




Original Article

The effective factors on empowerment of faculty members to launch start-ups

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Abstract

Background: This study aimed to investigate the factors affecting the empowerment of faculty members to launch start-ups in the branches of the Islamic Azad University of Tehran.

Methods: This research was descriptive-analytical. Its statistical population included 27,000 faculty members working in the Islamic Azad University, Tehran branch. The sampling method was cluster random sampling. The sample size was 50 people in the qualitative part and 384 people in the quantitative part. The research tools were researcher-made questionnaires, with a Likert scale and semi-structured interviews. For statistical analysis, confirmatory factor analysis tests, t-tests, and multivariate regression were used by SPSS software version 23.

Results: The results showed that there is a significant difference in the components affecting empowerment, including marketing and commercialization of knowledge ($\beta=0.354$), attracting elites and from business ($\beta=0.306$), and knowledge sharing ($\beta=0.265$). financial risk analysis ($\beta=0.143$), formation of business support association ($\beta=0.111$), value design and use of new technologies ($\beta=0.075$), financial and legal support of the government ($\beta=0.066$), creating environmental changes ($\beta=0.056$), increasing value-creating activities ($\beta=0.044$), providing infrastructure ($\beta=0.037$), and discussing startups ($\beta=0.024$) in the order of priority. The partial regression showed the impact of discussion about startups and environmental changes on the empowerment of faculty members.

Conclusion: It is essential to consider human resources, knowledge commercialization, elite recruitment, knowledge sharing, financial risk analysis, financial and business support, use of new technologies, environmental change, value creation activities, providing infrastructure, about start-ups based on the transformational attitude of management.

Keywords: Empowerment; Faculty; Start-up; Universities.

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Introduction

Start-ups must have the perfect business and product with a greater chance of success without the need for large external investments (1). Start-ups are usually based on risk-taking ideas whose business model is unclear and whose

target market is hypothetical. Hence, they have lower start-up costs, high risk, and high potential return on investment (2). To start a business through testing, products from start-ups must be quickly validated in the market. This approach is based on

scientific experimentation, product reproducibility, and customer feedback to get the right product (3). In 2012, the business ecosystem of start-ups was formed and events for launching the start-ups were formed. After that, companies and universities started holding workshops and exhibitions and forming creative teams. Over time, technology transfer offices, facilitators, and investment companies became active (4).

Also, empowerment will create opportunities for job satisfaction, job commitment, better communication between employees and managers, greater effectiveness of decision-making processes, improved operations, reduced costs, and productivity of the organization and the company. Designing a comprehensive model can directly or indirectly change the attitude and behavior of employees and provide the basis for training professional and capable human resources (5). Since human beings are the center of organizational change, to achieve an acceptable level of organizational maturity, it is necessary to improve the level of human resources (6). In search to Sandberg (7) and Trauffer & Tschirky (8), the problems and challenges of the unknown market and customer needs, resistance and lack of confidence in potential customers, and the threat of the creation of competitors up. Therefore, the facilitation of faculty members can develop a culture of empowerment in which the ideals, goals, decision-making boundaries, and results of the effects and efforts of managers and employees are shared throughout organizations and companies. Also, the lack of an appropriate model for their empowerment and lack of their localization has created problems in this

area and the lack of development of start-ups in universities can interrupt the growth and scientific and industrial development of the country. Thus, given the importance of the subject in this research, the model of empowering faculty members to launch start-ups in the branches of the Islamic Azad University of Tehran was examined.

Methods

The present study was applied research in terms of aim and was descriptive-analytical in terms of method. The statistical population of this study included all faculty members working in the branches of the Islamic Azad University of Tehran. Based on the statistics available on the website of the Islamic Azad University, their total number was 27000 people. Sampling was done among faculty members in the branches of the Islamic Azad University of Tehran using a cluster random method. Accordingly, first the technical and engineering faculties in the branches of the Islamic Azad University of Tehran were identified and then the faculty members in different fields of study were listed and sampling in each university was done by using a convenience random sampling among faculty members and 384 people were introduced as a sample.

The tools of this research included a researcher-made questionnaire, answers package with a Likert scale (through a two-question questionnaire including determining the current status of faculty members' empowerment to launch start-ups and designing a faculty empowerment model for start-ups and the classification of interviews and questionnaires and statistical analysis of the results for determining the appropriateness of the faculty members' empowerment model for launching start-ups) Table 1. The collected

Table 1. Number of questionnaire questions and their reliability

Row	Dimensions of faculty members' empowerment	Number of questions	Cronbach's alpha
1	Sharing knowledge	6	0.841
2	Conversation and discussion about start-ups	5	0.729
3	Forming start-ups support the association	3	0.695
4	Elite Recruitment	4	0.869
5	Increasing value-creation activities	5	0.784
6	Marketing and commercialization	4	0.599
7	Value design and use of new technologies	4	0.884
8	Financial and legal support	4	0.735
9	environmental changes	5	0.692
10	providing infrastructure	3	0.758
11	Financial risk analysis	4	0.844
12	Total number of questionnaires	47	0.766

data were analyzed in SPSS statistical software by using descriptive and inferential statistical indices. Data were used in the form of various statistical methods to investigate the relationship between variables and to design the model; a multivariate regression test was used. Data were analyzed using SPSS-23 software.

Results

The results of the study showed that 90% of the populations were women, age group over 40 years with 196 (51%) had the highest frequency, married with 250 people (65%) had the highest frequency. Also, a master's degree with 187 people (49%) had the highest frequency and start-up managers with 58 people (85%) had the highest frequency Table 2 and Figure 1.

Inferential analysis of data

The mean answers regarding the impact of components on faculty empowerment in launching start-ups showed a significant difference in all components Table 3.

According to the results of the Table 3, considering $\text{sig} < 0.05$ for all components, there are the same views on the impact of components on the empowerment of faculty members in launching start-ups.

Table 2. Demographic information of research participants

Variable	Subgroups	frequency	percentage
Gender	male	36	9.37%
	female	348	90.63%
Age	25 to 30 years	3	0.8%
	30 to 35 years	28	7.2%
	35 to 40 years	157	41%
	Over 40 years	196	51%
Marital status	Single	134	35%
	Married	250	65%
Educational degree	Associate	21	5.5%
	Bachelor	154	40%
	Master	187	49%
	PhD	18	4.6%
	Specialty	3	0.7%
Job	Subspecialty	1	0.2%
	University professor	58	15%
	Manager / Member of Start-up	326	85%

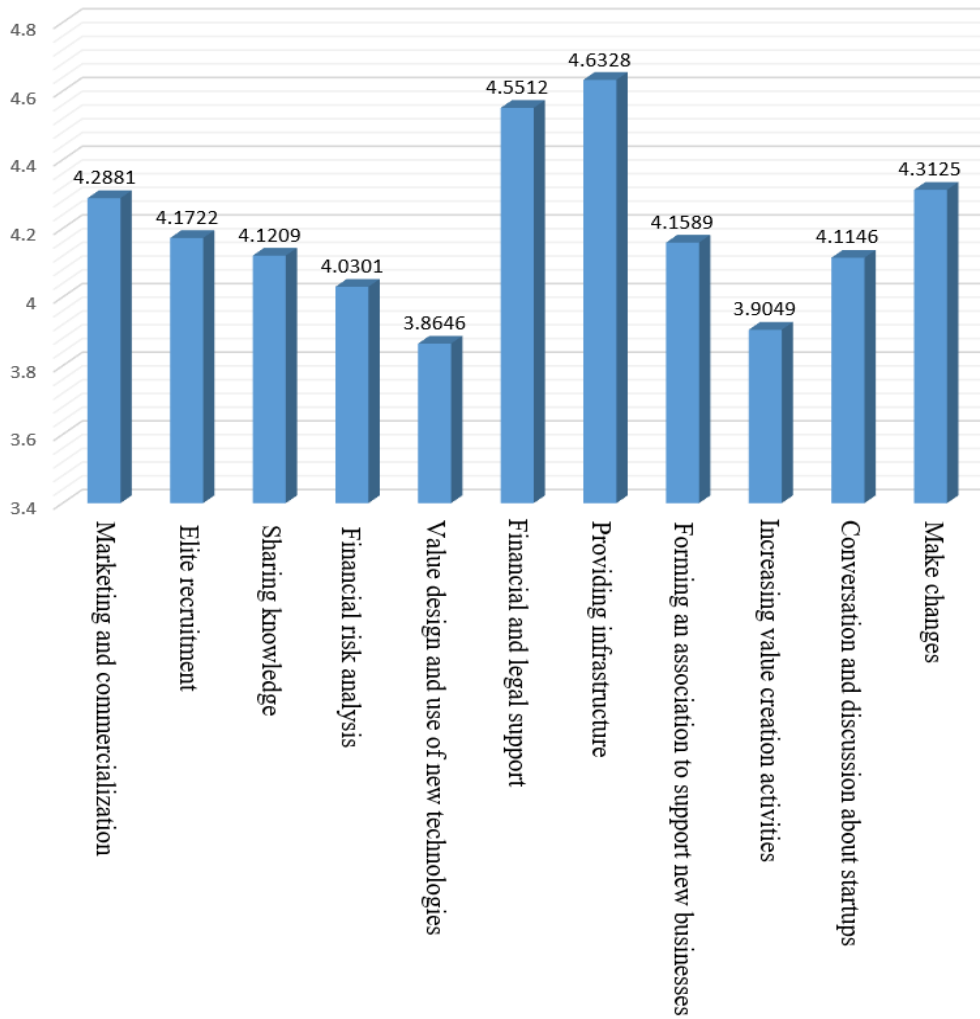


Figure 1. Mean of the components affecting faculty empowerment in launching start-ups

Table 3. T-test results to compare the mean answers regarding the impact of components on faculty empowerment in launching start-ups

Components	t	df	Sd	Sig	Mean difference	95 %confidence interval	
						Lower bound	Upper bound
marketing and knowledge commercialization	127.688	383	0.65808	0.001	4.28806	4.2220	4.3541
Elite Recruitment	132.529	383	0.61661	0.001	4.17216	4.1103	4.2340
Knowledge sharing	130.910	383	0.61687	0.001	4.12095	4.0591	4.1828
Financial risk analysis	137.757	383	0.57329	0.001	4.03013	3.9726	4.0877
Value design and use of new technologies	110.445	383	0.68568	0.001	3.86458	3.7958	3.9334
Government financial and legal support	146.992	383	0.60673	0.001	4.55122	4.4903	4.6121
Providing infrastructure	178.359	383	0.50900	0.001	4.63281	4.5817	4.6839
Forming a business support association	125.061	383	0.65166	0.001	4.15885	4.0935	4.2242
Increasing value-creation activities	116.134	383	0.65890	0.001	3.90495	3.8388	3.9711
Conversation and discussion about start-ups	107.625	383	0.74917	0.001	4.11458	4.0394	4.1898
environmental changes	97.033	383	0.87091	0.001	4.31250	4.2251	4.3999

Multivariate regression (determining the factors affecting empowerment and model design)

According to the results of Table 4, the effects of components (β) on the empowerment of faculty members of the Islamic Azad University in all models were statistically significant. This impact based on priority was $\beta=0.354$ for marketing and knowledge commercialization, $\beta=0.306$ for

elite recruitment, $\beta=0.265$ for knowledge sharing, $\beta=0.143$ for financial risk analysis, $\beta=0.111$ for the formation of business support association, $\beta=0.075$ for the design of new technologies, $\beta=0.066$ for government financial and legal support, $\beta=0.056$ for making environmental changes, $\beta=0.044$ for increasing value creation activities, $\beta=0.037$ for providing infrastructure, and $\beta=0.024$ discussing start-ups Figures 2-6.

Table 4. Multivariate Regression, Beta (β) of the impact of components on empowerment of faculty members in launching start-ups

model	Non-standard coefficients		Standard coefficients	t	Sig
	B	Standard error	β		
Constant	0.015	0.013	-	1.164	0.245
marketing and knowledge commercialization	0.231	0.003	0.354	78.303	<0.001
Elite Recruitment	0.213	0.002	0.306	88.447	<0.001
Knowledge sharing	0.184	0.002	0.265	73.976	<0.001
Financial risk analysis	0.107	0.002	0.143	44.733	<0.001
Value design and use of new technologies	0.047	0.002	0.075	22.209	<0.001
Government financial and legal support	0.047	0.002	0.066	22.042	<0.001
Providing infrastructure	0.031	0.002	0.037	13.777	<0.001
Forming a business support association	0.073	0.002	0.111	37.245	<0.001
Increase value-creation activities	0.029	0.002	0.044	14.542	<0.001
Conversation and discussion about start-ups	0.014	0.002	0.024	8.421	<0.001

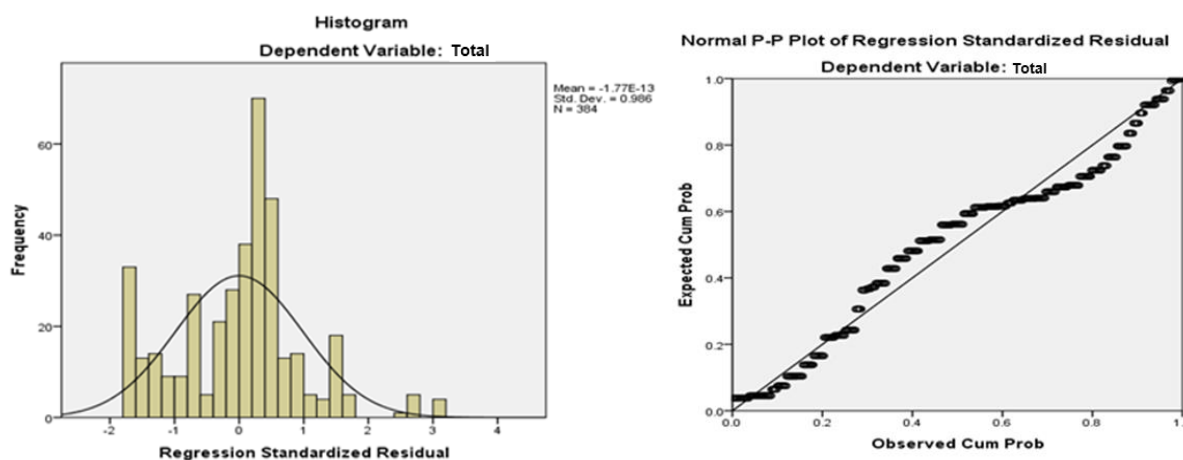


Figure 2. Residual standard regression and Standard regression scatter plot

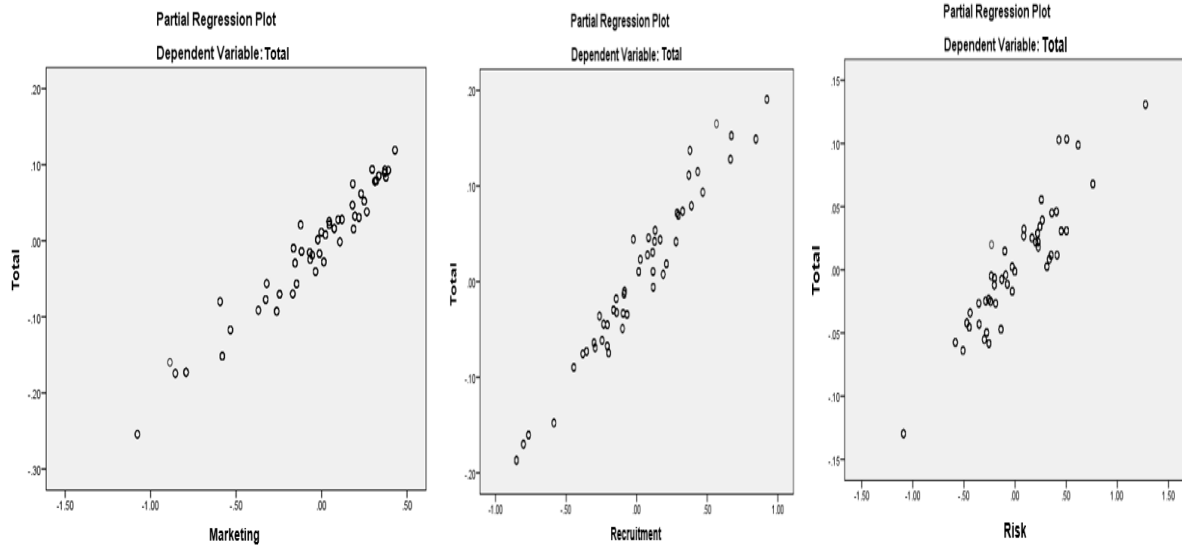


Figure 3. Partial regression of the impact of marketing and knowledge, elite recruitment commercialization, and knowledge sharing on the empowerment of faculty members in launching start-ups

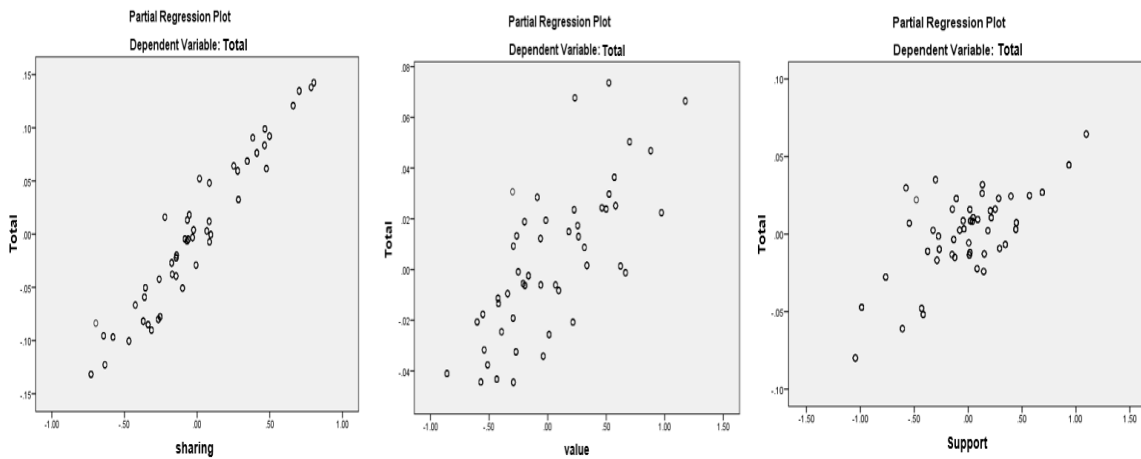


Figure 4. Partial regression of the impact of financial risk analysis, value design, and the use of new technologies and government financial and legal support on empowerment of faculty members in launching start-ups

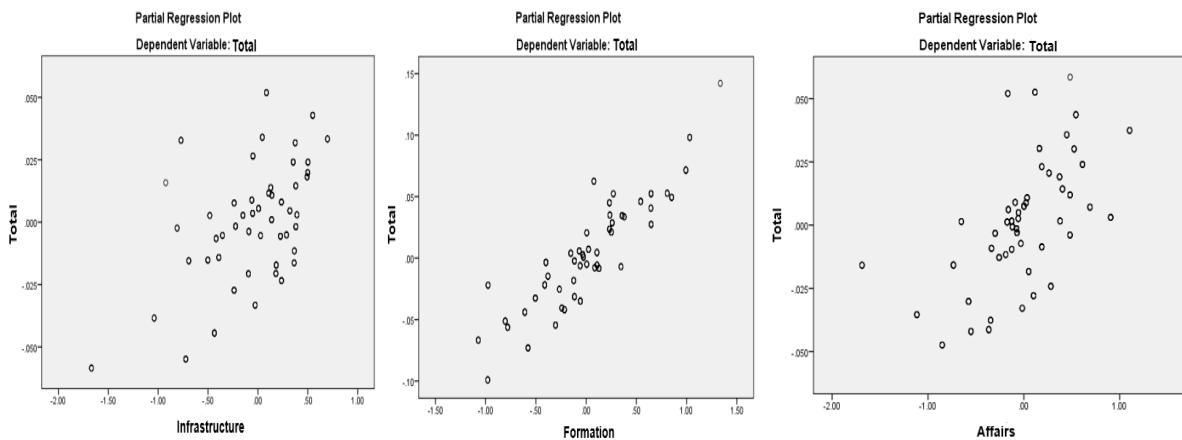


Figure 5. Partial regression of the impact of providing infrastructure, forming a business support association, and increasing value creation activities on empowerment of faculty members in launching start-ups

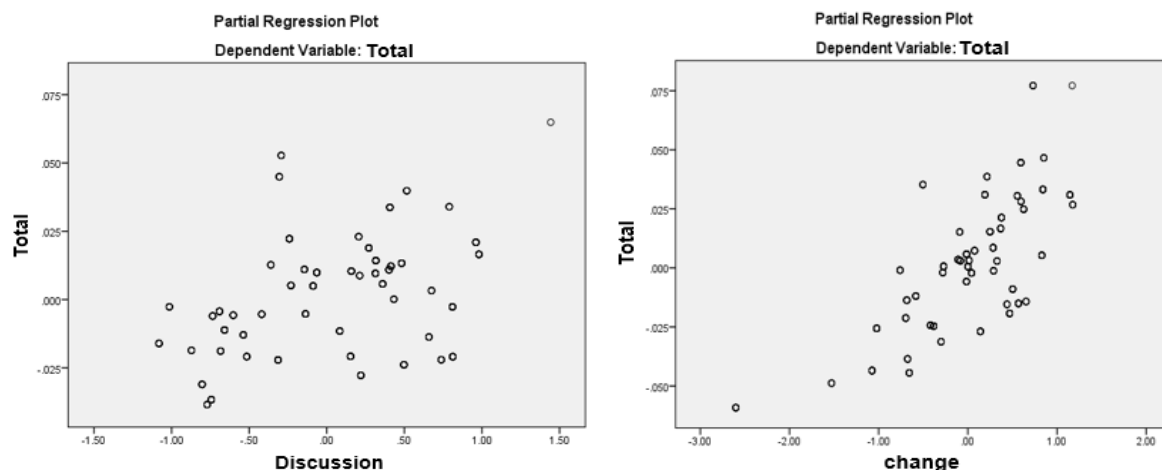


Figure 6. Partial regression of the impact of conversation and discussion about the start-ups and environmental changes on empowerment of the faculty members in launching start-ups

Discussion

Based on the results of this study, the mean components obtained in empowering faculty members in launching start-ups are: providing infrastructure, government financial and legal support, creating environmental changes, marketing and knowledge commercialization, elite recruitment, forming a business support association, knowledge sharing, conversation and discussion about start-ups, increasing value creation activities, and value design and use of new technologies. Also, there were the same views on the impact of components on the empowerment of faculty members in launching start-ups. According to the results, the effect of components (β) on the empowerment of faculty members of Islamic Azad University in launching start-ups is statistically significant.

Also, the effect of components (β) on the empowerment of faculty members of Islamic Azad University in launching start-ups was statistically significant with $\beta=0.143$ for financial risk analysis, According to the studies conducted by Sandberg (7) and Trauffer & Tschirky (8), the problems and challenges of start-ups include high costs of research and development in start-ups, unknown market, and customer needs, resistance and lack of confidence in potential customers, the

threat of the creation of competitors, the uncertainty in the success of a start-up business and the lack of continuity of existing laws on start-ups, finally, the uncertain distribution channels in the market. These results are in line with the results of the present study on the necessity of establishing relationships with business owners, and marketing and commercialization of knowledge in launching start-ups. In the research by Gelderen et al., the success and risk factors in the pre-launch stage of a startup have been investigated. Based on this, the effects considered by the researchers regarding new businesses have been evaluated based on the standard framework. This framework has shown that the efforts of a start-up are influenced by the personality characteristics that the business creates, the type of organization that is established, the environment in which the business is formed, and the process of starting the business. which is consistent with the results of the current research on creating environmental changes (9).

In our study, this impact based on priority was $\beta=0.354$ for marketing and knowledge commercialization, $\beta=0.306$ for elite recruitment, $\beta=0.265$ for knowledge sharing, $\beta=0.111$ for the formation of business support association, $\beta=0.075$ for the design of new technologies, $\beta=0.066$ for government financial and legal support,

$\beta=0.056$ for making environmental changes, $\beta=0.044$ for increasing value creation activities, $\beta=0.037$ for providing infrastructure, and $\beta=0.024$ discussing start-ups. Menkveld showed that the success of start-ups is determined by the innovative forces of the organization or the innovative power of its owners. Analyzing the strategies of tough competitors and using an organization and having a complete business plan, using innovation as a start-up business idea, joining various social networks, having a team of external consultants and active marketing are all factors for the success of start-ups are the form of an organizational approach. They are consistent with the results of this study based on the formation of a start-up business support association and the use of external consultants. Also, factors such as commitment, self-reliance, adaptability, and learning are known as important factors in the start-up business economy, which is in line with the results of the present study on knowledge sharing in launching start-ups. Studies suggest that customers and commitment to them and learning and applying experiences and human resource development will be an important factor in the success of start-up businesses (10). In research carried out by Khashei & Asady, entitled "Designing a model of Strategic Control in Internet-based Startups", they stated that success in today's turbulent and complex business environment requires insight and deep knowledge of the way of strategic control of the organization. Relying on their technical knowledge in this highly competitive environment, start-ups sometimes neglect the issue of control or eventually pursue strategic control. Evidence suggests that controlling strategic assumptions can play a key role in strategic control, which is in line with the results of the present study on knowledge sharing and conversation and discussion about start-ups and the use of internal and external consultants (11).

According to the results, all components were statistically significant. This impact

based on the design of new technologies, government financial and legal support increasing value creation activities, providing infrastructure in start-ups. In research conducted by Nadafi & Ahmadvand, entitled "Identification and Prioritization of Development Factors of Startups Using Q methodology", they stated that start-up businesses have a key role in creating employment and increasing production, but various factors are effective in the expansion of these businesses at the micro and macro levels. The results showed that the first model emphasizes the speed of action, teamwork, the nature of the idea, and opportunism and the second model emphasizes the customer, competitors, investor partner, and support. In the first model, attention is paid to creativity and paving the way for innovations in talented people through education and creating cultural contexts in the target community. The second model emphasizes the support of potential capacities, providing investment security and creating a team culture in the desired businesses, which is in line with the results of the present study (12). In research conducted by Daniali Dahhovz et al., entitled "Entrepreneurship, Knowledge, Innovation and Organizational Performance", he stated the learner seems to be an effective strategy in improving business performance and development that is closely associated with innovation. It also considers the dimensions of environmental awareness, analytical effort, commitment to new projects, and the scope of risk-taking and communication as an organizational capability in recognizing the value of knowledge derived from organizational learning and adapting innovative behavior to this value (13). In a study conducted by Hassanzadeh (14) under the title of "Ideation is the basis of the flourishing of creativity", the results showed that in small and medium-sized enterprises, cooperation, trust and learning have the greatest impact on organizational culture, employee skills, and structural factors, respectively, have the highest effect in explaining the

enablers. Explanatory variables of knowledge creation processes in small and medium-sized enterprises confirmed the effect of socialization, externalization, composition, and internalization in terms of the coefficients of impact. In research carried out by Dehghani, entitled “The Role of Knowledge Management in Organizational Innovation”, it was found that organizations strongly require enhancing their innovation capabilities, and it is achieved only in the light of paying attention to a valuable resource of knowledge and creativity and applying it (15). In research Groenewegen & Langen, investigated the development factors of startups in the first three years of launch. They have considered the three main factors of growth and success of startups, including the uniqueness of the benefits of using innovation, the organizational characteristics of start-up businesses, and the characteristics of the entrepreneur and innovator as main factors of the success of start-up businesses. This is consistent with the results of the current research on increasing value-creating activities and using creativity and innovation in starting up startups (16).

In a research conducted by Naderi et al., the findings of the research show that mismanagement and lack of identification of priorities, the inability of the government's information system to serve idea-oriented projects, management weakness and lack of making strategic decisions for progress, the limitation of providing facilities and equipment in the science and technology park, the high cost of providing equipment and basic requirements for starting a start-up, the length of the process of obtaining a construction permit, the time-consuming and costly process Obtaining the necessary permits from the relevant authorities is one of the limiting factors, and these results are in line with the findings of the current research on the necessity of financial and legal support from the government and the

provision of infrastructure for the launch of start-ups (17).

In research conducted by Saeida Ardakani et al., they have shown that innovation in organizations is one of the main drivers for competitiveness and national development. The results showed that the seven factors (interaction, leadership, communication, knowledge, integration, organizational support, and motivation) have a significant effect on innovation. which is in harmony with the current results of communication and financial and legal support of the government (18).

Organizational innovation will not emerge without participatory and dynamic knowledge management. For this reason, knowledge management is crucial for organizations. Nowadays, the knowledge management system derived from web technologies with the approach of socialization, cooperation, partnership, collaboration, and interaction between people, has tried to capture the largest and most valuable distributed knowledge base of the organization, which is tacit knowledge in the mind and the conscience of the organization employees. It is consistent with the results of the present study on knowledge sharing and learning.

Recommendations

The following recommendations are presented based on the research results:

In launching start-ups, participation in faculty members' decisions should be considered.

Knowledge sharing, information sharing, sharing experiences and refining experiences should be considered to empower faculty members in launching start-ups.

A well-developed program to learn and acquire knowledge about the organizational structure of start-ups should be included in academic planning.

Conversation and discussion about start-ups can be effective in empowering faculty

members. Therefore, it is necessary to plan in this regard.

Conclusion

The human factor is the most important element for maintaining the existence and survival of organizations and increasing attention to human resources is a powerful tool in organizational change and transformation. Hence, by applying it, we can take effective steps towards development and growth. One of the ways to promote and develop universities is to launch start-ups. It is essential for employees to improve their performance in the form of start-ups by learning knowledge, skills and motivation. Also, managers and decision makers in the country at the macro level must pay attention to start-ups, which is a new way of business to survive and expand the field of activity of the organization and entrepreneurship, review their management systems, and pay attention to changes in the workplace to survive in the current competitive environment. Hence, employee empowerment, as the main subject of leadership and management practices, has enabled organizations to become more competitive and encourage people to creativity and personal responsibility, allowing individuals to be accountable. It is hoped that effective steps be taken in the development of the country and entrepreneurship with the special attention of managers to new business methods (start-ups).

Conflict of interest

The authors declare that they have no conflict of interests.

Author's contribution

Zahra Hesari and Ramezan Jahanian developed the study concept and design. Mohammadali Hosseini acquired the data. Zahra Hesari and Ramezan Jahanian analyzed and interpreted the data, and wrote the first draft of the manuscript. All authors contributed to the intellectual

content, manuscript editing and read and approved the final manuscript.

Informed consent

Questionnaires were filled with the participants' satisfaction and written consent was obtained from the participants in this study.

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