Original Article

Identification and Design of an Entrepreneurial Competency Development Model for University Faculty Members

Fariba Zahedifar[1], Zahra Lebadi [2*], Fatemeh Parasteh Ghambvani [2]

[1] PhD student in Educational Management, Karaj Branch , Islamic Azad University, Karaj, Iran.

[2] Department of Educational Sciences, Karaj Branch, Islamic Azad University, Karaj, Iran.

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***Corresponding author:**
Zahra Lebadi, Department of Educational Sciences, Karaj Branch, Islamic Azad University, Alborz, Iran.

Email: zahra_lebady@yahoo.com

Abstract

Background & Objective: Faculty members are the main stakeholders of the higher education system and play a pivotal role in the performance of universities. Therefore, identifying the entrepreneurial competencies of faculty members could enhance the quality of universities. The present study aimed to propose an entrepreneurial competency development model for faculty members.

Materials & Methods: This was an applied study in terms of objective and an integrated study (qualitative-quantitative) in terms of implementation. The sample population of the qualitative section included 25 university elites, entrepreneurs, professors, and the faculty members of the development and entrepreneurship sectors in the quantitative section. In total, 1,500 participants were selected from universities across Iran. Morgan's table was used to estimate the sample size at 306. In the quantitative section, data were collected using a researcher-made questionnaire, which was developed based on the findings of the qualitative section. The validity of the quantitative section was evaluated and confirmed by face and content validity, and reliability was confirmed using Cronbach's alpha coefficient. Data analysis was performed in SPSS and PLS by open, axial, and selective coding and structural equation modeling.

Results: According to the qualitative findings, the influential factors in the development of entrepreneurial competencies of faculty members included five main categories (entrepreneurial competencies, skills, personal competencies, entrepreneurial facilitators, and intervening factors) and 85 sub-categories. Correspondingly, the entrepreneurial competency model of faculty members was developed, and the results of the quantitative section indicated the good fit of the model.

Conclusion: Entrepreneurial competency of faculty members is a multidimensional and complex framework, affected by several factors such as personal characteristics, skills, cultural background, and organizational structure.

Introduction

Universities are heralds of change and development in every community, playing a key role in the transformation of newfound communities. This role is not limited to research and education, but rather encompasses other areas as well. Therefore, universities should adopt entrepreneurship as a novel approach and an effective strategy to achieve their goals and missions (1).

Faculty members play a key role in the performance of the higher education system and attaining its goals. Identifying and evaluating the competencies of faculty members could increase the quality of universities and contribute to social progress. In addition, competency development is considered essential to evaluating the performance of universities (2).

Competency has been defined variably in the current literature, and these definitions are mainly based on professional roles and responsibilities. According to the definition by Prabavit and Oktariyanda, competency is a set of knowledge, skills, attitudes, and characteristics that set the foundation for the effective management of occupational duties and could be enhanced through education and development (3).

Entrepreneurial competency refers to a combination of essential professional and personal skills and aptitudes and behavioral patterns, which are needed by an individual to achieve success, reach professional goals, and assume responsibilities (4). Based on the evaluation model of entrepreneurs' characteristics, Anwar and Saleem reported the most important characteristics of entrepreneurs to be risk-taking, inner control, urge for success, intellectual power, and pragmatism, tolerance for ambiguity, imagination, and welcoming challenge (5).

Competency models are considered a solution to promote organizational accountability. These models

provide the conditions for success through integrating various skills, abilities, and knowledge, thereby increasing job opportunities in line with organizational strategies and the accountability of organizational managers (6).

The acquisition of knowledge-based competencies will enhance the skills of faculty members, thereby resulting in innovative research and educational performances and the provision of specialized services in universities. Therefore, faculty members must acquire the essential competencies to achieve professional success (7).

To promote the quality of services in different institutions, professional characteristics are developed based on competency to exhibit competent performance in different ways (8). Among global evaluation criteria, entrepreneurial indexes and social efficacy are paramount in guaranteeing the status of universities in the future so that they could accomplish their entrepreneurial and innovative goals in society (9).

In a study in this regard, Pefianco classified the competency standards of teachers in the 21st century in Southeast Asia into four main categories, including learning for knowledge, learning for application, being a learner, and learning for life (10). On the other hand, the study by Hosseini et al. indicated that entrepreneurial capabilities and skills are a major challenge faced by faculty members in terms of professional competency. In Iran, universities are mainly research-oriented, and there are rarely activities regarding the commercialization of research findings and the training of entrepreneurs. As such, attention has not been paid to the identification of entrepreneurial competencies in university graduates, students, personnel, and faculty members (11).

Previous studies have mostly been focused on the educational aspect of competency (i.e., faculty members' teaching), and an inclusive pattern is lacking in this regard. Sangari and Hosseini et al. and Redick et al. have developed and proposed a model of the central competencies of faculty members in different universities (11, 13). Given the research gap regarding the development of entrepreneurial competencies for university faculty members across the country, it is essential to determine the competency components and codify an inclusive model for this concept.

The present study aimed to design, develop, and test an entrepreneurial competency development model to identify the knowledge, skills, characteristics, and qualifications of university faculty members scientifically.

Materials and Methods

This was an integrative study in the qualitative section, and a descriptive survey was also conducted using an exploratory approach. In the qualitative section, 25 academic elites were selected via purposive sampling based on the comments of key theorists via theoretical saturation.

In the qualitative stage, exploratory, we used semi-structured interviews, which were conducted face-to-face and recorded. The duration of each interview was 45-63 minutes, and the interviews continued until reaching theoretical saturation. The recorded interviews were immediately transcribed verbatim, and the most important responses were highlighted.

After extracting the initial codes, we eliminated repetitive, extra, and misleading statements (14). Data were analyzed using microanalysis and by open, axial, and selective coding based on the data foundation theory (15). In line with the research objectives and questions, open coding was employed to identify the codes and initial concepts of the study. In the open coding stage, the interview data were analyzed carefully to determine the main themes and sub-themes, as well as the micro-themes.

The obtained codes from the interview analysis were converted into items and integrated into CVI and CVR tables. A panel of 10 entrepreneurship experts was asked to provide feedback on the proportionality, correlations, ambiguities, and integration of the items. To reach a consensus among the evaluators, the Kappa coefficient was calculated as well. The Kappa coefficient determines content validity and ensures the consensus of experts regarding the lack of probability/chance in the calculated validity (16). Kappa coefficients of higher than 0.74, 0.6-0.74, and lower than 0.6 indicate excellent, good, and poor validity, respectively (17). In the present study, the Kappa coefficient of all the items was higher than 0.7 and considered favorable. In addition, reliability was confirmed at the Cronbach's alpha coefficient of 0.86 in SPSS version 21. Since values above 0.8 are considered acceptable, the reliability of the questionnaire was confirmed (18).

A researcher-made questionnaire was also used for data collection based on the findings of the qualitative stage; the items in this questionnaire were scored based on a five-point Likert scale. The questionnaire consisted of 82 items and five dimensions, including entrepreneurial competencies (18 components), personality competencies (13 components), skills (14 components), facilitators (23 components), and barriers to entrepreneurship (14 components).

In the quantitative stage, the sample population included the administrative faculty members of the entrepreneurship and R&D sections of the universities

affiliated to the Ministry of Health and the Ministry of Science, Research and Technology, and the Islamic Azad University. Morgan's table was used to determine the sample size; to this end, 306 participants were selected from 1,500 faculty members of the entrepreneurship and R&D sections of the universities via stratified, cluster, and random sampling.

Data analysis was performed in SPSS and PLS using inferential statistics (confirmatory factor analysis) and descriptive statistics (frequency, percentage, cumulative percentage, mean, mode, variance, and standard deviation).

Results

In the qualitative stage, five dimensions were identified, including entrepreneurial competencies, personality competencies, skills, facilitators, and barriers to entrepreneurship (Table 1).

Confirmatory factor analysis was used to confirm the qualitative results. In addition, the KMO index and Bartlett's test were used at the significance level of 0.000 and 0.930, respectively. The KMO index of more than 0.7 shows the sufficiency of the sample size. According to the quantitative findings, all the themes obtained from the qualitative content analysis were significant in the factor analysis and were confirmed.

According to the information in Table 2, the factor load of all the measured components was higher than 0.6. Notably, the strength of the correlation between a factor (latent variable) and the discrete variable is measured by the factor load, which is a value within the range of 0-1. If the factor load is lower than 0.3, the correlation is weak and rejected. An acceptable factor load is within the range of 0.3-0.6, while a factor load of higher than 0.6 is highly acceptable.

Table 1: Elements and concepts obtained from qualitative stage interviews

	Main categories	Subcategories	Interview number
Entrepreneurial competencies of faculty members	Entrepreneurial competencies	Managerial competency, competency to identify entrepreneurial opportunities, knowledge competence, innovative competence	1,2,3,4,9,10,11,12
	Skills	Negotiation skills, networking skills, technical skills	6,4,3,2,17,15,14,13,11
	Personality competencies	Responsibility and Commitment to work ,Interest in entrepreneurship and university promotion, Self Confidence, Tolerance of ambiguity, Having critical thinking, Adaptability to circumstances, Hard work and indefatigability, Realism, Resilience in difficult situations, Patience, Risk-taking, punctiliousness and careful consideration	1,2,12,17,13,14,3,4,7,
	Entrepreneurs facilitators	Structural, managerial, organizational culture	2,3,7,9,14,18,13,16
	barriers to entrepreneurship	Research, structural, scientific, financial	1,4,6,6,12,15,7,10

Table 2: Meaning of path coefficient, model of developing effective competencies of faculty members

Structure	Component	Statisticst	The standard deviation	Factor load	AVE	Combined reliability	Cronbach's alpha
Entrepreneurial competencies	Managerial competence	9.11	0.006	0.67	0.83	0.799	0.93

	Competence in identifying entrepreneurial opportunities	8.79	0.005	0.69			
	Competence of knowledge	9.82	0.009	0.80			
	Innovative competence	9.53	0.004	0.76			
	Negotiation skills	0.9	0.007	0.72			
Skills	Networking skills	9.16	0.010	0.63	0/85	0.729	0.92
	Technical skills	9.48	0.016	0.65			

Continue of Table 2: Meaning of path coefficient, model of developing effective competencies of faculty members

	Responsibility and Commitment to work	8.53	0.009	0.63			
	Interest in entrepreneurship	10.17	0.009	0.82			
	Self Confidence	9.56	0.009	0.76			
	Tolerance of ambiguity	9.62	0.004	0.76			
Personality Competencies	Critical Thinking	9.60	0.004	0.76	0.83	0.806	0.91
	Adaptability to conditions	6.69	0.010	0.49			
	Hard work and indefatigability	7.11	0.016	0.51			
	Realism,	6.91	0.004	0.51			
	Resilience in difficult situations,	5.72	0.009	0.41			
	Patience	5.94	0.006	0.43			
	Risk-taking	7.25	0.005	0.54			
	Punctuation and accuracy of opinion	8.17	0.014	0.62			
	Structural	8.87	0.012	0.72			
Facilitating factors	Managerial	10.40	0.011	0.83	0.82	0.833	0.90
	Organizational Culture	8.81	0.006	0.66			
	Research	9.99	0.005	0.28			
Barriers to entrepreneurship	Structural	3.94	0.004	0.76	0.833	0.888	0.89
	Scientific	3.97	0.012	0.81			
	Financial	3.98	0.002	0.82			

According to the results of the significance coefficients, the obtained t values were higher than 1.96 for all the study variables, indicating the significant correlation between these variables with the factors. As can be seen in the table, convergent validity was also calculated, and its average variance extracted (AVE) and composite reliability (CR) were also determined so that:

CR>0.7

CR>AVE

According to the obtained results, the AVE of the constructs was acceptable and higher than 0.5; therefore, convergent validity was confirmed. In addition, the CR value was higher than the AVE. The reliability of the construct (CR=0.81) was also higher than 0.7 for all the hidden variables (constructs), and the Cronbach's alpha of all the variables was also above 0.7. Therefore, the reliability of all the variables was confirmed as well (Cronbach, 1997). To assess compatibility, a theoretical pattern was proposed using the fitness indices of the model (Table 3).

Table 3: Fitness indicators, model related to faculty competency development

Fitness indicators of the measurement model	Level

RMR	0.12
SRMR	0.063
GFI	0.83
NFI	0.92
NNFI	0.95
IFI	0.95
CFI	0.96
RMSEA	0.065

According to the information in Table 3, the research model had a good fit in its entirety since the RMSEA was less than 0.10, and the GFI and NFI were above 0.90. The obtained values indicated that the conceptual research model had a good fit. Since the mean square of errors of the model was below 0.10 and X2/df was <3, the model was observed to have high fitness, implying that the adjusted correlations of the variables were rationally based on the theoretical framework of the study.

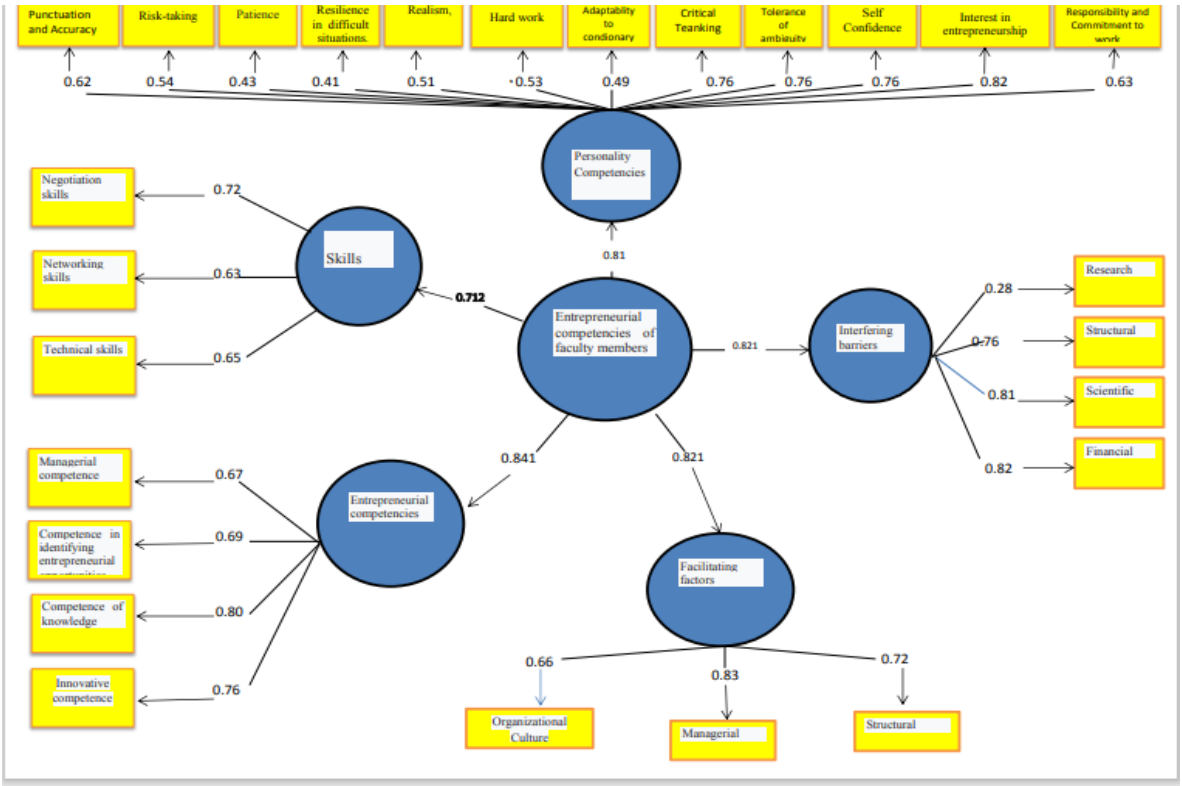

Figure 1: depicts the model of entrepreneurial competency development for faculty members.

Discussion

Entrepreneurial competencies have various dimensions, and the key to achieving this goal is access to the entrepreneurial competencies of university faculty members. The results of the present study highlighted the importance of management competencies as a significant competency of faculty members. Such competency points to the characteristics of entrepreneur faculty members in terms of goal-setting, prioritization, practical planning, reduction management, risk assessment, and decision-making management. These findings are in line with the leadership competency model proposed by Redick, managerial domains and personal indices of Wesselink, and the leadership skills proposed by Rezaeizadeh et al. (13, 19, 20).

Responsibility and commitment are among the other key components of entrepreneurial competencies. In the case of faculty members, these competencies emphasize the characteristics of faculty members that help them persist in their efforts despite challenges in order to initiate, develop, and maintain businesses until

achieving their goals. Furthermore, job commitment diminishes the tendency to leave one's job (21).

Networking abilities, the acceptance of interpersonal differences, and reaching an agreement with stakeholders have been previously mentioned in the literature. Accordingly, communication is a competency that is essential to the success of entrepreneurs. In this regard, Morris et al. emphasize networking skills (22). Furthermore, other researchers such as Rezaeizadeh, Lans, Blok, and Sailing have highlighted the key role of interpersonal relations, which is consistent with the results of the present study (20, 23).

With regard to personality competencies, our findings are consistent with the results obtained by Hosseini and Keshavarz in terms of creativity, innovativeness, risk-taking, self-efficacy, and innovation (11). On the other hand, Mirsapasi, Zamani Moghaddam, and Teymourzadeh introduced the personality competencies of faculty members to be self-adjustment, creativity, innovativeness, compliance with university norms, promoting national identity values, constant learning, sophistication, and personal values; these findings are in line with the results of the present study in terms of self-adjustment, creativity, and innovativeness (24). The findings of the current research indicated that the recognition and promotion of such competencies play a pivotal role in the entrepreneurship of university faculty members.

According to the results of the present study, organizational culture is a facilitator of developing entrepreneurial competencies in faculty members. In a study in this regard, Mohammadi et al. concluded that a solid organizational culture could significantly influence employees' commitment and enhance their behavioral structure. Therefore, emphasis should be placed on cultural components in transformative organizational macroplanning (25). The structural dimension is another facilitator as mentioned in the studies by Kaviani, Malekian, Faramarz, Afrooz, Hassani, Moshabaki, Abolghasemi, Hosseini, and Keshavarz; this is also consistent with the results of the present study (11, 26-28).

With respect to the intervening factors that may affect the entrepreneurial development of faculty members, an undesirable support system plays a key role in this regard. According to the research by Davari et al., a support system is an inherent element of the entrepreneurship ecosystem. Providing these support systems could sustainably mitigate the barriers to the self-realization of entrepreneurs (29). Moreover, Aisenberg considers support systems to be a set of networking institutions, which are aimed at helping entrepreneurs in different stages to develop high-risk businesses. Supporting the creative ideas of faculty members, the activation of technology centers, and establishing knowledge-based companies were among the key findings of the mentioned research, which are consistent with the results obtained by Davari et al. (29). According to the analytical findings of the current research, the indexes and components developed by the researcher were significantly correlated with the components, and the components were significantly correlated with the identified dimensions. Therefore, it could be concluded that the concept of professional entrepreneurship has been properly developed and evaluated and may be confirmed in this regard.

Conclusion

According to the results, faculty members' entrepreneurship is a multidimensional and complex framework, affected by several factors such as the entrepreneurs and their characteristics, management skills and styles, culture, strategies, structure, system, and organization so that these competencies could be developed. Competencies in the members of universities and other academic institutions are a major quality indicator in this regard. Our findings demonstrated that the proposed framework for measuring entrepreneurial competencies, which was suggested in five main dimensions, is an acceptable approach to assess the entrepreneurial competencies of faculty members, as well as their skills, personality competencies, entrepreneurship facilitators, and the intervening factors in academic entrepreneurship.

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