

A Research on the Indicators Construction and Application for
Entrepreneurship Education in Higher Education
—A Case Study on Taiwan U-start Innovation and Entrepreneurship Plan

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Abstract

This study aims to construct the indicators of entrepreneurship education in higher education and to explore such applications. First, the meaning of entrepreneurship education is explained through the exploration and analysis of domestic and international literature. The aspects and indicators of entrepreneurship education in higher education was initially drafted and suitability assessment was conducted by entrepreneurship education-related scholars, experts, government authorities, and business representatives. The indicators of entrepreneurship education in higher education were constructed based on the experts' opinions that were integrated via the Fuzzy Delphi Method. Then, the Importance-Performance Analysis was used to explore the importance and performance level of the indicators of entrepreneurship education in higher education for the 261 enterprises that received the subsidies from U-Start Plan for Innovation and Entrepreneurship and that are still operating by youth.

According to the analysis and results of the research, the main conclusions are summarized as follow:

- I. The indicators of entrepreneurship education in higher education include four aspects of sixteen indicators: “cultivation of entrepreneurial attitudes”, “learning of entrepreneurial capacities”, “cultivation of social competences”, and “incubation assistances”.
- II. “Cultivation of entrepreneurial attitudes” and “incubation assistances” among the indicators of entrepreneurship education in higher education are the key aspects.

III. “Cultivation of social competences” and “learning of entrepreneurial capacities” among the indicators of entrepreneurship education in higher education have poor cognition which should be prioritized for improvement.

IV. According to Importance-Performance Analysis, four indicators of entrepreneurship education in higher education should be prioritized for improvement.

V. Women believed the “cultivation of social competences” was more important. Entrepreneurial enterprises of 6-10 years believed “incubation assistances” to be more important.

VI. Entrepreneurial enterprises of 6-10 years had better cognition in the aspect of "cultivation of social competences ", whereas enterprises with seven or more employees and with annual revenue of more than \$333,334 had better cognition in the aspect of “cultivation of social competences” and “incubation assistances”.

Keywords: Higher-education, Entrepreneurship education, Fuzzy Delphi Method, Importance-Performance Analysis

1. Introduction

As the economic problems and employment issues are gradually appearing due to the unstable global economy, Entrepreneurship has already become a new choice for people changing their lives in the aim of improving national competitiveness and employment opportunities. The Global Entrepreneurship Monitor (GEM, 2014) adopts the National Expert Survey, and nine major Entrepreneurial Framework Conditions (EFCs) are evaluated by 36 experts from all over the world, of which experts from various countries believe that the inadequate entrepreneurship education and the obvious entrepreneurship education problems as well as challenges have already become the focus of the international entrepreneurship discussion.

The campus is regarded as the key place to promote entrepreneurship development and create innovative atmosphere. As the Ministry of Education, Ministry of Economic Affairs and other government departments are promoting various entrepreneurship programs, colleges and universities in Taiwan are also gradually attaching importance to the entrepreneurship education and including entrepreneurship courses into school courses or formal courses. In 2019, the Ministry of Education formulated College Graduates Entrepreneurship Service Plan to enable students to develop careers successfully, minimize the impact of the economic crisis, and enhance the overall competitiveness of the country, which was renamed as "U-start Plan for Innovation and Entrepreneurship" (Youth Development Administration, Ministry of Education, 2018).

According to the above research motivations, the research objectives of this study are as follows:

- (1) Build indicators for Entrepreneurship Education (hereinafter referred as EE) in Higher Education Institutions (hereinafter referred as HEIs)
- (2) Analyze the importance and performance of indicators for EE in HEIs
- (3) Understand the differences between the importance and performance of EE indicators in HEIs under the different background variables of enterprises that are subsidized by the U-start Plan for Innovation and Entrepreneurship.
- (4) Understand the distribution of the importance and performance of EE indicators in HEIs

2. Literature Review

2.1 Connotation of EE

Winkel, Vanevenhoven, Drago and Clements (2013) found that many HEIs around the world support programs that provide students technology, knowledge, capabilities, and opportunities for becoming successful entrepreneurs or SME managers. Hytti and

Kuopusjärvi (2004) believed that EE could help students understand entrepreneurship, acquire relevant entrepreneurial knowledge as well as skills and then ready to become an entrepreneur. Holmgren et al. (2004) found that EE can encourage more students to join the team of entrepreneurship.

As can be seen from the above explorations, EE refers to the entrepreneurship-related courses that the school has set up to provide students with entrepreneurial skills, knowledge, abilities and opportunities, which can give students chances to combine their learned expertise with creativity and verify their entrepreneurial practices in the market, help students cultivate independent thinking personality and give play to entrepreneurship spirit, enable students to innovate or expand their talents in social and economic perspectives, and create economic and social value.

2.2 The current EE situation in the world's advanced countries

This paper summarizes and concludes the characteristics of EE in HEIs in advanced countries such as the United States, Finland, Israel, Singapore, Japan and South Korea as follows (Li Yanyi, Yang Minling, Li Zhenghan, 2016; Huang Yuechun, 2015; Yang Jingzhu, 2013; Tan Hao, 2017; European Commission Research and Innovation Observatory, 2014):

(1) Finding potential entrepreneurial teams through entrepreneurship courses or competitions

Potential teams are evaluated through university and college courses or competitions, they could get suggestions to modify their business models or entrepreneurial directions, and develop new products or create company funds.

(2) Attaching importance to the teaching model of combining courses with practices

The first priority of EE is to combine courses with practices. In addition to coordinating company visits and student internships, the courses are also combined with practices, in which students are required of “learning by doing” to deepen their entrepreneurial knowledge, including all kinds of business plans and investment competitions. Besides, professionals supporting and training opportunities are provided to help students set up businesses.

(3) Focus on the international integration and talents recruitment and training

Universities are equipped with teachers and talents that have international perspectives, entrepreneurial practices and multinational companies experience, including professors, entrepreneurs and entrepreneurship investors. Universities encourage students to participate in international entrepreneurship competitions and even intern in international enterprises to integrate with the world.

2.3 The EE promoting status in Taiwan

In order to associate with the Sustainable Development Goals (SDGs) proposed by the UN, Executive Yuan in Taiwan integrates the entrepreneurial energy and resources in governments, society and U.S. Silicon Valley. The Taiwan Innovation and Entrepreneurship Policy was established on December 31, 2014, which reported youth entrepreneurship projects, social enterprise action plans and social innovation action plans, and promoted social innovation and youth entrepreneurship business through the resource integration of various departments conducted by the Ministry of Economic Affairs (Taiwan Executive Yuan, 2014、2018; Youth Development Administration, Ministry of Education, 2014).

The Ministry of Education, Ministry of Economic Affairs and Ministry of Science and Technology promoted the entrepreneurship plans such as EC-SOS as well as SOS-IPO, and encouraged HEIs to promote innovation and entrepreneurship, set up Incubation Center as well as Innovation and Entrepreneurship Incentive Plans. Students are also encouraged to participate in relevant competitions and company visits, achieving their entrepreneurship dreams under the assistance and guidance of teachers, professionals as well as the incubation center (Ministry of Science and Technology, 2019; Ministry of Education, 2014, 2016, 2017, 2018; SME Administration, Ministry of Economic Affairs, 2019).

The Youth Development Administration, Ministry of Education promoted the U-start Plan for Innovation and Entrepreneurship in combination with the school incubation assistance resources. In the first phrase, college graduates, students in the school, foreigners and the school incubation center in the recent 5 academic years could apply for it with an entrepreneurship subsidy of NT\$500,000. In the second phrase, entrepreneurship teams with good performance could get entrepreneurship subsidies of NT\$250,000 to NT\$1,000,000, and acquire the assistance of the school incubation center for one year (Youth Development Administration, the Ministry of Education, 2017). From 2009 to 2018, 814 items were subsidized, 546 enterprises were set up, 216 of which are still in operating. The U-start Plan for Innovation and Entrepreneurship has promoted the stable development of entrepreneurship culture and atmosphere in campus (Youth Development Administration, Ministry of Education, 2018).

2.4 Related research and preliminary creation of EE indicators

Nasr and Boujelbene (2014) evaluated the impact of EE through the five perspectives in entrepreneurial attitudes, entrepreneurial project approach, entrepreneurial ability, communication and relationship skills, and having a good reputation:

- (1) Entrepreneurial Attitudes: a. seeking independence and freedom; b. being willing to organize and use resources; c. creating and handling unexpected situations; d. having efficiency in entrepreneurship; e. applying the achievements learned at school.
- (2) Entrepreneurial Project Approach: a. entrepreneurship motivation; b. looking for adventuresome and challengeable programs; c. starting and achieving the motivation of programs; d. seeking ideas and market information; e. the feeling of fully participating in the program operating; f. the program is developing internationally.
- (3) Entrepreneurial Ability: a. people around are supporting entrepreneurial behavior; b. perseverance and determination.
- (4) Communication and Relationship Skills: a. integrating working fields into the society; b. interpersonal and communication skills; c. learning cooperation and having team spirits; d. appropriately presenting and integrating into the environment.
- (5) Having a Good Reputation: a. being recognized and having a good reputation in the working fields; b. looking forward to becoming professionals.

Grace and Omar (2012) conducted a survey of EE indicators and entrepreneurial efficiency among 500 American entrepreneurs, and found that the following indicators are helpful in improving entrepreneurial efficiency:

- (1) Education and Managerial Skills: a. finance, marketing and interpersonal relationship training; b. working experience; c. learning majors; d. technical knowledge.
- (2) Social Competence and Interpersonal Skills: a. customer relationship; b. employee relationship; c. effective communication skills; d. social adaptability; e. good reputation; f. families and friends supporting.
- (3) Training Skills: a. innovation; b. energy; c. available market developing opportunities; d. business planning; e. strategic partners.
- (4) Access to Capital: a. obtaining resources; b. getting loans; c. investors/venture capital investment.

OECD (2009) conducted a research on EE indicators, and found that the following indicators are helpful in encouraging students to join in entrepreneurship:

- (1) Entrepreneurship Attitudes and Mindsets: a. confidence; b. self-motivation; c. taking risks; d. improving working satisfaction.
- (2) Entrepreneurship Competence : a. the ability of converting school-learned knowledge to entrepreneurship; b. enterprise management skills; c. work teams; d. market situation.

This study draws on the research of government departments and scholars such as SME Administration of Ministry of Economic Affairs, Fayolle et al., Grace and Omar, OECD as well as Nasr and Boujelbene, and initially creates sixteen EE indicators in HEIs as shown in Table 1 according to four perspectives: Cultivation of Entrepreneurial Attitudes / A; Learning of Entrepreneurial Capacities / C; Cultivation of Social

Competences / S; and Incubation Assistancess / I (SME Administration of Ministry of Economic Affairs, 2000; Fayolle et al, 2006; Grace & Omar, 2012; OECD, 2009; Nasr & Boujelbene, 2014).

3. Research design and implementation

This paper aims to create EE indicators and applications in HEIs, and mainly adopts the Fuzzy Delphi Method and Importance-Performance Analysis (IPA) as major analyzing methods. Firstly, this paper discusses the domestic and foreign relevant literatures, and initially creates EE indicators in HEIs for experts to assess the fitness. Secondly, this paper integrates experts' opinions through the Fuzzy Delphi Method to create EE indicators in HEIs, and through Importance-Performance Analysis, explores the cognition of EE indicators in HEIs of 216 enterprises that are subsidized by U-start Plan for Innovation and Entrepreneurship and still operating. The summary diagram of the research is shown in Figure 1:

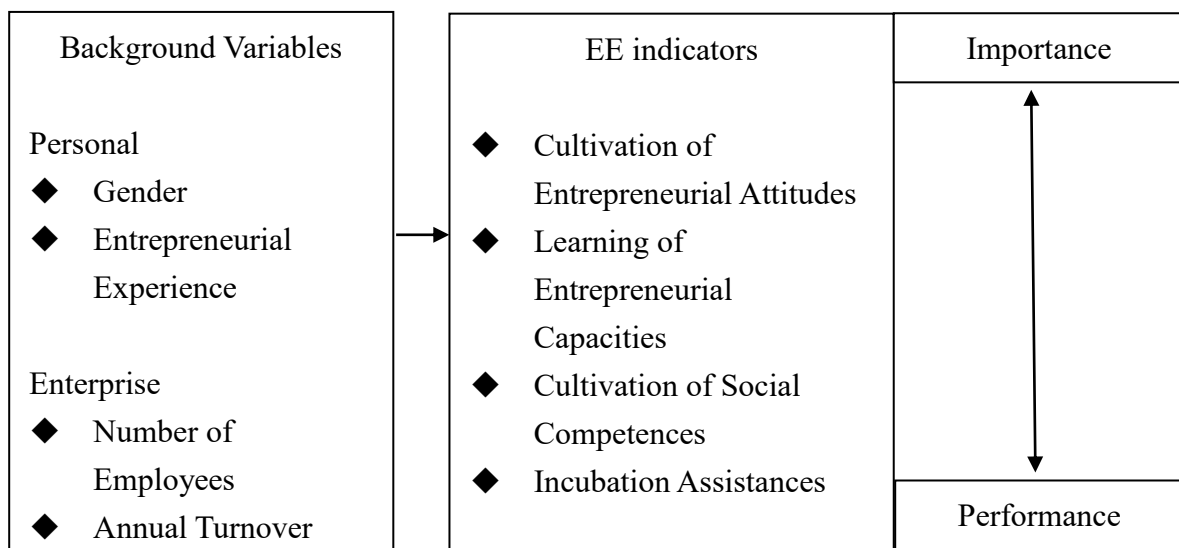


Figure 1 Diagram of the Research

3.1 Research methods

3.1.1 Fuzzy Delphi Method

This study adopts the generalized average models (Klir & Folger, 1988) proposed by scholars as the method to integrate the consensus of decision-making groups, and sets 0.6 suggested by Wu Zhengda (1999). Chen and Hwang (1992) as the threshold value.

3.1.2 Importance-Performance Analysis

Importance-Performance Analysis (IPA) is proposed by Martilla and James (1977), which is a technique that makes relative comparisons of specified assessment programs based on the Importance and Performance.

3.2 Research objects

3.2.1 Experts' fitness and questionnaire objects in Fuzzy Delphi Method

eleven scholars, experts, government officials and enterprise representatives are invited to fill the fitness questionnaire targeted at EE indicators in HEIs that is initially created in the literature review, and provide professional opinions.

3.2.2 Questionnaire objects of Importance and Performance

IPA is used to create EE indicators in HEIs. Entrepreneurs of 261 enterprises that are subsidized by U-start Plan for Innovation and Entrepreneurship and still operating are invited to fill the Importance and Performance questionnaire, Research on the Creation and Application of EE Indicators in HEIs - Taking Taiwan U-start Plan for Innovation and Entrepreneurship as an example. Each enterprise receives one questionnaire, and total 261 questionnaires are sent, 182 of which are recovered with a recovery rate of 69.73%.

4. Research results and discussions

4.1 Creation results of EE indicators in HEIs

4.1.1 Results analysis on experts' fitness questionnaire

This study invites eleven experts, scholars, government officials and enterprise representatives that are related to EE to fill the experts' fitness questionnaire, the results of which are summarized in Table 1. The EE indicators in HEIs that has a more than 80% total percentage of the "Fit" and "Fit after adjustment" options have been retained.

Table 1 Fitness assessment results of the research on the creation and application of
EE indicators in HEIs

Perspectives	Indicators (Success conditions of EE in HEIs)	Fitness			Total percentage of “Fit” and “Fit after adjustment”	Results	
		Fit	Fit after adjustment	Not Fit		Retain	Delete
(A) Cultivation of entrepreneurial attitudes	A1 EE can make entrepreneurs more confident and more willing to seek independence and freedom	10	0	1	91%	✓	
	A2 EE can encourage entrepreneurs willing to take risks and challenges, seek self-realization and achievements	9	1	1	91%	✓	
	A3 EE can prompt entrepreneurs to evaluate what they have learned at school, discover entrepreneurial opportunities and trends, and be willing to put them into practice	10	0	1	91%	✓	
	A4 EE enables entrepreneurs to actively organize and use resources	11	0	0	100%	✓	
(C) Learning of entrepreneurial capacities	C1 EE can prompt entrepreneurs to apply their entrepreneurial knowledge learned at school to the entrepreneurial process	10	0	1	91%	✓	
	C2 EE can enable entrepreneurs to equip enterprise	9	1	1	91%	✓	

	management capabilities					
	C3 EE can prompt entrepreneurs to handle market information and increase their success opportunities	9	1	1	91%	✓
	C4 EE can encourage entrepreneurs to establish work teams and contacts, get support and assistance	10	1	0	100%	✓
(S)	S1 EE can help entrepreneurs to get support from teachers, families and friends	9	1	1	91%	✓
	S2 EE can enable entrepreneurs to equip effective interpersonal communication skills	10	1	0	100%	✓
	S3 EE can enable entrepreneurs to have team spirits and build good relationship with employees	9	1	1	91%	✓
	S4 EE can prompt entrepreneurs to build good relationships with customers or business partners	9	0	2	82%	✓
(I)	Incubation assistances I1 EE can prompt entrepreneurs to use the space and equipment provided by the university to share resources for entrepreneurship	9	1	1	91%	✓

Perspectives	Indicators (Success conditions of EE in HEIs)					
Incubation assistance (I)	I2 EE can prompt entrepreneurs to use business services, management training, technical support and other entrepreneurial services provided by universities to enhance their success opportunities	10	1	0	100%	✓
	I3 EE can help entrepreneurs to use the human resources and administrative service resources provided by universities to reduce entrepreneurship costs	10	0	1	91%	✓
	I4 EE can prompt entrepreneurs to use professional teams provided by universities to assist enterprise operating and reduce entrepreneurial operating risks	11	0	0	100%	✓

4.2 Results analysis of experts' questionnaire in Fuzzy Delphi Method

According to the answering results of experts' questionnaire in Fuzzy Delphi Method, it is found that the minimum fitness value L of the triangular fuzzy number of EE indicators in HEIs is between 0 and 0.4, all the maximum fitness value U is 1, the value M that may have the maximum level is between 0.470 and 0.801. Based on the anti-fuzzification of fuzzy sets proposed by Chen and Hwang (1992), this paper uses the Fuzzy Delphi 1.0 software package to calculate the right boundary value μ_R , left

boundary value μ_L and total value μ_T of various EE indicators in HEIs, and uses 0.6 suggested by Wu Zhengda (1999). Chen and Hwang (1992) as the threshold value to conduct screening, and found that the total value μ_T of all indicators is greater than 0.6. All the sixteen EE indicators in HEIs created in this study are retained, as shown in Table 2:

Table 2 Screening results of EE indicators in HEIs

Perspectives	Indicators (Success conditions of EE in HEIs)	Anti-fuzzification			Retain or not
		μ_R	μ_L	μ_T	
(A)	Cultivation of entrepreneurial attitudes A1 EE can make entrepreneurs more confident and more willing to seek independence and freedom	0.680	0.487	0.654	Retain
	A2 EE can encourage entrepreneurs willing to take risks and challenges, seek self-realization and achievements	0.771	0.460	0.656	Retain
	A3 EE can prompt entrepreneurs to evaluate what they have learned at school, discover entrepreneurial opportunities and trends, and be willing to put them into practice	0.780	0.556	0.612	Retain
	A4 EE enables entrepreneurs to actively organize and use resources	0.774	0.560	0.607	Retain
(C)	Learning of entrepreneurial capacities C1 EE can prompt entrepreneurs to apply their entrepreneurial knowledge learned at school to the entrepreneurial process	0.768	0.534	0.617	Retain
	C2 EE can enable entrepreneurs to equip enterprise management capabilities	0.767	0.535	0.616	Retain
	C3 EE can prompt entrepreneurs to handle market information and increase their success opportunities	0.706	0.534	0.634	Retain
	C4 EE can encourage entrepreneurs to establish work teams and contacts, get support and assistance	0.809	0.512	0.648	Retain
(S)	Cultivation of social competences S1 EE can help entrepreneurs to get support from teachers, families and friends	0.753	0.511	0.621	Retain
	S2 EE can enable entrepreneurs to equip effective interpersonal communication skills	0.738	0.520	0.609	Retain
	S3 EE can enable entrepreneurs to have team spirits and build good relationship with employees	0.783	0.453	0.665	Retain
	S4 EE can prompt entrepreneurs to build good relationships with customers or business partners	0.724	0.493	0.616	Retain
(I)	Incubation assistances I1 EE can prompt entrepreneurs to use the space and equipment provided by the university to share resources for entrepreneurship	0.796	0.466	0.675	Retain

I2 EE can prompt entrepreneurs to use business services, management training, technical support and other entrepreneurial services provided by universities to enhance their success opportunities	0.782	0.493	0.644	Retain
I3 EE can help entrepreneurs to use the human resources and administrative service resources provided by universities to reduce entrepreneurship costs	0.745	0.516	0.614	Retain
I4 EE can prompt entrepreneurs to use professional teams provided by universities to assist enterprise operating and reduce entrepreneurial operating risks	0.834	0.428	0.703	Retain

4.3 IPA difference of EE indicators in HEIs under different background variables

The IPA of EE indicators in HEIs (including cultivation of entrepreneurial attitudes, learning of entrepreneurial capacities, cultivation of social competences and incubation assistances) based on different background variables of enterprises subsidized by the U-Start Plan for Innovation and Entrepreneurship (gender, entrepreneurial experience, number of employees, annual turnover) is as follows:

(1) Importance analysis of EE indicators in HEIs under different background variables

This study found that the perspective of “cultivation of social competences” is more important for female entrepreneurs than male entrepreneurs, and female entrepreneurs believe it relatively important to have good relationship with partners. Enterprises with longer entrepreneurial years (6-10 years) believe that the perspective of “incubation assistances” is significantly more important than that of enterprises with relatively shorter entrepreneurial years (1-5 years).

(2) Performance analysis of EE indicators in HEIs under different background variables

Enterprises with longer entrepreneurial years (6-10 years) have a significantly better performance on the perspective of “cultivation of social competences” than that of enterprises with relatively shorter entrepreneurial years (1-5 years), and are satisfied with the performance that enterprises build a good relationship with customers or business partners. Enterprises with relatively large number of employees (more than 7 people) and higher annual turnover (more than \$333,334) show significantly better performance on the two perspectives of “cultivation of social competences” and “incubation assistances” than that of enterprises with relatively small number of employees (1-6 people) and lower annual turnover (0 - \$333,333).

4.4 IPA of EE indicators in HEIs

This paper summarizes the average value rankings of importance and performance of EE in HEIs on entrepreneurs whose enterprises are subsidized by U-start Plan for Innovation and Entrepreneurship and still operating, as shown in Table 3. It is found that the average value of importance and performance on each perspective is more than 4 points, of which the two perspectives of “cultivation of entrepreneurial attitudes” and “incubation assistances” are ranking top two, followed by the perspectives of “cultivation of social competences” and “learning of entrepreneurship capacities”, showing that entrepreneurs have higher cognition on the perspectives of “cultivation of entrepreneurial attitudes” and “incubation assistances”.

Table 3 Average value rankings of the importance and performance on the perspectives of EE in HEIs

Perspective	Importance		Performance	
	Average	Ranking	Average	Ranking
Cultivation of entrepreneurial attitudes (A)	4.489	1	4.799	2
Learning of entrepreneurial capacities (C)	4.060	4	4.372	4
Cultivation of social competences (S)	4.409	3	4.603	3
Incubation assistances (I)	4.455	2	4.854	1
Total	4.353		4.657	

The average value rankings of the importance and performance of EE indicators in HEIs on entrepreneurs whose enterprises are subsidized by the U-start Plan for Innovation and Entrepreneurship and still operating are shown in Table 4. The top three average values of the importance and performance of the sixteen EE indicators in HEIs in this study are “A2, success conditions of EE in HEIs, EE can encourage entrepreneurs more willing to take risks and challenges, seek self-realization and achievements”, “I4, success conditions of EE in HEIs, EE can prompt entrepreneurs to use professional teams provided by universities to assist enterprise operating and reduce entrepreneurial operating risks” and “A1, success conditions of EE in HEIs, EE can make entrepreneurs more confident and more willing to seek independence and freedom”.

Table 4 Average value rankings of the importance and performance of EE indicators in HEIs

Perspectives	Indicators (Success conditions of EE in HEIs)	Importance		Performance	
		Average	Ranking	Average	Ranking
(A)	A1 EE can make entrepreneurs more confident and more willing to seek independence and freedom	4.538	4	4.912	3
	A2 EE can encourage entrepreneurs willing to take risks and challenges, seek self-realization and achievements	4.698	1	4.978	1
	A3 EE can prompt entrepreneurs to evaluate what they have learned at school, discover entrepreneurial opportunities and trends, and be willing to put them into practice	4.319	12	4.676	8
	A4 EE enables entrepreneurs to actively organize and use resources	4.401	10	4.632	9
(C)	C1 EE can prompt entrepreneurs to apply their entrepreneurial knowledge learned at school to the entrepreneurial process	4.418	7	4.632	9
	C2 EE can enable entrepreneurs to equip enterprise management capabilities	3.725	16	4.258	15
	C3 EE can prompt entrepreneurs to handle market information and increase their success opportunities	3.907	15	4.225	16
	C4 EE can encourage entrepreneurs to establish work teams and contacts, get support and assistance	4.192	13	4.374	14
(S)	S1 EE can help entrepreneurs to get support from teachers, families and friends	4.154	14	4.544	13
	S2 EE can enable entrepreneurs to equip effective interpersonal communication skills	4.478	6	4.593	11
	S3 EE can enable entrepreneurs to have team spirits and build good relationship with employees	4.593	2	4.588	12
	S4 EE can prompt entrepreneurs to build good relationships with customers or business partners	4.412	8	4.687	7
(I)	I1 EE can prompt entrepreneurs to use the space and equipment provided by the university to share resources for entrepreneurship	4.407	9	4.857	4
	I2 EE can prompt entrepreneurs to use business services, management training, technical support and other entrepreneurial services provided by universities to enhance their success opportunities	4.368	11	4.824	5

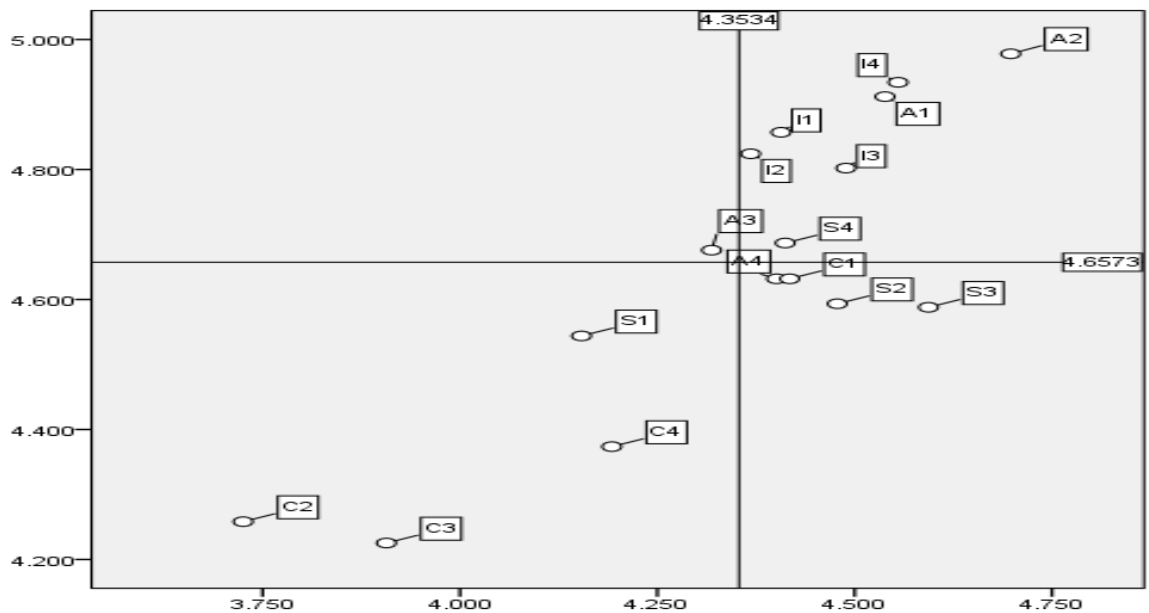
I3 EE can help entrepreneurs to use the human resources and administrative service resources provided by universities to reduce entrepreneurship costs	4.489	5	4.802	6
I4 EE can prompt entrepreneurs to use professional teams provided by universities to assist enterprise operating and reduce entrepreneurial operating risks	4.555	3	4.934	2

4.5 IPA of EE indicators in HEIs

This study uses the IPA as the major research method, with “Importance” being as the horizontal axis and “Performance” being as the vertical axis, to mark the average value of the importance and performance of each EE indicators in HEIs on the two-dimensional matrix diagram, as shown in Figure 1:

Figure 1 IPA of EE indicators in HEIs

Performance



Importance

It can be seen from the Figure 1 that the average value of the importance of EE indicators in HEIs for entrepreneurs whose enterprises are subsidized by the U-start Plan for Innovation and Entrepreneurship and still operating is 4.3534, the average value of performance is 4.6573, and the midpoint of the coordinate is (4.3534, 4.6573). The quadrants distribution of EE indicators in HEIs are shown in Table 5:

Table 5 Quadrants distribution of the IPA of EE indicators in HEIs

Quadrants	EE indicators
Quadrant I (Concentrate Here)	A1 、 A2 、 S4 、 I1 、 I2 、 I3 、 I4
Quadrant II (Keep up the Good Work)	A3
Quadrant III (Low Priority)	C2 、 C3 、 C4 、 S1
Quadrant IV (Possible overskill)	A4 、 C1 、 S2 、 S3

The indicators in the fourth quadrant means high importance and relatively lower performance, the latter of which urgently needs to be improved and is also the priority of the study's research, that is, "A4, success conditions of EE in HEIs, EE enables entrepreneurs to actively organize and use resources", "C1, success conditions of EE in HEIs, EE can prompt entrepreneurs to apply their entrepreneurial knowledge learned at school to the entrepreneurial process", "S2, success conditions of EE in HEIs, EE can enable entrepreneurs to equip effective interpersonal communication skills" and "S3, success conditions of EE in HEIs, EE can enable entrepreneurs to have team spirits and build good relationship with employees".

5. Conclusion and suggestions

5.1 Conclusion

(1) The EE indicators in higher education includes sixteen indicators in four perspectives: “cultivation of entrepreneurial attitudes”, “learning of entrepreneurial capacities”, “cultivation of social competences” and “incubation assistances”.

(2) The two perspectives of “cultivation of entrepreneurial attitudes” and “incubation assistances” in EE indicators in HEIs have the highest cognition level.

(3) The perspective of “incubation assistances” in EE indicators in higher education has the best performance, while the perspectives of “cultivation of social competences” and “learning of entrepreneurial capacities” have relatively lower performance, which needs to be improved with priority.

(4) This study uses the IPA, and found that the four indicators in the fourth quadrant urgently needed to be improved are: “A4, entrepreneurs actively organize and use resources”, “C1, entrepreneurs apply their entrepreneurial knowledge learned at schools to the entrepreneurial process”, “S2, entrepreneurs cultivate the effective interpersonal communication skills” and “S3, entrepreneurs learn to form team spirits, and build a good cooperation relationship with entrepreneurship partners”.

(5) The importance for female entrepreneurs in the perspective of “cultivation of social competences” and enterprises with relatively longer entrepreneurial years (6-10 years) in the perspective of “incubation assistances” is relatively significant, while the performance for enterprises with longer entrepreneurial years (6-10 years) and relatively large number of employees (more than 7 people) as well as relatively higher annual turnover (more than \$333,334) in the two perspectives of “cultivation of social competences” and “incubation assistances” is more significant.

5.2 Suggestions

Based on our conclusion, we make some suggestions, which can be used as a reference to promote entrepreneurship education decision in higher education and future research:

(1) The indicators of entrepreneurship education in higher education can be applied to other entrepreneurship education programs, and it can also be applied to understand the participants’ cognition of the importance and the performance of entrepreneurship education in higher education.

(2) Universities and colleges should strengthen the importance of “cultivation of social competences” and “learning of entrepreneurship capacities”.

(3) Universities and colleges should let students learn to organize and utilize resources actively and apply what they have learned to the entrepreneurial process.

(4) Education authorities should build social interaction between entrepreneurs and enhance the incubation center capabilities.

(5) There should be occasions where entrepreneurs who own a large-scale enterprise with a long history can share their experience.

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