 변화에 적응하고 지속적인 경쟁이익을 유지하기 위해서 고등교육기관은 중국에서 대학생들의 창업활동을 고양하기 위해서 창업활동에 대한 다양한 기술과 능력을 배양하기 위해 노력할 필요가 있다.

이논문은 중국에서 고등교육과 대학생의 창업활동 간의 관계를 분석함으로써 중국 노동시장을 좀 더 포괄적으로 이해하는데 도움을 주는 것으로 생각된다.

Abstract

The Effects of Higher Education on University Students' Entrepreneurial Intentions in China

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This paper aims at the relationship between the Chinese university students' higher educational background and their entrepreneurial intentions.

I take use of the Ajzen's TPB(theory of planmed behavior) model with data which were collected from students of Center China Normal University in Wuhan China, to test for the formation of Chinese university students' entrepreneurial intentions using structural equation modeling.

Chinese university students entrepreneurial intentions can be explained by the combimation of personal attitude and perceived behavioral control. Subjective norm does not contribute significantly to the predication of entrepreneurial intentions of Chinese university. Personal attitude is the main

predictor of behavioral intentions, irrespective of students' educational background. However, academic major is an important factor to influence entrepreneurial intention identified in this study.

In order to make adjustment to the change of graduate labour market and the quest for sustainable competitive advantage in China, it is necessary for the higher educational institutions to integrate the change of mindset, skills and abilities about entrepreneurship in their general academic education for the sake of nurturing university students' entrepreneurial intentions in China.

The paper provides comprehensive empirical evidence about the impact of higher education on entrepreneurial intentions of university students in mainland China and thus fills an important gap in the entrepreneurship literature.



Chapter1. Introduction

1.1 The background and purpose

Surveys of Chinese university students indicate that although conditions for entrepreneurship have much improved than before, only a small number of students start up a business after graduation. Compare with the total entrepreneurial activity (TEA) for China in 2005 at the rate of 13.7 per cent, there are only 2 to 6 per cent of Chinese students choose entrepreneurship as a career option. Seeing entrepreneurship as a driving force of regional economy and an effective way to ease employment pressure of university students, the Chinese government has made great efforts to support entrepreneurial behaviors.

Because the decision-making process of creating new venture can be regarded as a reasoned behavior or planned behavior, there are strong relationships between intentions toward behavior and actual act¹. With an understanding of university students' entrepreneurial intentions, we can better predict whether they will take real action to start a new business. And promoting entrepreneurial intentions of university students can effectively increase possibility that the students will engage in entrepreneurship.

Recently, entrepreneurial intentions of university students have received considerable interests among researchers². Previous studies maintain that entrepreneurs are cultivated during their lifetime, and education is very important to build entrepreneurship in people's mind. Because educational background is a key demographic variable, it is often included in the analysis by researchers³. Since previous works were focused on broader factors than educational background, they cannot show the relationship between educational

¹ Ajzen, 1991; Sheppard et al., 1988

² Tkachev and Kolvereid, 1999; Autio et al., 2001; Veciana et al., 2005

³ Davidsson, 1995; Lin'án and Chen, 2006; Kolvereid and Isaksen, 2006

background, university students' entrepreneurial perceptions and, through them, entrepreneurial intentions. Therefore, whether education influences entrepreneurial perceptions and intentions "requires further research"⁴.

Traditionally Chinese universities have educated graduates for employment in the public sector and the established firms and the role of Chinese universities was less important in developing future entrepreneurs. With the rapid change of economic and social conditions in China, Chinese universities have experienced considerable growth and undergone striking changes. Further recognition of cultivating entrepreneurship as a function of university is evidenced by the growing number of debates and publications in professional journals. Hence, it is important to understand the formation of entrepreneurial intention of Chinese university students and its linkage with different educational backgrounds.

In general, there is a need to better comprehend the Chinese students' entrepreneurial intentions and the factors affecting intentions. The main purpose of this paper is to address this need. First, we aim at testing the adequacy of Ajzen's theory of planned behavior (hereafter TPB) to predict the entrepreneurial intentions of Chinese university students in a sample of university students in Wuhan, China. Second, we intend to correlate the four components in the model of entrepreneurial intentions of Chinese University students with different educational backgrounds.

The results are expected to shed some light on a number of issues. It will test the applicability of Ajzen's TPB model to Chinese university students. It will also serve as a clarification of relationships between educational background and the antecedents of intentions. Finally, policy-makers could find useful insights from the research.

⁴ Collins et al., 2004

1.2 The plan of the paper

The paper is organized in four parts:

(1) A literature review on prior studies on entrepreneurial intentions models and theoretical frameworks of the relationship between educational background and intentions.

(2) The methodology of the research.

(3) Results and discussions.

(4) The concluding remarks.

The TPB model was adopted and tested for the formation of Chinese university students' entrepreneurial intentions using structural equation modeling. Data were collected from students of Centre China Normal University in Wuhan, China. In response to the change of graduate labour market and the quest for sustainable competitive advantage in China, higher educational institutions have to integrate the change of mindset, skills and abilities about entrepreneurship in their general academic education in order to nurture university students' entrepreneurial intentions in China.

Chapter2. Entrepreneurial intention and educational

background

2.1 Literature review

Behavioral intention is a necessary process before taking any action. It is the decision to initiate behavior. As a psychological process, intention has been examined by a number of theorists and researchers ⁵. Relevant researches on behavior indicate that intention has better explanation of ability than other factors just like psychological character.

Entrepreneurial intention is a state of mind that people wish to create a new firm or a new value driver inside existing organizations. It is a driving force of the entrepreneurial activity. Researches in entrepreneurial intention make inquiry into why some people choose to be self-employed or start their own businesses while others prefer traditional salary-based jobs. When researchers try to explain the phenomenon from the viewpoint of entrepreneurs' personalities, ability of innovation and opportunity exploitation on the range of economics, or the conditions and resources facing entrepreneurs, the entrepreneurial intention perspective provides a new research focus and offers a means to better explain and predict entrepreneurship, thereby breaking down the boundaries between disciplines.

The reason for studying entrepreneurial intention can be categorized into two aspects:

(1) In the individual aspects, in order to become novice, serial and even portfolio entrepreneurs, individuals must first become nascent entrepreneurs⁶. Therefore, the process that underlies the emergence of entrepreneurial intentions and behavior is of the uttermost importance .

⁵ Bird, 1988

⁶ Westhead and Wright, 1998

(2) emergence of entrepreneurial intentions and behavior is of the uttermost

importance⁷.

(3) In the social aspects, Global Entrepreneurship Monitor Research reports there are correlations between a country's per capita GDP, national economic growth rate and the level and type of entrepreneurial activity in the country. In this sense, the level of entrepreneurial intention reflects economic potential and economic environment of the country.

2.2 Entrepreneurial intention model

There are numerous approaches to the study of entrepreneurial intention, each addressing different facets of intentional entrepreneurial activity. Ajzen's (1991) theory of planned behavior and Shapero's (1982) model of the "entrepreneurial event" (hereafter SEE) are two similar intention models. TPB is a general model to explain individual behavior and appears useful for assessing entrepreneurial intentions when being adopted by entrepreneurship scholars.

TPB identifies three attitudinal antecedents of intentions: personal attitude toward the behavior, subjective norm and perceived behavioral control. Personal attitude is a reflection of beliefs and opinions held by an individual about the behavior. Subjective norm refers to the degree to which the behavior will comply with the wishes of important others. And perceived behavioral control is defined as a person's perception of his/her ability to perform the specific behavior.

According to the SEE model, the personal choice to start a new venture depends on three elements: perceived feasibility, perceived desirability, and the propensity to act. Krueger et al. (2000) compared TPB with SEE in their study. They pointed out that perceived behavioral control in TPB and perceived desirability in SEE are

⁷ Drnovsek and Eriksona, 2005

associated with perceived self-efficacy. And TPB's other two antecedents correspond to

SEE's perceived desirability. As their results illustrate, there is an inherent consistency in these two models. Table I shows a comparison of studies on entrepreneurial intentions based on the models of Ajzen (1991) and Shapero (1982).

The effectiveness of the TPB model has been tested in studies listed in Table I. And selected demographic variables are also listed in Table I. It is a valuable tool for understanding the process of new venture creation regardless of cultural differences. But the question is whether it will serve as a proper cognitive model to the entrepreneurial decision of mainland Chinese sample. Hence, referring to Ajzen's TPB model, we propose the following hypotheses:

H1. Personal attitude towards entrepreneurship is positively related to Chinese university students' entrepreneurial intentions.

H2. Subjective norm is positively related to Chinese university students' entrepreneurial intentions.

H3. Perceived behavioral control is positively related to Chinese university students' entrepreneurial intentions.



【Table I】 Comparison of entrepreneurial intention studies

Author(year)	Basic model	Demographic variables	Variables	Unit of analysis	Findings
Kolvereid(1996)	TPB	Family background Gender Self-employment Experience	Attitude Subjectivenorm perceived behavioral control	Norwegian business school students	Self-employment exoerence, ge nder,and family background only indirectly influence self-employment intentions through their effect on attitude,subjective norm and perceived behavioral control
Veciana et al (2005)	TPB and SEE	Gender Self-employment Experience	New venture New venture Desirability	Puerto rico and catalonia University students	The relationship between demogr-aphic variables and entrepreneurial intentions are not the same with different country students
Linan and Chen (2006)	TPB	Role model Self-employment Experience Work experience Personal date(age, Gender)	Personal attraction Social Norms Self-efficacy	Spanish and Taiwan university students	Demographic variables except gender have relatively few significant effect over the antecedents of the entrepreneurial
Segal et al.(2005)	SEE		Self-efficacy Tolerance for risk Net desirability for Self-employment	USAundergraduate business students	Net desirability self-employment is determinant factors for entrepreneurial intention
Souitaris et al (2007)	TPB	Entrepreneurship programme	Attitude Subjective norm	London,UK and Grenoble France university students	Entrepreneurship programmes are a source of Trigger-events students(arouse emotions and change mindsents)

2.3 The theoretical framework for the relationship between educational background and entrepreneurial intention

From a societal perspective, both entrepreneurship and the educational system are important for economic growth, but the importance of education for entrepreneurship has been acknowledged only recently⁸. Education is one of the biggest and most important ongoing investments people make. Through access to education, people can not only gain knowledge and develop ability, but also have more opportunities to improve their quality of life. There are plenty of evidence in daily life and scientific literature to show that improving educational level will increase future earnings of individuals and help people achieve overall success⁹. But very few researches using the TPB model have been done concerning the relationship between educational background and entrepreneurial intention.

The potential impacts of higher education on students include three aspects: the first is about their personal development, including changes in attitudes and values; the second is to do with changes in their abilities; and the third with possible social impacts¹⁰. These aspects are consistent with the components of the TPB model. Many other literatures¹¹ show that “antecedents” in the TPB model are affected by situational factors and demographic variables. Among them, educational background is one of the most important factors.

Le (1999) argues that there are several channels through which the level of education might influence the propensity to become self-employed. On the one hand, the impact of educational attainment can be explained by the Lucas’ (1978) model. In this model, education would enhance an individual’s managerial ability, which in

⁸ Kuip and Verheul, 2003

⁹ Angrist and Krueger, 1999

¹⁰ West and Hore, 1989

¹¹ Lee and Wong, 2004; Lin˘an and Chen, 2006

turn increases the probability of entrepreneurship. The other channel of influence as indicated by Le has an opposite, negative effect on selection into entrepreneurship. It points to the possibility that higher levels of education might generate better outside options¹² and thus decrease the likelihood of entrepreneurship as the preferred choice¹³ argued that the demographics only indirectly influence intentions and suggests the inclusion of demographic characteristics to assess the sufficiency of the TPB model.

Educational background and personal attitudes. Personal attitudes include emotional factors and factors to evaluate. The former are based on person's subjective psychological status, while the later are judged by "expectancy-value model". Because attitudes are open to change, entrepreneurial attitudes may be influenced by educators and practitioners. By cultivating an attitude of innovation, achievement, self-esteem, educators can change students' perception and feeling of entrepreneurship¹⁴. There can be two reasons for highly educated people not to choose self-employment: first, highly educated persons earn more as employees than they would as self-employed. Second, the stream of earnings is less secure as self-employed than as employee, due to higher inherent risks in the operation of small firms compared to large ones or the public sector¹⁵. Hence, the fourth hypothesis to be tested under the present circumstance is:

H1a. It is expected that university students who have a low level of education are more interested in entrepreneurship.

While Kolvereid and Moen's (1997) research results indicate that graduates with an entrepreneurship major have stronger entrepreneurial intentions than other graduates of Norwegian business school, Levenburg et al.'s (2006) study failed to reveal a

¹² i.e. more lucrative paid wage employment under better working conditions

¹³ Van der Sluis et al., 2004. Ajzen (1991)

¹⁴ Robinson et al., 1991

¹⁵ Kangasharju and Pekkala, 2002

difference between business and non-business majors of interest in entrepreneurship among US university students. De Young (1996) pointed out that students are attracted to various academic major may in part because of their personal beliefs and psychological characteristics. Based on the arguments above, we arrive at the fifth and sixth hypothesis:

H1b. Differences and a relationship (positive or negative) are expected between the effects of academic major in determining entrepreneurial interests.

H1c. It is expected that university students who have received entrepreneurship education are more interested in entrepreneurship.

Educational background and subjective norm. In the TPB model, subjective norm incorporates external factors to the model, which measure the perceived social pressure to perform or not perform the entrepreneurial behavior. In particular, it would refer to the perception of those “reference people” such as families, friends and colleagues, whether they will approve the decision of being an entrepreneur¹⁶. Some early studies¹⁷ of entrepreneurial intentions found that the relationship between subjective norm and entrepreneurial intentions tended to be very weak. In this case, some studies have simply omitted subjective norm¹⁸. But it cannot be denied that the expectancy of The impact of higher education 757 families and other key persons have significant influence on the career choices of university students. Since China initiated its economic reform in 1978, people’s perception of entrepreneurship has changed greatly and more efforts of encouraging higher educated people to be entrepreneur have been made.

H2a. University students with low level of education perceived more social pressure of not being an entrepreneur than those who have higher education degrees.

¹⁶ Lin~a’n and Chen, 2006

¹⁷ Krueger et al., 2000; Autio et al., 2001

¹⁸ Veciana et al., 2005

Educational background and perceived behavioral control. As for entrepreneurial activity, perceived behavioral control refers to the perception of easiness or difficulty in the fulfillment of creating a new venture. It is based on the evaluation of one's controllability and self-efficacy during the process of new venture development. A high level of perceived behavioral control should strengthen a person's intention to perform the behavior, and increase his/her effort and perseverance. Since education has two principle functions: knowledge transfer and ability development, it would change a person's perception of his or her ability to perform the intentional behavior. As Ferrante and Sabatini (2007) pointed out:

The connection between education and general cognitive abilities is a two-way street: codified knowledge acquired through education helps people to better understanding the general rules which govern the world they live in. Moreover, education enhances the ability to acquire and use codified information about specific aspects of working and non working life. Hence, appropriately explored data on educational attainment should reveal the cognitive abilities possessed by individuals.

Ewert and Baker (2001) suggest higher education differentially prepares people humanistic and technical. Then individual in different academic major fields who grasp different knowledge which may act as a mediate role for entrepreneurship abilities. Richardson's (1993) study revealed the significant difference between perceived contributions of education to alumni with different academic majors. The results show some academic major such as communication, human ecology facilitate growth and development in personal/social skills, while some academic majors as engineering and science facilitate growth and development in quantitative skills.

Accordingly, the next three hypotheses are to be tested in present circumstance are:

H3a. Differences are expected between the effects of academic major in determining perceived behavioral control.

H3b. It is expected that university students who have good academic achievement have more perceived behavioral control than those who have bad academic achievement.

H3c. It is expected that university students who have received entrepreneurship education have more perceived behavioral control than those who have not.



Chapter3. Methodology

3.1 Research framework

In exploring the relationship between Chinese university students' educational background and their entrepreneurial intention, we decided first to investigate entrepreneurial intention based on Ajzen's (1991) model. This model is one of the robust models that we identify since it provides good results in very diverse fields including the choice of professional career ¹⁹.

Educational background was measured by the respondent's educational level, academic major, academic achievement, and entrepreneurship education. All the hypotheses in Section 2 are described in Figure 1.

H1, H2 and H3 describe the impact of personal attitude, subjective norm, and perceived behavioral control to entrepreneurial intention. H1a, H1b, H1c, H2a, H3a, H3b and H3c are hypotheses about the relationship between educational background and TPB components.



3.2 Research design

Data. A number of steps were taken in the construction of the questionnaire:

- (1) Making reference to related recent studies ²⁰.
- (2) Developing some items according to theory.
- (3) Taking into account advice from senior statisticians of some business consulting companies and professors.

¹⁹ Lin~a'n and Chen, 2006

²⁰ Van Auken et al., 2006; Levenburg et al., 2006; Davidsson, 1995; Krueger et al., 2000; Zampetakis and Moustakis, 2006; Kristiansen and Indarti, 2004; Souitaris et al., 2007; Lu~thje and Franke, 2003

Entrepreneurial intention and its antecedents have been measured through a Likert-type scale with seven items. In particular, close reference was made to the methods used in the Entrepreneurial Intention Questionnaire (EIQ) developed by Lin~a~n and Chen (2006). The EIQ was used to measure entrepreneurial intentions of Spanish and Taiwanese samples.

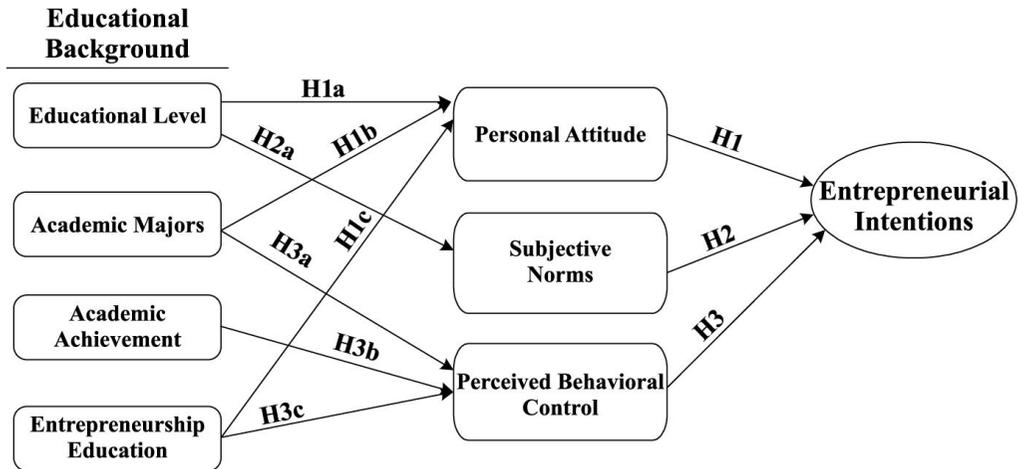
The questionnaire has seven sections:

- (1) educational background;
- (2) personal attitude;
- (3) subjective norm;
- (4) perceived behavioral control;
- (5) entrepreneurial intention;
- (6) entrepreneurship education;
- (7) demographic variables.



【Figure1】 Hypothetical model of the relationship between

educational background and entrepreneurial intentions



The data for this research were obtained from students of Center China Normal University in Wuhan China. We sent out 180 questionnaires in different classes. The students took 15 minutes to complete the anonymous questionnaires in class. After class, we received 162 completed questionnaires. There are 150 validity questionnaires, validity rate 92.6 per cent (see Table II).

Data analysis. The statistical analysis was made in two parts: first, the path analysis was to define the relationship between entrepreneurial intention and its antecedents; and second, the descriptive statistical was to examine the correlation of educational background and antecedents of entrepreneurial intention. These analyses were accomplished by using the Amos 7.0 and SPSS version 15.0.

【Table II】 Sample characteristics

Variable		Frequency	Valid per cent
Sex	Male	94	63.7
	Female	53	36.3
	Missing value	3	
Age	14-18	4	2.7
	19-25	133	90.5
	26-30	9	6.1
	Older than 30	1	0.7
	Missing value	3	
Educational level	Diploma and Undergraduate	86	57.3
	Postgraduate	64	42.7
Academic major	Entrepreneurship related majors	55	37.2
	Non-Entrepreneurship related majors	93	62.8
	Missing value	2	
Entrepreneurship education	Yes	33	22.4
	No	114	77.6
	Missing value	3	
Academic achievement	Low	79	52.7
	High	71	47.3

Note: Entrepreneurship related majors, which include Business Administration and Economics;
 Non- Entrepreneurship related majors, which include Biology,Physics,Mathematics,History
 Medicine,Psychology,Geography,Law and so on

Chapter4. Results and discussion

4.1 Entrepreneurial intentions and its antecedents

Through reliability analysis of the questionnaire, inappropriate items were excluded and the following items were retained as the construction of structural equation modeling analysis (see Table III).

【Table III.】 Reliability analysis for Chinese university student entrepreneurial intentions model

Construct	Indicator	Correlated item-total correlation	Cronbach's alpha
Personal attitude	12 attitude	0.598	0.778
	13a attitude	0.652	
	13b attitude	0.583	
	13c attitude	0.500	
Subjective norm	19a culture	0.490	0.717
	19b status	0.567	
	19c acceptable	0.576	
Perceived behavioral control	20 ability	0.614	0.765
	21 ability	0.563	
	22 ability	0.573	
	24 ability	0.522	
Entrepreneurial intentions	26 intention	0.693	0.831
	27a intention	0.717	
	27c intention	0.597	
	28 intention	0.587	
	29 intention	0.561	

The Cronbach's alpha of the constructs relating to personal attitude, subjective norm, perceived behavioral control and entrepreneurial intentions is 0.778, 0.717, 0.765 and 0.831 respectively, thus all exceeding the 0.60 cut-off value for reliability consistency.

After running the statistical software (Amos 7.0) on the total sample, Figure 2 presents the results for the entrepreneurial intention model.

The comparative fit index is one of the most commonly reported fit indices. This index

uses a baseline model for comparison purposes, meaning that the fit is examined in regard to an independence model of fit, which is the standard of no fit at all. The measure varies from zero to one with one indicating a perfect fit and the general rule of thumb for minimum acceptable fit is 0.90.

The root mean square error of approximation (RMSEA) is a measure based on population discrepancy. The rule of thumb for RMSEA is that values of 0.05 or less indicate a close fit, 0.06-0.08 a reasonable fit, and values of 0.10 the upper limit of acceptable fit²¹.

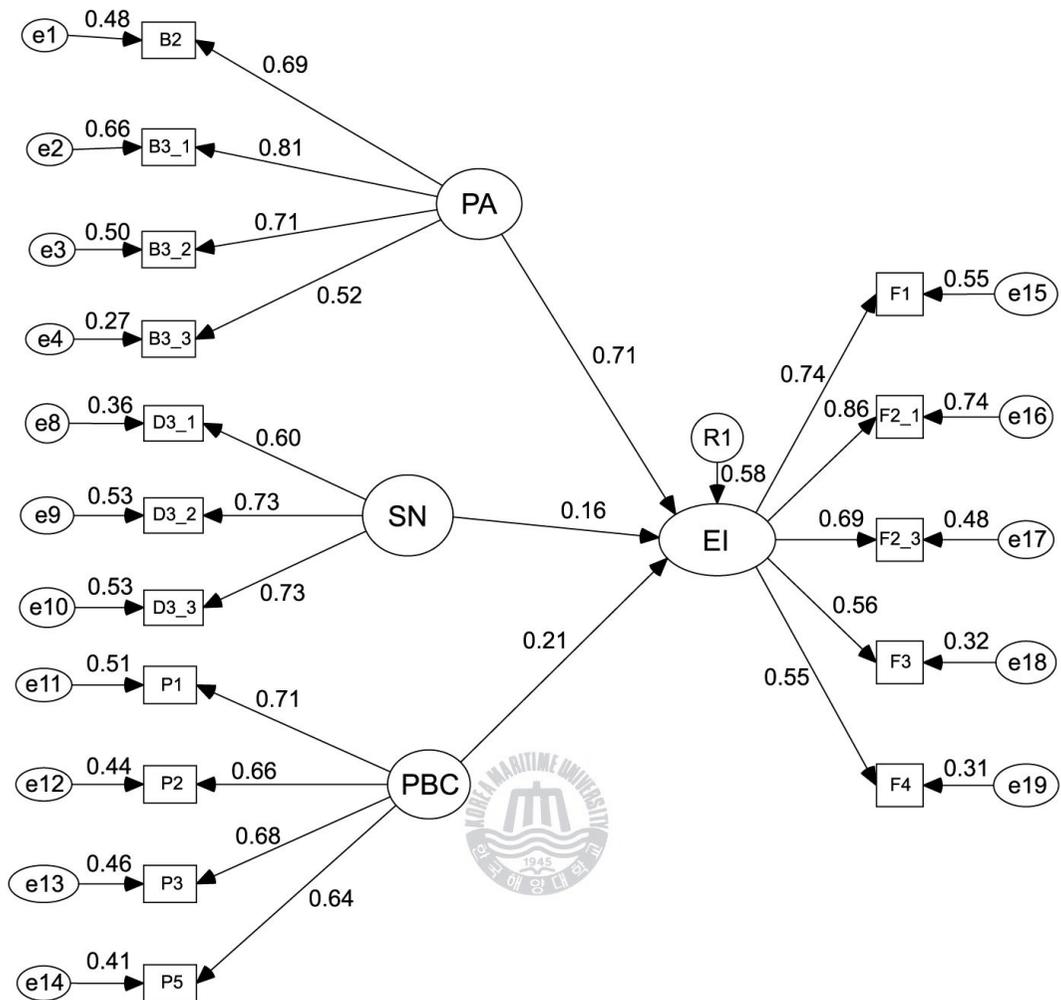
In this structural equation model, the CFI indicated a proper level of fit of 0.89. It is very close to the fit index 0.90. The RMSEA values were also acceptable (0.072). These suggest a reasonably good-fitting model because they fit into normal parameters.

Table IV shows the regression estimates between entrepreneurial intentions and its hypothesized determinants and p-values for significance. It suggests that personal attitude has a significant and positive impact on entrepreneurial intentions.



²¹ Arbuckle, 1999; Byrne, 2001

【Figure2】 Estimations of the entrepreneurial intention model for Chinese university students



Key: PA = Personal Attitude
 SN = Subjective norm
 PBC = Perceived Behavioral Control
 EI = Entrepreneurial Intentions

Notes: chi-square = 214.9, df = 101, CFI (0.89), RMSEA (0.072), P-close = 0.000

Besides the strong positive effect of personal attitudes on behavioral intentions, perceived behavioral control also has an additional positive effect on entrepreneurial intentions. Though subjective norm has a positive impact on entrepreneurial intention, it is

not significant at the 0.05 level.

Hence, H1 and H3 receive strong support, H2 is not verified. The result is found to be consistent with studies conducted by Krueger et al. (2000) and Autio et al. (2001). The high positive correlation between personal attitude and intentions reveals that there are few respondents with a high attitude and low intentions. And the impact of personal attitude on behavioral intention is greater than the effect of perceived behavioral control.

【Table IV】 Regression weights of entrepreneurial intention model

			Estimate	SE	CR	<i>P</i>	label
EI	←	PA	1.188	0.236	5.025	*	
EI	←	SN	0.216	0.112	1.931	0.053	
EI	←	PBC	0.336	0.137	2.451	0.014	
P5	←	PBC	1.000				
P3	←	PBC	1.033	0.173	5.981	*	
P2	←	PBC	1.240	0.210	5.896	*	
P1	←	PBC	1.271	0.208	6.117	*	
D3_3	←	SN	1.000				
D3_2	←	SN	1.292	0.235	5.504	*	
D3_1	←	SN	0.980	0.182	5.384	*	
F1	←	EI	1.000				
F2_1	←	EI	1.141	0.119	9.579	*	
F2_3	←	EI	0.864	0.110	7.852	*	
F3	←	EI	0.615	0.097	6.375	*	
F4	←	EI	0.604	0.096	6.267	*	
B3_3	←	PA	1.000				
B3_2	←	PA	1.415	0.255	5.559	*	
B3_1	←	PA	1.515	0.258	5.871	*	
B2	←	PA	1.395	0.254	5.500	*	

Note:* The regression weight is significantly different from zero at the 0.001 level (two-tailed)

4.2 Educational background and TPB components

Educational level and TPB components. The mean value for the total four-item

constructs measurement of personal attitude of respondents who are with diploma and undergraduate is 19.32 while postgraduate respondents' is 17.45 (Table V). And the t-test (Table VI) shows the difference between the mean values is significant at the 0.05 level, which indicates the respondents who are with diploma and undergraduate degree are more interested in start-up than those who are with postgraduate degree. So H1a is verified. But differences of subjective norm of postgraduate versus diploma and undergraduate respondents are not big and significant (see Tables V and VI). H2a is not verified. Mean entrepreneurial intention of diploma and undergraduate group amounted to 23.36 (versus postgraduate's is 21.13), indicating that diploma and undergraduate students are more willing to be entrepreneurs than their postgraduate counterpart.

Academic major and TPB components. H1b and H3a were tested using ANOVA analysis. The result shows that differences exist in personal attitude, perceived behavioral control and entrepreneurial intentions among university students with different academic majors (see Table VII). H1b and H3a receive strong support.

The "Non-ERM" students have lower attitude (Mean \bar{x} 16.86, Table VIII) towards start-up compared with "ERM" (Mean \bar{x} 19.02, Table VIII) and "Engineering" students (Mean \bar{x} 19.76, Table VIII). The mean difference of personal attitude between "Non-ERM" group and "Engineering" group is significant at 0.05 level (Table IX).

The mean value for perceived behavioral control of "Non-ERM" is 12.82, which is significantly smaller than that of "Engineering" group (Mean \bar{x} 15.1190) and is smaller but not significantly than that of "ERM" group (Mean \bar{x} 13.6000), indicating that "Non-ERM" students feel they possess less ability at creating a new venture. The result shows the "Engineering" group is the most confident of their entrepreneurial capability than other groups.

【Table V】 Means and standard deviations of the TPB components; diploma and undergraduate versus postgraduate

	Std.	std.error
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	Educational level	<i>N</i>	Mean	deviation	mean
Personal attitude	Diploma and Undergraduate	85	19.3176	4.31556	0.46809
	Psstgraduate	64	17.4571	4.95353	0.61919
Subjecttive norm	Diploma and Undergraduate	86	8.6628	3.73414	0.40266
	Psstgraduate	63	8.0159	3.70044	0.46621
Perceived behaviorl control	Diploma and Undergraduate	86	13.9767	4.50614	0.48591
	Psstgraduate	63	13.5397	3.43992	0.43339
Entrepreneurial intentions	Diploma and Undergraduate	85	23.3647	5.80814	0.62998
	Psstgraduate	63	21.1270	6.41443	0.80814



**【Table VI】 . Independent samples test of the TPB components;
diploma and undergraduate versus postgraduate**

		Levene's test for equality of variances		t-test for equality of means			Mean difference	Std.error difference
		F	Sig.	t	df	Sig. (two-tailed)		
Personal attitude	Equal variances assumed	1.084	0.300	2.499	147	0.015	1.86452	0.76126
	Equal variances not assumed			2.402	124.927	0.018	1.86452	0.77621
Subjective norm	Equal variances assumed	0.066	0.797	1.049	147	0.296	0.64692	0.61690
	Equal variances not assumed			1.050	134.434	0.296	0.64692	0.61603
Perceived behavioral control	Equal variances assumed	1.711	0.193	0.644	147	0.520	0.43706	0.67834
	Equal variances not assumed			0.671	146.727	0.503	0.43706	0.65110
Entrepreneurial intentions	Equal variances assumed	0.720	0.397	2.216	146	0.028	2.23772	1.00961
	Equal variances not assumed			2.184	125.926	0.031	2.23772	1.02468



The mean value for perceived behavioral control of “Non-ERM” is 12.82, which is

significantly smaller than that of “Engineering” group (Mean $\frac{1}{4}$ 15.1190) and is smaller but not significantly than that of “ERM” group (Mean $\frac{1}{4}$ 13.6000), indicating that “Non-ERM” students feel they possess less ability at creating a new venture. The result shows the “Engineering” group is the most confident of their entrepreneurial capability than other groups.

On the entrepreneurial intentions side, the intentions of becoming an entrepreneur of “Engineering” students is higher than students from the others majors. Again, the comparison shows the lowest levels of entrepreneurial intentions when the students are from “Non-ERM” course.

Academic achievement and TPB components. Respondents were classified in low versus high academic achievement groups using median split. T-test analysis (Tables X and XI) shows that among respondents who score high on academic achievement, mean value for personal attitude ($t \frac{1}{4}$ 3.428, $p < 0.05$) and entrepreneurial intentions ($t \frac{1}{4}$ 2.120, $p < 0.05$) are higher and significant than low academic achievement group. But the difference of mean value for perceived behavioral control is not significant at 0.05 level. So H3b did not receive support.

Entrepreneurship education and TPB components. H1c and H3c were tested using t-test analysis, and the analysis result shows no significant difference for the three antecedents of entrepreneurial intentions between students who had entrepreneurship education and who did not have. But students who had entrepreneurship education show a greater intention to start-up than those who did not have (see Tables XII).

【Table VII】 ANOVA analysis of the TPB components; ERM,

non-ERM and engineering

		Sum of squares	df	Mean square	F	Sig.
Personal attitude	Between groups	216.127	2	108.064	5.245	0.006
	Within groups	2966.621	144	20.602		
	Total	3182.748	146			
Subjective norm	Between groups	2.190	2	1.095	0.078	0.925
	Within groups	2022.708	144	14.047		
	Total	2024.898	146			
Perceived behavioral control	Between groups	123.151	2	61.576	3.794	0.025
	Within groups	2336.985	144	16.229		
	Total	2460.136	146			
Entrepreneurial intentions	Between groups	539.487	2	269.744	7.930	0.001
	Within groups	4864.026	143	34.014		
	Total	5403.514	145			



【Table VIII】 Means and standard deviations of the TPB components;

ERM, Non-ERM and engineering

Academic major		N	Mean	std.deviation	Std.error	95% confidence interval for mean			
						Minimum		Maximum	
Personal attit	ERM	55	19.0182	3.98837	0.53779	17.9400	20.0964	8.00	28.00
	Non-ERM	50	16.8600	5.09106	0.71998	15.4131	18.3069	4.00	27.00
	Engineering	42	19.7619	4.51993	0.69744	18.3544	21.1704	10.00	28.00
	Total	147	18.4966	4.66901	0.38509	17.7355	19.2577	4.00	28.00
Subject norm	ERM	55	8.5455	3.64549	0.49156	7.5599	9.5310	3.00	15.00
	Non-ERM	50	8.3000	3.397055	0.56152	7.1716	9.4284	3.00	15.00
	Engineering	42	8.2857	3.60410	0.55612	7.1626	9.4088	3.00	15.00
	Total	147	8.3878	4.36993	0.58924	12.4186	14.7814	3.00	15.00
Perceivedbehavioral									
control	ERM	55	13.6000	4.36993	0.58923	12.4186	14.7814	5.00	28.00
	Non-ERM	50	12.8200	3.53807	0.50036	11.8145	13.8255	5.00	20.00
	Engineering	42	15.1190	4.10949	0.63441	13.8384	16.3997	6.00	25.00
	Total	147	13.7687	4.10491	0.33857	13.0096	14.4378	5.00	28.00
Entrepreneurial									
intentions	ERM	55	22.9091	5.32038	0.71740	21.4708	24.3474	10.00	35.00
	Non-ERM	50	19.9600	6.52768	0.92315	18.1049	21.8151	5.00	33.00
	Engineering	41	24.7561	5.58471	0.87219	22.9933	26.5189	13.00	35.00
	Total	146	22.4178	6.10456	0.50522	21.4193	23.4163	5.00	35.00

【Table IX】 Multiple comparisons of the TPB components;ERM,

Non-ERM and engineering

Dependent variable	(I)Academic	(J)Academic major	Mean difference(I,J)	Std.error	Sig.error	%95 confidence interval	
Personal attitude	ERM	Non-ERM	2.15818	0.88691	0.055	-0.0355	4.3591
		Engineering	-0.74372	0.93010	0.727	-3.0443	1.5568
	Non-ERM	ERM	-2.15818	0.88691	0.055	-4.3519	0.0355
		Engineering	-2.90190	0.95002	0.011	-5.2517	-0.5521
	Engineering	ERM	0.74372	0.93010	0.727	-1.5568	3.0443
		Non-ERM	0.20190*	2.90190	0.001	0.5521	5.2517
Subject norm	ERM	Non-ERM	0.24545	0.24545	0.945	-1.5659	2.0568
		Engineering	0.25974	0.76801	0.944	-1.6399	2.159
	Non-ERM	ERM	-0.24545	0.73234	0.945	-2.0568	1.5659
		Engineering	0.01429	0.78446	1.000	-1.9260	1.954
	Engineering	ERM	0.25974	0.76801	0.944	-2.1594	1.639
		Non-ERM	-0.01429	0.78446	1.000	-1.9546	1.926
Perceived behavioral control	ERM	Non-ERM	0.78000	0.78718	0.613	-1.1670	2.272
		Engineering	-1.51905	0.82552	0.188	-3.5609	0.522
	Non-ERM	ERM	-0.78000	0.78717	0.613	-2.7270	1.167
		Engineering	-2.29905*	0.84320	0.027	-4.3846	-0.2134
	Engineering	ERM	1.51905	0.82552	0.188	-0.5228	3.560
		Non-ERM	2.29905*	0.84320	0.027	0.2134	4.384
Entrepreneurial intentions	ERM	Non-ERM	2.94909	1.13962	0.038	0.1301	5.768
		Engineering	-1.84701	1.20335	0.311	-4.8236	1.129
	Non-ERM	ERM	-2.94909*	1.13962	0.038	-5.7681	-0.1301
		Engineering	-4.79610*	1.22878	0.001	-7.8356	-1.7566
	Engineering	ERM	1.84701	1.20335	0.311	-1.1296	4.823
		Non-ERM	4.79610	1.22878	0.001	1.7566	7.835

Chapter 5. Summary, limitation and conclusions

5.1 Validity of the TPB

In this study, based on the TPB, the path analysis shows that Chinese university students' entrepreneurial intentions can be explained by the combination of personal attitude and perceived behavioral control. Subjective norm does not contribute significantly to the predication of entrepreneurial intentions of Chinese university students. Personal attitude is the main predictor of behavioral intentions, irrespective of students' educational background. Hence, a positive attitude towards start-up is a good starting point to stimulate entrepreneurial behavior.

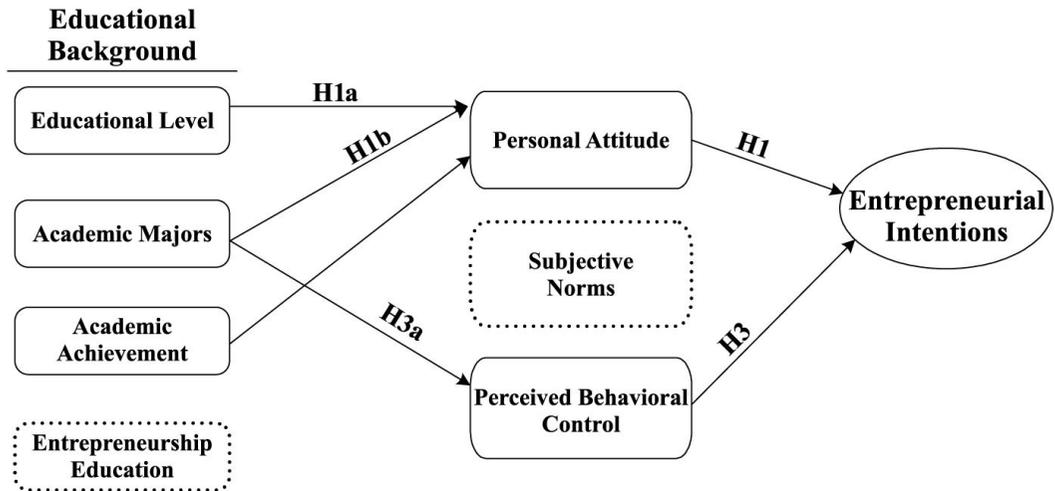
However, a positive attitude does not always result in entrepreneurial intention. This is due to the fact that perceived behavioral control also determines the decision-making process. Students who are more convinced that start-up is not a difficult task for them are more inclined to create a new venture.

5.2 Relationship between educational background and entrepreneurial intentions

Figure 3 illustrates findings in the present study. Educational level will influence entrepreneurial intentions through its effect on personal attitude. Entrepreneurship seems less attractive to students with postgraduate degree than those with diploma and undergraduate degree. There are two possible reasons for this phenomenon. First of all, diploma and undergraduate students are young and full of enthusiasm to begin their new venture; second, postgraduate students are facing high opportunity cost of time and stable cash flow demand.

【Figure3】 The relationship between educational background and

entrepreneurial intentions of Chinese university students



Academic major is an important factor to influence entrepreneurial intention identified in this study. Differences are found not only for attitudes but also for perceived behavioral control of students who differ in academic major. “Engineering” students have the highest tendency to start-up. And their scores for attitude as well as perceived behavioral control are higher than other groups. The findings are not identical to those reported from a study of Spanish university students, which the highest results are in “ERM” students. And “Non-ERM” group has the lowest inclination towards entrepreneurship. This may entail design of curriculums and courses to help “Non-ERM” students develop knowledge and skills required to start and run a business.

【Table X】.Means and standard deviations of the TPB components;

high versus low

	Academic achievement	N	Mean	Std.deviation	Std.error mean
Personal attitude	High	70	19.8571	4.29116	0.51289
	Low	79	17.3291	4.70875	0.52978
Subjective norm	High	70	8.3662	4.12740	0.48983
	Low	78	8.4103	3.33590	0.37772
Perceived behavioral control	High	71	14.4225	4.33149	0.51405
	Low	78	13.2179	3.77843	0.42782
Entrepreneurial intentions	High	71	23.5211	6.44506	0.76489
	Low	77	21.3896	5.72427	0.65234



**【Table XI】 . Independent samples test of the TPB components;
high versus low The impact of higher education**

		levene's test for equality of variances		t-test for equality of means			
		F	Sig	df	Sig. (two-tailed)	Mwan difference	Std.error difference
Personal attitude	eaual variances assumed	2.422	0.122	147	0.001	2.52803	0.74154
	eaual variances not assumed			146.877	0.001	2.52803	0.73737
Subjective norm	eaual variances assumed	7.450	0.007	147	0.943	-0.04406	0.61244
	eaual variances not assumed			134.700	0.943	-0.04406	0.61855
Perceived behavioral control	eaual variances assumed	0.119	0.731	147	0.072	1.20459	0.66451
	eaual variances not assumed			139.647	0.074	1.20459	0.66879
Entrepreneurial intentions	eaual variances assumed	0.311	0.578	146	0.035	2.13152	1.00045
	eaual variances not assumed			140.433	0.036	2.13152	1.00529



T-test failed to reveal a relationship between academic achievement and perceived behavioral control. The findings imply that students do not take academic achievement into account in their perception of behavioral control. Therefore, though academic achievement is often regarded as a judgment standard for university students' ability, entrepreneurship education should be available to all university students without discrimination on the grounds of academic achievement.

From the data we gathered, curriculum for entrepreneurship education of Centre China Normal University did not have significant impact on students' entrepreneurial related ideas. This is not similar to the result of Souitaris et al. (2007). The latter show that the programmes raise some attitudes and the overall entrepreneurial intention of students. Possible explanation about this result is: entrepreneurship education at Center China Normal University is still at the initial stage, it needs to be improved in terms of both motivating students and skills training.

There are several limitations in the study. The greatest challenge we see is in the data collection process since we only collected cross-sectional data. Longitudinal data will provide validity research support. Further, the findings hold specifically within the characteristics of the sample and the study region, i.e. university students at Center China Normal University, one of China's leading centers in research and education in Wuhan. Therefore, extrapolation to other university remains speculative. Finally, since there is no standardization of educational background in previous literature, future research could be oriented to redefine the variables that compose the educational background of the research.

Three important implications for higher education institutions and public policy arise from this study. First, Ajzen's TPB model can also be used to predict Chinese university students' entrepreneurial intentions. Second, educational background has impact on entrepreneurial intentions through antecedents of entrepreneurial intentions. Attitudinal factors, perceived behavioral control are different among Chinese university students with different educational backgrounds. Third, entrepreneurship education should pay attention to entrepreneurial skills as well as inspiring students' interest in entrepreneurship.

【Table XII】.Means and standard deviations of the TPB components; have entrepreneurship education versus do not have entrepreneurship education

	Entrepreneurship Education	N	Mean	Std. deviation	Std.error mean
Personal attitude	Yes	33	18.4848	5.16068	0.89836
	No	113	18.6867	4.58280	0.43111
Subject norm	Yes	33	9.0303	3.69531	0.64327
	No	114	8.2018	3.68489	0.34512
Preceived behavioral control	Yes	33	14.7576	3.50027	0.60932
	No	114	13.4561	4.20943	0.39425
Entrepreneurial intentions	Yes	33	24.6364	6.10747	1.06317
	No	113	21.7168	6.07905	0.57187



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