



ORIGINAL RESEARCH ARTICLE

Identifying the Factors Affecting the Entrepreneurial Ecosystem
Model in the University

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ARTICLE INFO

Article History:

Received: 2023/03/25

Revised: 2023/04/30

Accepted: 2023/05/16

Published Online: 2024/03/01

Keywords:

Entrepreneurial Ecosystem,
Knowledge-Based Entrepreneurship,
Entrepreneurial University.

Number of Reference: 13

Number of Figures: 0

Number of Tables: 9

DOI:

<https://doi.org/10.22034/lss.2023.175883>



Publisher:

Ayande Amoozan -e- ATA (AAA)

ABSTRACT

Purpose: This research aims to identify the factors affecting the entrepreneurial ecosystem model in the university. In recent years, attention to entrepreneurship has increased in addition to educational and research missions in universities and scientific centers around the world.

Method: This mixed research is a survey that used the library method to identify the factors affecting the entrepreneurial ecosystem of the university, and in the next step, the influence of these factors has been investigated using the regression method. The studied population was experts of Azad University. Because the exact statistics of the statistical population were not available, the number of 384 people (emphasizing the adequacy of the Cochran sample size formula) was considered. SPSS version 25 statistical software was used for data analysis. In the quantitative part, a researcher-made questionnaire was used to collect data.

Findings: Based on the investigations, 11 effective components were identified and evaluated. Structural factors, government factors, opportunity recognition, content factors, financial factors, economic factors, development and transfer of entrepreneurship, technological entrepreneurship, environmental factors, managerial factors, educational factors, cultural factors, scientific and technological factors, government factors, and leadership factors. Based on the regression method, all factors were confirmed.

Conclusion: The findings of the present research show the fact that academic entrepreneurship is faced with a complex set of different components that creates its ecosystem. So that each of the dimensions of this sphere is woven into the internal components of the university and the higher education system, as well as the external components and subsystems of society. ©authors

► **Citation:** Mir, N., Rahimikia, A., & Daraei, M. (2024). Identifying the Factors Affecting the Entrepreneurial Ecosystem Model in the University. *The International Journal of Learning Space Studies(IJLSS)*, 1(3): 13-20. <https://doi.org/10.22034/lss.2023.175883>

Introduction

The 21st century has been introduced as the century of knowledge (Hayter et al., 2018). In this era, the main capital of societies is the knowledge, skill, and attitude of their human resources. For this capital to serve the welfare of society, entrepreneurial skills are needed. Currently, entrepreneurship development is the core of countries' development programs (Baharestan et al, 2023). Therefore, investing in the entrepreneurial capabilities of human resources has a special place. Development and growth have always been the main axis of the policies and programs of different countries, and the two important paths to pursue have been to provide optimal conditions for entrepreneurship and also the development of technologies (Elia et al., 2020). Iran has special characteristics such as huge natural resources, young and educated human capital, and a semi-state economic structure that is trying to achieve efficiency-oriented growth (Ezzati Rad et al., 2011).

In recent years, attention to entrepreneurship has increased in addition to educational and research missions in universities and scientific centers around the world, and therefore entrepreneurship training courses have expanded them (Coad et al, 2021). The strategies of providing financial aid for the effectiveness of education in research and development, expanding business accelerators, and facilitating and providing financial resources for businesses have not resulted in the creation of high-growth enterprises, and it seems that adopting the approach of creating an entrepreneurial ecosystem in this regard is a way forward. (Belitski et al., 2017). Evidence shows that environmental support and creating a suitable environment for the effectiveness of the educational system and educational technologies in the creation and development of businesses can have an effective impact on their entrepreneurial path (Entezari, 2016). The entrepreneurial ecosystem is defined as close relationships between people, the government and related institutions, and other influential components to support entrepreneurial activities in a specific geographical area (Guerrero et al, 2020). This ecosystem may be formed at the regional or national level and even at the level of the university itself (Hajihoseini et al, 2018). The existence of an ecosystem plays an important role in economic development. Accordingly, universities are tied to the entrepreneurial ecosystem on two levels. The first level is their existence as part of the regional entrepreneurship ecosystem and the second level is the entrepreneurship ecosystem within the university itself (Weerasekara et al, 2022). Regarding the entrepreneurial ecosystem inside the university, factors such as a favorable educational atmosphere, management, and leadership, suitable infrastructure such as training courses can play an effective role in cultivating potential entrepreneurial students (Theodoraki et al, 2022). Also, modern universities have gone even further and introduced the field of entrepreneurship as a separate field of study and have invested significantly in this field (Panahi et al, 2022). On the other hand, in many countries, the share of successful high-growth companies formed by university students and graduates is not significant compared to the growth rate of entrepreneurship education in universities (Radko et al, 2022).

In this regard, one of the important paths that require attention and action regarding the emergence and growth of technological entrepreneurship in the country is aimed at adopting an ecosystem approach, which means considering the interactive system between entities and their environment. Although this approach in the field of technological entrepreneurship has not been accurately conceptualized, yet paying attention to other areas related to it, such as the entrepreneurial ecosystem, the innovation ecosystem of technological entrepreneurship models can serve as an important basis for understanding, understanding and structuring this ecosystem to have a favorable effect on strategies. Development and reform policies and programs should be considered. Therefore, the requirement for the development of entrepreneurship in any society (such as a university) is a systematic view of entrepreneurship by officials, so that they pay attention to economic, cultural, and regulatory factors related to entrepreneurship at the same time and consider all dimensions in an ecosystem in formulating entrepreneurship

development policies. Based on this, this study aims to identify the effective factors of the entrepreneurial ecosystem model at Azad University.

Method

This research has been done in a mixed way. In terms of methodology, it is a survey. In the first step, the library method has been used to identify the factors affecting the entrepreneurial ecosystem of the university, and in the next step, the influence of these factors has been investigated using the regression method. The studied community were experts of Azad University. Due to the fact that the exact statistics of the statistical population were not available, the number of 384 people (emphasizing the adequacy of the Cochran sample size formula) was considered. SPSS version 25 statistical software was used for data analysis. In the quantitative part, a researcher-made questionnaire is used to collect data. Questionnaire questions were compiled using research literature and the results of qualitative data analysis. This open-ended questionnaire consisted of 11 components designed on a 5-point Likert scale. To determine the validity of the questionnaire, face and content validity were checked by the experts and Cronbach's alpha coefficient was used to determine the reliability. Also, in order to check the reliability of the structure, the composite reliability index CR and average variance extracted AVE were used.

Table 1. Identifying factors affecting the entrepreneurial ecosystem model in Azad University

Row	Sub-themes (components).
1	Structure
2	Government
3	Development and transfer of entrepreneurship
4	Technological entrepreneurship
5	Environmental factors
6	Management factors
7	Educational factors
8	cultural factors
9	Scientific and technological factors
10	Government policy
11	Leadership policy

Findings

The condition for establishing the reliability of the structure is that the composite reliability size is greater than 0.7 and the average size of the extracted variance is greater than 0.5. To check construct validity, two types of convergent and divergent validity were investigated. Convergent validity refers to whether the items measure exactly the same concept that is intended. The condition for establishing convergent validity is that the composite reliability objective for each construct is greater than the extracted average (AVE>CR). The results related to the reliability and validity index of quantitative questions are given in Table 2.

Table 2. The results related to the reliability and validity indicators of quantitative questionnaire questions

Dimensions	R ²	GOF	Cronbach's alpha	Communality	CR	Q ²	AVE
Structure	0.99	0.79	0.716	0.641	0.914	0.589	0.577
Government			0.701	0.713	0.906	0.561	0.627

Development and transfer of entrepreneurship			0.767	0.697	0.931	0.645	0.601
Technological entrepreneurship			0.779	0.754	0.896	0.551	0.716
Environmental factors			0.723	0.658	0.765	0.513	0.643
Management factors			0.819	0.597	0.882	0.528	0.565
Educational factors			0.903	0.638	0.913	0.583	0.521
cultural factors			0.766	0.751	0.895	0.539	0.536
Scientific and technological factors			0.768	0.589	0.786	0.503	0.534
Government policy			0.723	0.635	0.846	0.651	0.644
Leadership policy			0.736	0.756	0.746	0.449	0.58
Average standard			0.764	0.675	0.862	0.556	0.595

The results of the evaluation of the fit of the models in the above table indicate that based on the average composite reliability index (CR=0.862), and the average Cronbach's alpha coefficients (0.764) which is greater than 0.7 and according to the average size of the variance extracted (AVE=0.595) which is more than 0.5, the model has convergent reliability and considering that (AVE<CR), convergent validity is also established.

Data description

Table 3. Descriptive information about the subjects' gender

Percent	Frequency	gender
57.6	221	Man
42.4	163	Female
100	384	Total

The descriptive statistics presented in Table 3 show that 57.6% of the subjects were male and 42.4% were female.

Table 4. Descriptive information related to the age of the subjects

Age	Frequency	Percent
Less than 30 years	28	7.3
31 to 40 years	69	18
41 to 50 years	180	46.9
More than 50 years	107	27.9
Total	384	100

The descriptive statistics presented in Table 4 show that 7.3% of subjects were less than 30 years old, 18% were between 31 and 40 years old, 46.9% were between 41 and 50 years old, and 27.9% were older than 50 years old.

Table 5. Descriptive information related to the level of education of the subjects

Level of education	Frequency	Percent
Associate degree	16	4.2
Bachelors	65	16.9
Masters	146	38
P.H.D	157	40.9
Total	384	100

As shown in Table 5, 4.2% of the subjects had an associate's degree, 16.9% a bachelor's degree, 38% a master's degree, and 40.9% a doctorate.

Table 6: Descriptive information related to the subjects' work experience

work experience	Frequency	Percent
Less than 10 years	33	8.6
11 to 15 years	55	14.3
16 to 20 years	142	37
21 to 25 years	112	29.2
26 years and above	42	10.9
Total	384	100

As shown in Table 6, 8.6% of the subjects have less than 10 years of work experience, 14.3% between 11 and 15 years, 37% between 16 and 20 years, 29.2% between 21 and 25 years and 10.9% were more than 26 years old.

Table 7. Descriptive information related to job title

Job title	Frequency	Percent
Employee	168	43.8
Faculty	132	34.4
Assistance	57	14.8
Presidency	27	7
Total	384	100

According to the information in Table 7 regarding the job titles of the subjects, 43.8% were employees, 34.4% were faculty members, 14.8% were university vice-chancellors, and 7% were heads of Azad University units.

Description of research variables

Table 8. Mean and standard deviation of model components

Variable	Mean and standard deviation	Elongation	Skewness	Maximum	Min
Entrepreneurial structure	3.94 ± 0.58	82/1	1/1	5	56/1
Government agents	3.79 ± 0.79	1-16	1/16-	5	1-14
Development and transfer of entrepreneurship	3.54 ± 0.82	0.062-	-0.56	5	4/1
Technological entrepreneurship	3.84 ± 0.86	1/16	1/13-	5	2/1
Environmental factors	3.74 ± 0.86	0.313	-0.858	5	5/1
Management factors	3.79 ± 0.62	- 0.433	-0.574	4.75	13/2
Educational factors	3.77 ± 0.55	52/1	-0.967	4.78	67/1
cultural factors	3.72 ± 0.71	0.808	-0.914	4.69	1/13
Scientific and technological factors	3.68 ± 0.68	0.071	0/806	44.86	1/14
Government policy	3.59 ± 0.76	0.124	0.632-	4.89	33/1

Leadership policy	3.62 ± 0.83	0/082	-0.665	5	25/1
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In Table 8, it can be seen that the average of the variables, the standard deviation, and the minimum and maximum data related to the components of the entrepreneurial ecosystem can be seen separately. Considering that each statement has five options, the number 3 is considered as the average of each statement. As it can be seen, the average of all components is more than 3, so it is seen in a desirable level in the statistical population. On the other hand, among the components of the entrepreneurial ecosystem, autonomy had the highest average with an average of 3.91.

Also, considering that the value of skewness and kurtosis for the mentioned variables is in the range (+2 and -2), therefore, it can be concluded that the data distribution is probably normal.

Community Normality Test (Kolmogorov-Smirnov)

Since the normality of the variables leads to the normality of the residuals of the model; It is necessary to check its normality before testing the hypotheses. Kolmogorov-Smirnov test was used to check the normality of data distribution. In this test, whenever the significance level is greater than 0.05, the null hypothesis is rejected at the 95% confidence level.

Table 9. Examination of data distribution using the Kolmogorov-Smirnov test

	Z	The significance level	Distribution status
Entrepreneurial structure	0.614	0.85	It is normal
Government agents	76/1	0.61	It is normal
Development and transfer of entrepreneurship	0.089	0.2	It is normal
Technological entrepreneurship	0.739	0.67	It is normal
Environmental factors	0.06	0.2	It is normal
Management factors	0.089	0.2	It is normal
Educational factors	0.63	0.86	It is normal
cultural factors	0.081	0.2	It is normal
Scientific and technological factors	0.079	0.2	It is normal
Government policy	0.059	0.2	It is normal
Leadership policy	0.157	0.2	It is normal

Based on the values presented in Table 9 Since the values of the significance level for the presented variables are greater than 0.05 (Sig>0.05), therefore the null hypothesis that the variable is normal is confirmed, so the statistical population has a normal distribution.

Discussion

The findings of the current research show the fact that academic entrepreneurship is faced with a complex set of different components that creates its own ecosystem. So that each of the dimensions of this sphere is woven into the internal components of the university and the higher education system, as well as the external components and subsystems of society. The findings of the research indicated that the development of entrepreneurship should be comprehensive,

holistic, and sustainable because creating an entrepreneurial environment does not depend on luck and coincidence; It requires the understanding of opportunities by people, the skill of starting new businesses, and the ability to accept risk. Also, the creation of an entrepreneurial ecosystem in the country requires the provision of a series of hardware and software prerequisites, related to industrial, scientific, and capitalist centers. In addition to that, the successful implementation of an entrepreneurial ecosystem in society requires solving the obstacles and problems of entrepreneurs in various social, cultural, and economic fields. Also, it requires various political and legislative support in terms of access to markets, lower bank interest rates, and lower taxes for entrepreneurs.

The results regarding the application of indicators and components of the entrepreneurial ecosystem in the general policies of the first to fifth programs show that in these documents, the same attention has not been paid to the different dimensions of the entrepreneurial ecosystem so that in the general policies of the first to fifth programs, the market dimension receives the most attention and the culture dimension receives the least attention. has had, while the development of entrepreneurship should be comprehensive, holistic, and sustainable, in such a way that it pays attention to economic, cultural, social, and regulatory factors at the same time; Therefore, the policies that are formulated for the development of entrepreneurship must cover all its dimensions. In fact, entrepreneurship development can only happen through an ecosystem approach. The basis of using this approach is systematic thinking. Having a holistic view helps the development of entrepreneurship to affect the entire ecosystem and creates valuable cycles between all components of the ecosystem. The results obtained are consistent with the research of Ezzati Rad et al. (2022).

Conclusion

This research has been carried out to identify the factors affecting the entrepreneurial ecosystem model in the university. In recent years, attention to entrepreneurship has increased in addition to educational and research missions in universities and scientific centers around the world, and therefore entrepreneurship training courses have expanded them. The problems of underdevelopment of the market are considered one of the basic challenges of the development of entrepreneurial businesses. The results of this research showed that the instability in the market, the weakness of the information system in the field of the market at the national and international levels, the existence of middlemen and brokers, the weakness of the pricing system, the lack of market supervision, the lack of infrastructure facilities are the main obstacles facing entrepreneurs; In other words, in the general policies of the system, paying attention to the market is especially important, but it is only in the document and not in practice. Based on the research results, it is suggested:

- Have detailed planning regarding the development and promotion of entrepreneurial structure among students and professors.
- Government managers and decision makers are suggested to provide the necessary infrastructure to optimize the entrepreneurial university.
- It is suggested to provide up-to-date and modern equipment for the university
- The use of experienced managers with a spirit of innovation and entrepreneurship is another suggestion in this research.
- It is also suggested to Azad University managers to put innovative management system in their work agenda.
- It is suggested to provide the necessary conditions for students to continue their entrepreneurship in the labor market.

Declaration of Competing Interest

The author declares that he has no competing financial interests or known personal relationships that would influence the report presented in this article.

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