Global Conference on Business and Economics Research (GCBER) 2017
14-15August 2017, Universiti Putra Malaysia, Malaysia

Explaining the Relationship between Entrepreneurial Learning and Entrepreneurial Ability through Knowledge Management Perspective among Undergraduate Students Base on SEM-PLS

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Abstract

How to improve the entrepreneurial ability of undergraduate students is an important issue that needs to be solved at present. From the perspective of knowledge management, this paper attempts to reveal the mechanism of transforming undergraduate students' entrepreneurial learning ability into entrepreneurial competence, and test the mediating and moderating theoretical model of the relationship between entrepreneurial learning, knowledge management, entrepreneurial atmosphere and entrepreneurial competence. Using Smart-PLS software, 182 questionnaires were analyzed; the results show that in terms of the relationship between entrepreneurial learning and entrepreneurial competence, undergraduate students' knowledge management play a mediator role, the entrepreneurial atmosphere of universities play a moderator role.

Keywords: Entrepreneurial learning, knowledge management, entrepreneurial climate, entrepreneurial ability

1.   INTRODUCTION

The Chinese State Council clearly pointed out that innovation is an effective way to stimulate the creativity of the whole society and the potential of entrepreneurial activity. Under this situation, the study of undergraduate students' entrepreneurship has become more and more positive. Statistics show that undergraduate students' entrepreneurial activities are more active, but the success rate is low, the entrepreneurial ability of undergraduate students is obviously insufficient. So, it is an important research issue to improve the entrepreneurial competence of undergraduate students.

As we know, learning is one of the important ways to enhance the ability. At present, the domestic and foreign scholars have not explicitly put forward the explicit relationship between them. On the basis of literature review, this paper introduces knowledge management as the mediating variable and the entrepreneurial atmosphere of colleges and universities as the moderating variables to explore the relationship between entrepreneurial learning and entrepreneurial ability of undergraduate students.

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2.   LITERATURE REVIEW AND RESEARCH HYPOTHESES
2.1   Entrepreneurial Learning and Entrepreneurial Ability

Rae and Carswell (2001) found that knowledge and experience gained from learning from other entrepreneurs' entrepreneurial insights or entrepreneurial practices can enable entrepreneurs to better manage their businesses; Mitra and Matlay (2004) argued that most entrepreneurial skills and necessary knowledge need to be obtained through higher education or vocational education training courses; Arikan and McGahan (2010) suggested that entrepreneurial learning encourages entrepreneurs to build unique competencies that allow them to better identify and exploit opportunities in uncertain environments;Cai et al. (2014) demonstrated the predictive role of entrepreneurial learning and entrepreneurial capacity through empirical research; Xie et al. (2016) showed that learning facilitates the expansion of entrepreneurial capacity. Accordingly, hypothesis H1: undergraduate students' entrepreneurial learning has a positive impact on their entrepreneurial ability.

2.2   Entrepreneurial Learning Ability and Knowledge Management

Currie and Kerrin (2003) showed that there is a positive relationship between organizational learning and knowledge management. Lin xunLiang (2011) believed that organizational learning and knowledge management is accompanied, the process of organizational learning is related with knowledge management. Wu et al. (2004) pointed out that knowledge management and organizational learning are two complementary processes. In the process of organizational learning, knowledge gained by learning can only be effectively transformed into enterprise performance through knowledge management. The process of knowledge management is cannot do without organizational learning. Gnyawali and Stewart (2003) further argued that organizational learning consolidates existing knowledge and promotes sharing of knowledge throughout the organization. Accordingly, hypothesis H2: undergraduate students' entrepreneurial learning has an positive impact on their knowledge management;

2.3   Knowledge Management and Entrepreneurial Ability

According to the theory of dynamic capability and organizational learning, knowledge integration and knowledge innovation can help to form dynamic capability (Zollo and Winter, 2002). The integration of entrepreneurial knowledge assists start-ups in integrating acquired knowledge, skills and patents which determine the depth and scope of entrepreneurial capabilities (Grant, 1996; Teece, 1997; Zahra, 1999). Knowledge integration, knowledge innovation, etc., as an important content of knowledge management, and entrepreneurial ability can be seen as a unique dynamic capacity , its construction and upgrading is inextricably linked with entrepreneurial knowledge management. Accordingly, hypothesis H3: undergraduate students' knowledge management has a positive impact on their entrepreneurial capacity.

2.4   The Mediator Role of Knowledge Management

Scholars have not yet made it clear whether there is a positive relationship between entrepreneurial learning ability and entrepreneurial ability. XieHongming et al (2007) showed that there is a significant relationship between learning and knowledge integration, learning through knowledge integration to promote management innovation and technological innovation. Anderson (1982) points out that entrepreneurial learning is to enrich the entrepreneurial knowledge and improve entrepreneurial skill through the previous experience and imitation of others' behavior in the entrepreneurial process. Knowledge acquisition, knowledge integration, knowledge sharing and knowledge application are the important contents of knowledge management. Therefore, this paper introduces knowledge management as a mediating variable to demonstrate the relationship between entrepreneurial learning and entrepreneurial ability. Specifically, hypothesis H4: knowledge management plays a mediator role in the relationship between entrepreneurial learning and entrepreneurial ability.

2.5   The Moderating Effect of Entrepreneurial Atmosphere in Colleges and Universities

Organizational entrepreneurial climate is born out of the concept of organizational climate and entrepreneurial theory, and is the organizational members' overall perception of entrepreneurial characteristics. As a useful attempt to study entrepreneurship from the perspective of social cognition, this paper attempts to study the function of entrepreneurial atmosphere in Colleges and Universities. Li Jianhua (2007) believes that the organizational climate is the perception of individual members to the organizational environment, including the influence of environment on individuals. Thus, from the general definition of the organizational climate, we can deduce the entrepreneurial atmosphere is the overall perception of the entrepreneurial environment. Bandura believes that environment affects the individual's perception and choice. Therefore, the author suggests that entrepreneurial

atmosphere affects entrepreneurial learning and knowledge management. Accordingly, hypothesis H5: entrepreneurial atmosphere play a moderator role in the relationship between knowledge management and entrepreneurial ability.

3. DATA AND VARIABLES
3.1 Sample Selection and Data Collection

The respondents of this study are students who work in university entrepreneurship centers, entrepreneurship associations, college students Incubation Park and other organizations. The data of this study were collected by on-site investigation and questionnaire platform. A total of 300 questionnaires were sent out and 182 valid questionnaires were retrieved. The effective rate of the questionnaires was 55%. The questionnaires were collected from the universities of Beijing, Tianjin and Hebei.

3.2 Variable Measurement
Entrepreneurial learning

The college students' entrepreneurial learning scale drawn on Zhao Yingzhen's (2015) College students' entrepreneurial learning model, including two dimensions (knowledge storage and practical application), 18 questions. Likert five-point scoring method was used, in which 1 means that the degree of compliance is very small, 2 means that the degree of compliance is small, 3 that the degree of compliance medium, 4 that a greater degree of compliance, 5 said that a large degree of compliance.

Knowledge management

The knowledge management scale for college students is mainly based on the achievements of Dong Xiaoying et al. (2006), Shi Wengeng et al. (2012), Li Donghui (2013) and GuYizhen (2016). The knowledge management ability of college students is divided into three dimensions, including knowledge acquisition, integration and application. The Likert five-point scale was used in the questionnaire. 1 means that the degree of compliance is very small, 2 means that the degree of compliance is small, 3 that the degree of compliance medium, 4 that a greater degree of compliance, 5 said that a large degree of compliance.

Entrepreneurial atmosphere in colleges and universities

In view of the current lack of a mature college entrepreneurial atmosphere scale for reference, this study intends to use induction method to build the content of entrepreneurial atmosphere dimensions, and on this basis, establish the college atmosphere survey questionnaire. Likert five-point scale was used, respectively, very dissatisfied, dissatisfied, general, satisfied and very satisfied, given 1 to 5 points.

Entrepreneurial ability

The questionnaire of the college students entrepreneurial ability is based on the questionnaire which was compiled by Gao Guijuan et al (2013). A total of three dimensions (professional competence, methodological competence, social capacity. Likert five-point scoring method was used.

4. RESULT
4.1 Measurement Model

The first step is assessment of construct reliability and convergent validity of first order reflective-item model, the measurement model should be assessed prior to conducting structural model analysis. In Table 1, the results of loadings, Average Variance Extracted (AVE) and Composite Reliability (CR) measures of all items for first order constructs are reported. The measurement would be acceptable if the AVE for each construct is greater than 0.50 (Nunnally& Bernstein, 1994) and CR is greater than 0.80 (Chin, 2010). In this case, all items are loaded highly on their own latent variable, and thus all measurements have satisfactory levels of reliability.

Table 1. Measurement model of first-order constructs

Construct	Items	Factor Loading	AVE	CR	Cronbach's Alpha value	Convergent Validity (AVE > 0.5)
Knowledge Storage	KS1	0.890	0.79	0.92	0.87	Yes
	KS2	0.902				
	KS3	0.890				
Practical Application	PA1	0.857	0.72	0.88	0.81	Yes
	PA2	0.860				
	PA3	0.840				
Knowledge Acquisition	KA1	0.794	0.62	0.86	0.79	Yes
	KA2	0.657				
	KA3	0.812				
	KA4	0.859				
Knowledge Integration	KI1	0.870	0.80	0.95	0.94	Yes
	KI2	0.916				
	KI3	0.902				
	KI4	0.912				
	KI5	0.893				
Knowledge Application	KP1	0.870	0.80	0.95	0.94	Yes
	PK2	0.794				
	KP3	0.657				
	KP4	0.812				
Professional Competence	PC1	0.926	0.81	0.93	0.91	Yes
	PC2	0.912				
	PC3	0.902				
Methodological Competence	MC1	0.893				
	MC2	0.928	0.84	0.94	0.91	Yes
	MC3	0.894				
	MC4	0.841				
	MC5	0.824				
Social Capacity	SC1	0.897	0.81	0.94	0.92	Yes
	SC2	0.899				
	SC3	0.904				
	SC4	0.912				

Criteria: Composite Reliability > 0.708 (Hair et al; 2010), (Hair et al; 2014); AVE > 0.5 (Hair et al; 2010), (Hair et al; 2014); Cronbach's Alpha value > 0.70 (Nunnally, 1978)

For second order constructs, Table 2 shows that the VIF values for Entrepreneurial learning, knowledge management and entrepreneurial ability are all below the threshold of 3.33 (Diamantopoulos &Siguaw, 2006). The results therefore did not indicate a multicollinearity problem. As show in Table 4.3, the analysis of discriminate validity shows a reasonably higher loading of each item on its intended construct than on any other constructs.

Table 2. Measurement model of second level formative constructs

Construct	Dimension	Weights	t- value	VIF
Entrepreneurial	Knowledge Storage	0.37	25.78**	1.83
Learning	Practical Application	0.38	22.77**	1.69
Knowledge	Knowledge Acquisition	0.43	21.29**	1.53
Management	Knowledge Integration	0.33	20.53**	1.65
	Knowledge Application	0.32	24.72**	1.66
Entrepreneurial Ability	Professional Competence	0.17	12.76**	1.34
	Methodological Competence	0.37	33.74**	2.09
	Social Capacity	0.31	28.53**	1.89

Note: **$p<0.01$. VIF<3.33

Discriminant validity analysis is conducted to ensure that individual first order constructs are truly distinct from each other.In the context of this study, discriminant analysis was conducted to determine that the first order constructs of Entrepreneurial learning, knowledge management and entrepreneurial ability were distinctly different from each other empirically, providing support that conceptually and theoretically it was obvious that they have been defined differently.Table3 depicts the assessment of the discriminant validity of first-order constructs using the Fornell and Larcker criterion. Therefore, it is confirmed that no multicollinearity exists among the constructs (Bock, Zmud, Kim, & Lee, 2005; Neter, Kutner, Nachtsheim, & Wasserman, 1996).

Table 3. Discriminate validity of first-order constructs

	1	2	3	4	5	6	7	8
1 Knowledge Storage	0.89							
2 Practical Application	0.50	0.78						
3 Knowledge Acquisition	0.60	0.55	0.85					
4 Knowledge Integration	0.23	0.39	0.37	0.92				
5 Knowledge Application	0.37	0.52	0.50	0.31	0.90			
6 Professional Competence	0.34	0.51	0.49	0.40	0.61	0.85		
7 Methodological Competence	0.32	0.40	0.35	0.39	0.52	0.51	0.83	
8 Social Capacity	0.29	0.35	0.49	0.40	0.51	0.55	0.63	0.89

Note: HTMT $_{0.90}$.

4.2 Structural Model

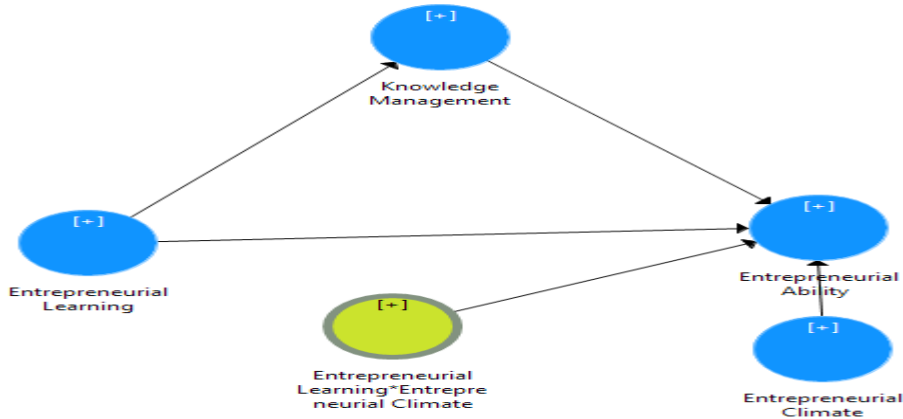Fig1. The structural model

The structural model is presented in Figure 1.In order to assess the structural model, Hair, Hult, Ringle, and Sarstedt (2016) proposed a five-step procedure in assessing the structural model utilized in this study, namely assess structural model for collinearity issues, assess the R^2, assess the effect size f^2, assess the predictive relevance Q^2, and assess path coefficients.

Table 4. Collinearity assessment (VIF)

	1	2	3
1 Entrepreneurial Learning			
2 Knowledge Management	1.78		
3 Entrepreneurial Ability	1.93	1	

Note: VIF<5

Table 4 presents the outcome of the lateral collinearity test. The VIF score for each individual construct is lower than the offending value of 5 as suggested by Hair et al. (2016), thus, suggesting that there were no collinearity issues.

Table 5. The Determination of co-efficient (R^2)

Construct	Co-efficient of Determination R^2	Magnitude
Entrepreneurial Ability	0.79	Substantial
Knowledge Management	0.25	Substantial

Criteria: For R^2 score interpretation, Cohen (1988) suggests the following: 0.26 – Substantial, 0.13 – Moderate and 0.02– Weak.

Table 5 illustrates the R^2 value for both endogenous constructs of knowledge management and entrepreneurial ability. The R^2 value of 0.25 for knowledge management indicates that entrepreneurial learning explains 25% of the variance in knowledge management. Similarly, the R^2 value of 0.79 for entrepreneurial ability suggests that entrepreneurial learning and knowledge management explain 79% of the variance in entrepreneurial ability. According to Cohen (1988), the R^2 value of 0.26, 0.13 and 0.02 as a rule of thumb, can be described as substantial, moderate and weak. Hence, we can postulate that the strength of the relationship between entrepreneurial learning and knowledge management is moderate (Cohen, 1988). Similarly, we also can conclude that the strength of the relationship between entrepreneurial learning and knowledge management on entrepreneurial ability is quite substantial (Cohen, 1988).

Table 6. Assessing effect size (f^2)

Relationship	Effect size (f^2)	Magnitude
Entrepreneurial Learning -> Knowledge Management	0.28	Medium
Knowledge Management ->Entrepreneurial Ability	0.75	Large
Entrepreneurial Learning ->Entrepreneurial Ability	0.18	Small

Criteria: For interpretation of effect size f^2, Cohen (1988) suggests the following: 0.02 – Small effect size, 0.15 – Medium effect size, 0.35 – Large effect size.

According to Cohen (1988) and Chin (1998), the f^2 value of 0.35, 0.15 and 0.02 as a rule of thumb, can be described as large effect size, medium effect size and small effect size. As illustrated in Table 6, entrepreneurial learning (0.28) have medium to large effect sizes on knowledge management. On the other hand, when entrepreneurial ability is used as the endogenous variable, entrepreneurial learning (0.18) have small to medium effect size on entrepreneurial ability while knowledge management (0.75) has a large effect size on entrepreneurial ability. These results show that knowledge management is important in explaining entrepreneurial ability. The exclusion of this construct from the model will result in a drastic change in the amount of variance explained (R^2) of entrepreneurial ability.

Table 7. Assessing predictive relevance (Q^2)

Construct	Q^2	Relevance
Entrepreneurial Ability	0.39	Yes
Knowledge Management	0.19	Yes

Criterion: Hair et al., (2016) suggest the following: value larger than 0 indicates that the exogenous construct have predictive relevance over endogenous constructs.

Table 7 shows that the Q^2 value of 0.39for entrepreneurial ability, which is larger than 0, is an indication that entrepreneurial learning and knowledge management are capable of predicting entrepreneurial ability. Similarly, the Q^2 value of 0.19 for knowledge management, which is larger than 0, suggest that entrepreneurial learning is capable of predicting knowledge management.

The results of hypothesis testing by determining the significance levels of path coefficients are summarized in Table 8.

Table 8. Results of hypothesis testing

Hypothesis	Relation	Path co-efficient (β)	T-Value	P-Values	Results
H1	Entrepreneurial Learning ->Entrepreneurial Ability	0.27	3.63	0	Supported[**]
H2	Entrepreneurial Learning -> Knowledge Management	0.34	9.13	0	Supported[**]
H3	Knowledge Management -> Entrepreneurial Ability	0.22	4.56	0	Supported[**]
H4	Entrepreneurial Learning -> Knowledge Management ->Entrepreneurial Ability	0.21	8.53	0	Supported[**]
H5	Entrepreneurial Learning*Entrepreneurial Atmosphere ->Entrepreneurial Ability	-0.01	0.30	0.75	Not Supported

Note: **p< 0.01

Specifically, strong and statistically significant evidence was found in support of hypothesis H1 (Entrepreneurial Learning -> Knowledge Management, β= 0.27, p<0.01). Similarly, statistically significant support is found for H2 (Entrepreneurial Learning -> Knowledge Management, β= 0.34, p<0.01) and H3 (Knowledge Management -> Entrepreneurial Ability, β= 0.22, p<0.01). H4 (Entrepreneurial Learning -> Knowledge Management -> Entrepreneurial Ability, β= 0.21, p<0.01), the findings suggest that students have higher entrepreneurial learning ability impacts positively on their knowledge management ability which results in goodwill which in turns enhances their entrepreneurial ability. However, H5 (Entrepreneurial Learning * Entrepreneurial Atmosphere -> Entrepreneurial Ability) is not supported since β= -0.01 and P>0.05.

5. CONCLUSIONS AND SUGGESTIONS

This study explored the mechanism of transforming college students' entrepreneurial learning into entrepreneurial competence, and tested the theoretical model of the relationship between entrepreneurial learning, knowledge management, entrepreneurial climate and college students' entrepreneurial competence. And 182 questionnaires were used to carry out the empirical analysis, which verified the hypothesis that college students' entrepreneurial learning ability has an positive impact on entrepreneurial ability; knowledge management has an positive impact on entrepreneurial capacity; college students entrepreneurial learning has an positive impact on knowledge management; knowledge management play a mediator role in the relationship between entrepreneurial learning

and entrepreneurial ability; entrepreneurial atmosphere play a moderator role in the relationship between knowledge management and entrepreneurial ability; Combined with the conclusion, this paper gives the following suggestions:

It is found that entrepreneurial learning has positive effects on entrepreneurial ability, so it is helpful to enhance the entrepreneurial ability of college students. College students in entrepreneurial organizations should actively use a variety of knowledge platform to acquire and store knowledge and experience, and apply it to practice.

The research proved that the knowledge management can improve the entrepreneurial ability; therefore we must pay attention to the knowledge management. Knowledge plays an increasingly important role, in the face of huge information and knowledge, we must learn the scientific management knowledge, enhance the capabilities of knowledge management, thereby enhancing the entrepreneurial ability.

The study found that entrepreneurial climate has a moderating effect on the relationship between knowledge management and entrepreneurial ability. Therefore, colleges and universities should pay attention to creating a favorable atmosphere for entrepreneurship. By strengthening innovation and entrepreneurship courses, implementing the responsibilities of entrepreneurship service agencies, and carrying out the research and academic about entrepreneurship, we can create a good entrepreneurial climate.

6. CONTRIBUTION AND LIMITATIONS

The contribution of this paper is to test the relationship between entrepreneurial learning, knowledge management, entrepreneurial climate and entrepreneurial ability from Chinese economic and cultural background, and puts forward corresponding theoretical models to enrich the research on entrepreneurship. The limitation is that the entrepreneurial climate scale only developed by induction method, lacked of consultation with relevant expert and organization, may cause the lack of generalization. Second, the respondents for the questionnaire survey are limited.

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