

A Binary Logistic Regression Model for Entrepreneurial Intention: A Case Study of Management Program at Pibulsongkram Rajabhat University

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Abstract

The objectives of this research were to test the entrepreneurial characteristics affecting the entrepreneurial intention of management students and predict their likelihood of entrepreneurial intention. The subjects were 264 students studying in the Faculty of Management Science, Pibulsongkram Rajabhat University. The data were collected online by using a questionnaire and analyzed by employing percentage, mean, standard deviation, and binary logistic regression analysis. The results revealed that risk taking significantly influenced the students' entrepreneurial intention at 0.05 level, and family background significantly affected their entrepreneurial intention at 0.01 level. However, innovativeness, internal locus of control and needs for achievement did not influence their entrepreneurial intention. The results of this research support the understanding of the phenomenon of entrepreneurial intention among management students and help policy creators to encourage and develop the future of young entrepreneurs of the program and the faculty. In addition, the logit model had an overall holdout accuracy rate of 78.40%.

Keyword : Innovativeness, Risk Taking, Internal Locus of Control, Needs for Achievement, Entrepreneurial Intention

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Introduction

Education is a tool for improving the quality of life of Thai people and increasing the social cost of the nation (Pimpa, 2018). One of the key roles of the Ministry of Higher Education, Science, Research and Innovation is laying the educational foundation of the country for the future of Thailand. The main focus is on developing the country's human capital to be capable and ready for life in the 21st century. Therefore, the government has a policy to bring science, research, and innovation to drive the country's economy. The Ministry of Higher Education, Science, Research and Innovation is a new ministry that merges Ministry of Science and Technology, Office of the Higher Education Commission, National Research Council of Thailand, and The Thailand Research Fund, and Pibulsongkram Rajabhat University is a higher education institution under Ministry of Higher Education, Science, Research and Innovation (Ministry of Higher Education, Science, Research and Innovation, 2022).

Pibulsongkram Rajabhat University policy focuses on being a university that emphasizes innovation and technology. Also, the university aims at creating graduates who are practitioners and creating technology for society, which is the vision of the organization. The mission of the university focuses on producing graduates with potential for careers in both the labor market and self-employed in the digital era. Management program of the Faculty of Management Science, Pibulsongkram Rajabhat University, is the program which produces graduates to meet the needs of the society, local community and labor market. Graduates must have potential and competencies that can be applied to pursue careers in government agencies, private sectors, and state enterprises. Management program emphasizes the application of management knowledge and business administration. Likewise, the field of management aims at developing students for business entrepreneurs that consistent with the curriculum objectives and university policy. The importance of entrepreneurship education has grown ever since entrepreneurs became one of the key drivers of business growth worldwide (Yildirim et al., 2019).

Entrepreneurship has become important for the growth of economies since last decade (Akhtar et al., 2020). Currently, many academics continue to study the needs for entrepreneurship among students studying business administration (Kong et al., 2020) because entrepreneurs are very important to drive the economy. Entrepreneurship is a factor that can

generate income and increase employment for the country (Astebro & Thompson, 2011). Entrepreneurial intentions are a comparatively new research area that has involved many entrepreneurship researchers and seen a quickly surge in several articles and studies (Jeger et al., 2014). Most researchers normally employed personality traits, risk taking propensity, needs for achievement and locus of control in entrepreneurial intention studies (Farrukh et al., 2018). The individuals who have more inclinations toward risk taking are more likely to manage uncertain condition such as forming a new entrepreneurial start-up (Zhao et al., 2005). In fact, Carland et al. (2007) argued that an entrepreneurial characteristic to predict intentions is risk taking propensity. Theory of McClelland (1961) indicated that need for achievement is a robust psychological driving force behind individual act. Also, it has been long proposed as a factor affecting entrepreneurial behavior. Internal locus of control plays a crucial role in decision to begin a new business enterprise (Entrialgo et al., 2000). Particularly, innovativeness is associated with entrepreneurship, so it is considered as one of the most vital key success factors for entrepreneurs and plays an important role in the entrepreneurial activity (Melati et al., 2018). Therefore, it is the origin of the study of entrepreneurial characteristics that influence entrepreneurial intention of management students in the Faculty of Management Science, Pibulsongkram University.

Research Objectives

1. To investigate entrepreneurial characteristics influencing entrepreneurial intention of management students of the Faculty of Management Science, Pibulsongkram Rajabhat University
2. To predict the likelihood of entrepreneurial intention of management students of the Faculty of Management Science, Pibulsongkram Rajabhat University

Research Framework

At this point, the associations among innovativeness, risk taking, internal locus of control, needs for achievement and entrepreneurial intention are verified. In this study, entrepreneurial characteristics are independent variables of the study, and entrepreneurial intention is a dependent variable of the research. Hence, the research relationships of these

variables are discussed and hypothesized. The conceptual framework shows the aforementioned relationships, as shown in Figure 1.

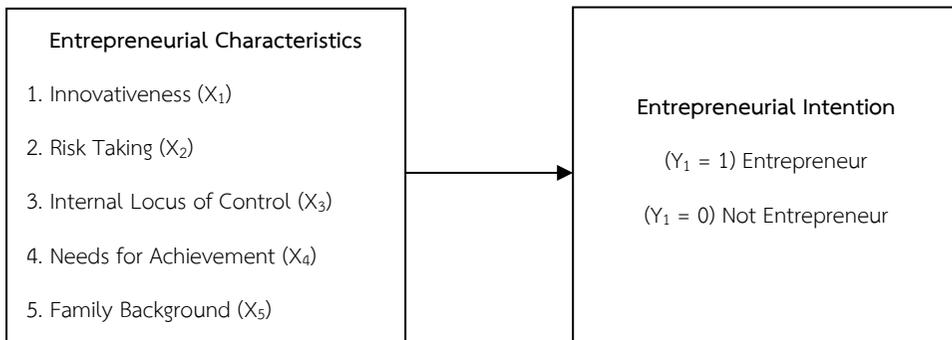


Figure 1. Conceptual Model by Binary Logistic Model

Literature Review

Entrepreneurial characteristics are the important behaviors of looking for opportunities to start a business and allocate resources efficiently and maximize benefits (Rashman et al., 2016). Therefore, in order for businesses to manage their organizations successfully, entrepreneurs should have these qualities as a driver for operating a business in a highly competitive environment to achieve business results. The characteristic approach is based on McClelland's (1961) psychological work on entrepreneurs. Thus, the psychological factors affected entrepreneurial intentions of people. Consistent with Frese (2009), innovativeness, risk taking, internal locus of control and needs for achievement are crucial personality traits. This research has divided the characteristics of entrepreneurship into four components: innovativeness, risk taking, internal locus of control and a need for achievement.

Innovativeness

Innovativeness, in this paper, can be defined as the ability of individual to create in operations, prefer work that use creativity and can apply technology with work. Innovativeness is associated with entrepreneurship, which is regarded as one of the most important success factors for entrepreneurs and plays an important role in entrepreneurial process (Melati et al., 2018). Zampetakis et al. (2011) stated that the more creative idea young people have, the

greater their entrepreneurial intentions are. Consequently, innovativeness is an antecedent of the social entrepreneurial intention involved in further research. From the aforementioned arguments on innovativeness, a first hypothesis can be proposed as:

H₁: Innovativeness has an influence on entrepreneurial intention.

Risk Taking

Risk taking, in this research, refers to the willingness of a person to engage in a business activity that cannot be predicted to be successful or not. Risk taking behavior is defined as one consciously or non-consciously controlled behavior with a perceived ambiguity about its result, and/or about its possible benefits or costs for the physical, economic, or psycho-social welfare of oneself or others (Trimpop, 1994). Koh (1996) proposed that the entrepreneurial function mainly requires risk assessment and risk taking. In addition, it demonstrates that person who has a tendency to take high risks has a stronger incentive to engage in entrepreneurship (Farrukh, 2018). Regarding to the previous review of empirical studies, it could be hypothesized that risk-taking behavior increases entrepreneurial intention. As a result, this research proposes the following hypothesis:

H₂: Risk taking has an influence on entrepreneurial intention.

Internal Locus of Control

Internal locus of control, in this paper, is defined as the belief that one can control things that occur in the business. Likewise, internal locus of control is concerned with entrepreneurs who have faith in their actions determined to achieve incentives (Karabulut, 2016). Locus of control is the level of control of an individual over their life. Furthermore, internal locus of control indicated that a person's belief controls their decisions in his/her life (Mueller & Thomas, 2001). Kristiansen & Indarti (2004) indicated that internal control is one of the most prevalent entrepreneurial characteristics. Also, when internal locus of control of a person is stronger, entrepreneurial intention is greater. It is assumed that the ones who have internal locus of control can establish their career paths, increase entrepreneurial intention, and begin their own businesses. Therefore, the aforementioned relationship can be hypothesized as below.

H₃: Internal locus of control has an influence on entrepreneurial intention.

A Need for Achievement

A need for achievement, in this research, can be defined as a person's desire to achieve entrepreneurial success with a determination to win. The need for achievement is believed to have the most common effect on entrepreneurial intentions because it increases the entrepreneurs to treat business activities effectively and successfully (Zeffane, 2013). Furthermore, Individuals who have superior needs for achievement are more motivated toward entrepreneurship than those who have fewer needs for achievement (Farrukh et al., 2018). At this point, in order to analyze the relationship of a need for achievement, the following hypothesis is proposed as:

H₄: A need for achievement has an influence on entrepreneurial intention.

In addition, several studies indicated that personality traits with demographic factors would influence a person's intention towards entrepreneurship (Hoe et al., 2012; Drennan et al., 2005). Based on a review of research and relevant literature, family background will be more likely to enhance the intentions to be an entrepreneur.

Family Background

An important variable for would-be entrepreneurs is the background of the family they come from. Their family is an initial social group for the prospective entrepreneur to learn the social and cultural patterns of a business (Vardhan & Biju, 2012). The family is the first society from which they can absorb the style of business management. Moreover, family background, which is involved as a part of the social background, has an impact on the entrepreneurial intention (Wathanakom et al., 2020). To summarize, the hypothesis is proposed as follows:

H₅: Family background has an influence on entrepreneurial intention.

Entrepreneurial Intention

This research defined entrepreneurial intention as a determined individual who wants to own his own business. Entrepreneurial intention is defined as person wishes to start a new venture or build new core value in existing organization (Remeikiene & Startiene, 2013). The intention to begin a venture or decision to become an entrepreneur has become a gradually interested phenomenon among business graduates worldwide (Urban, 2012).

Research Methodology

1. Population and Sample

The research embraced a quantitative method to empirical support for the hypothesis. The population in this research was considered of 463 management students of the Faculty of Management Science of Pibulsongkram Rajabhat University derived from student's database in 2021. The appropriate sample size was 215 students under the 95% confidentiality (Yamane, 1973). The data were collected from 264 management students through an online questionnaire, and 100 percent responses were received. The acceptable criterion for the sample size should fall between five and ten times the number of independent variables for regression analysis (Hair et al., 2010). Thus, 264 students are an acceptable sample size for employing binary logistic regression analysis.

2. Questionnaire

The hard-copied questionnaire utilized in this research was divided into three parts 1. basic information of targeted participants 2. Innovativeness (5 items), risk taking (4 items), internal locus of control (5 items) and needs for achievement (5 items), and (3) other suggestions. The items of questionnaire were developed from Farrukh et al. (2018), Law & Breznik, (2017) and Karabulut (2016).

3. Validity and Reliability Testing

The method demonstrated the test of appropriateness of the data gathering instrument and the credibility of the developed constructs; therefore, the tests of validity and reliability was considered. The method also described the statistical techniques that were utilized in the analysis. Likewise, three professionals in academic research were requested to review and suggest necessary recommendations to review the instrument to confirm that all constructs were sufficient to cover the contents of the variables. After the three academic experts designed the questionnaires, they were able to provide comments, improvements, and choose the best possible scale of measure complying with the conceptual definitions. This research employed a pre-test as a preliminary technique to support the improvement of the data collection instrument. The first thirty subjects who received surveys were selected to test the validity and reliability of the instrument. The researchers gave a pre-test to the

business administration program students who were not the students in the sample group. As suggested by Nunnally and Berstein (1994) and Streiner (2003), Cronbach's alpha coefficient is recommended so that its value should be equal or greater than 0.70 as widely accepted criterion. From Table 1, the findings of Cronbach's alpha coefficients are between 0.781 – 0.850 which exceeds the acceptable cut-off score.

Table 1. Cronbach's Alpha Coefficient

Variables	Cronbach's Alpha Coefficient
Independent Variables: Entrepreneurial Characteristics	
Innovativeness	0.835
Risk Taking	0.848
Internal Locus of Control	0.781
Needs for Achievement	0.850

4. Hypothesis Testing

The researchers tested the hypothesis that entrepreneurial characteristics have influence on entrepreneurial intention of management students of the Faculty of Management Science of Pibulsongkram Rajabhat University by binary logistic regression analysis. Logistic regression is a desired methodology by academics of social sciences due to its practical utility, less restrictive assumptions, and the purpose of probabilities for predictions (Hair et al., 2010).

Results

Out of the demographic characteristics of 264 respondents, approximately seventy-eight (78.40 percent) of the key participants were female. Most of them (73 students) were the fourth-year students, accounting 27.70 percent. Their families were non-entrepreneurs, representing sixty four percent. Likewise, most of the participants (34.50 percent) had monthly salaries of lower than 10,000 baht. After graduation, 77.30 per cent of them planned to become entrepreneurs.

Table 2. Descriptive Statistics and Correlation Matrix of Variables

Variables	X ₁	X ₂	X ₃	X ₄	X ₅	EI
Mean	4.10	4.01	4.13	4.23	n/a	n/a
S.D.	0.519	0.615	0.512	0.504	n/a	n/a
X ₁	1					
X ₂	0.624*	1				
X ₃	0.551*	0.552*	1			
X ₄	0.590*	0.497*	0.650*	1		
X ₅	0.076	0.082	-0.020	0.010	1	
EI	0.100	0.209*	0.170*	0.156*	0.237*	1

Note: * p < 0.05

Table 2 demonstrates the descriptive statistics and correlation matrix of all variables. There is no potential problem relating to multicollinearity because all correlation coefficients as values of -0.020 - 0.650 do not exceed 0.80 (Hair et al., 2010).

Table 3. Results of the Effects of Entrepreneurial Characteristics on its Consequence

Entrepreneurial Characteristics (Independent Variables)	Entrepreneurial Intention (Dependent Variable)		Wald	Sig	Odds Ratio
	B	S.E.			
	Constant	-3.677			
Innovativeness (X ₁)	-0.652	0.433	2.273	0.132	0.521
Risk Taking (X ₂)	0.834	0.334	6.227	0.013*	2.302
Internal Locus of Control (X ₃)	0.500	0.441	1.282	0.258	1.648
Needs for Achievement (X ₄)	0.444	0.428	1.077	0.299	1.559
Family Background (X ₅)	1.436	0.402	12.771	0.000**	4.206

-2LL: Based Model = 282.987, Proposed Model = 249.902 (X² = 33.084, df = 5, p = 0.000)

Cox & Snell R² = 0.118, Nagelkerke R² = 0.179, Percent Correct = 78.40%

Note: * p < 0.05 ** p < 0.01

Table 3 shows the results of the effects of entrepreneurial characteristics on entrepreneurial intention of management students in Management Science at Pibulsongkram Rajabhat University by binary logistic regression analysis. The results indicated that family background had a statistically significant effect on entrepreneurial intention at the 0.01 level.

Also, risk taking had a statistically significant effect on entrepreneurial intention at the 0.05 level. Family background showed the greatest impact for high entrepreneurial intention (the odds are 4.206 times greater with respect students whose families were not entrepreneur). A strong awareness of risk-taking increased the odds of a high entrepreneurial intention to 2.302. Innovativeness, internal locus of control and a need for achievement did not have a statistically significant effect on entrepreneurial intention.

After the goodness of fit in model was considered, the likelihood value (-2LL) and the Hosmer and Lemeshow Test statistics showed that the logistics regression equation was appropriate.

Table 4. Accuracy of the Prediction Equation

Observed	Predicted		Correct Percentage
	Entrepreneurial Intention		
	Entrepreneur	Not Entrepreneur	
Entrepreneur	7	53	11.70
Not Entrepreneur	4	200	98.00
Overall Percentage			78.40

Table 4 shows the efficiency of the logistics regression equation employed in this study. The equation was able to predict a group of graduated students to be entrepreneurs with 98% accuracy. Also, the equation was able to predict a group of graduate students who were not entrepreneurs with 11.70% accuracy. The model's accuracy was estimated based on the percentage of predicted accuracy of 78.40%.

Logistic regression equation analysis results: $\text{Logit}(Y) = -3.677 + 0.834X_2 + 1.436X_5$

Results and Discussion

The results of hypothesis testing in five items are discussed as follows:

1. Innovativeness

The research results showed that innovativeness did not influence the entrepreneurial intention. It is inconsistent with Wathanakom et al. (2020) who proposed that

innovativeness can effectively expect entrepreneurial intention with undergraduate students from public universities in Bangkok. Nevertheless, the critical characteristics of entrepreneurial intention were attitudes and self-efficacy, whilst innovativeness could be just a kind of skills, which is not the main factor for entrepreneurship (Law & Breznik, 2017). **Thus, Hypothesis 1 wasn't supported.**

2. Risk Taking

The research results indicated that risk taking influenced the entrepreneurial intention. This is in line with the finding of Douglas & Shepherd (2002) and Gurel et al. (2010) which proposed that the intention to be entrepreneurship is greater for those with more encouraging attitudes to risks and to autonomy. Also, Gurol & Atsan (2006) stated that entrepreneurship is previously related to risk taking. The student's risk tolerance has made it more likely to be an entrepreneurial intent. This is consistent with the study of Yurtkoru et al. (2014) which indicated that the higher the propensity to assess risk, the higher the entrepreneurial intention. Thus, risk taking had an effect on entrepreneurial intention. **Therefore, Hypothesis 2 was supported.**

3. Internal Locus of Control

The research results showed that internal locus of control did not influence entrepreneurial intention. The locus of control may be a critical factor in the degree of individuality employed in decision-making. Murthy et al. (2020) indicated that internal locus of control doesn't affect the decision making. Thus, the above could be assigned to social conditioning, education, and family background. **Hence, Hypothesis 3 wasn't supported.**

4. Needs for Achievement

The research results showed that a need for achievement did not influence entrepreneurial intention. This is in line with the finding of Koh (1996) which indicated that a needs for achievement and locus of control weren't significant at a 0.10 level of significance. Even though it may be entrepreneurial inclination, students can make better and more advised career choices. **Consequently, Hypothesis 4 wasn't supported.**

5. Family Background

The research results showed that family background influenced entrepreneurial intention. This is aligned with the findings of Chlost (2012) which suggested that the decision to become an entrepreneur positively correlates with the parental role models. The primary

socialization is parents who can encourage children to absorb entrepreneurship from parental role models (Kim et al., 2006; White et al., 2007). **Therefore, Hypothesis 5 was supported.**

Implications

Practical Implication

The results of this study reflect an understanding of the entrepreneurial characteristics of management students in the Faculty of Management Science at Pibulsongkram Rajabhat University. In addition, educational institutes with business administration programs can apply the results of their studies as a guideline for curriculum preparation or develop courses as follows:

1. Business administration program should focus on a teaching process that encourages students to be enterprising, such as investment and effective financial management.
2. Business administration programs should focus on teaching and learning that focuses on student problem-solving skills under a variety of situations.
3. Additionally, the results can be employed as a career guidance tool for students or as a device for screening students into business administration program.

Theoretical Implication

This study examined the influence of entrepreneurial characteristics on entrepreneurial intention, and revealed that entrepreneurial characteristics are the abilities that drive a successful business. In addition, this research has additional recommendations for the future research as follows:

1. Further research in the future should be accomplished to compare students in business administration programs in various educational institutions in neighboring provinces in the lower northern region.
2. In the next study, qualitative research can help to provide more in-depth information and expand new knowledge to develop the potential of students in the business administration program to have the characteristics of good entrepreneurs through effective teaching and learning processes that meet the requirements of the course.

Conclusion

Nowadays, education competition is higher, so educational institutions should adjust themselves. The objectives of this research were to test entrepreneurial characteristics that affect to entrepreneurial intention of management students and predict the likelihood of entrepreneurial intention of management students. The participants were 264 management students in the Faculty of Management Science, Pibulsongkram Rajabhat University. The data were collected through an online questionnaire and analyzed by using frequency, percentage, mean, standard deviation and binary logistic regression analysis. The results showed that risk taking had influence on entrepreneurial intention, and student's parents who are entrepreneurs had influence on entrepreneurial intention. Risk taking is an important characteristic of entrepreneurs since they encounter with risks more than other people. Individuals who endure risks will have more entrepreneurial intentions. Entrepreneurial course should teach to take calculated risks and manage risks before they graduate. However, innovativeness, Internal locus of control and a need for achievement did not influence entrepreneurial intention. The logit model had an overall holdout accuracy rate of 78.40%. Research on entrepreneurship education can develop quality Management programs by designing suitable education tactics.

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