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Article

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Journal of Global Entrepreneurship Research

Provided in Cooperation with:

Springer Nature

Suggested Citation: Khorrami, Mina; Farhadian, Homayon; Abbasi, Enayat (2018) : Determinant competencies for emerging educators' entrepreneurial behavior in the Institute of Agricultural Applied- Scientific Education, Iran, Journal of Global Entrepreneurship Research, ISSN 2251-7316, Springer, Heidelberg, Vol. 8, Iss. 8, pp. 1-11, <https://doi.org/10.1186/s40497-018-0096-4>

This Version is available at:

<https://hdl.handle.net/10419/196942>

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Determinant competencies for emerging educators' entrepreneurial behavior in the Institute of Agricultural Applied- Scientific Education, Iran

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Abstract

Nowadays, entrepreneurship has attracted more attention in the world and is considered one of the new and essential tasks in skill training systems. The present study aimed to investigate determinant competencies of emerging educators' entrepreneurial behavior in the Institute of Agricultural Applied Scientific Education (IAASE). The research was an applied and descriptive correlation study carried out through a survey. The population of the study was composed of 190 faculty members in IAASE in Tehran, Fars, Semnan, Isfahan and Khorasan Razavi provinces, Iran. Using Krejcie and Morgan's (Educ Psychol Meas 30:607-610, 1970) table and proportional to size stratified random sampling method, 123 faculty members were selected as research sample ($n = 123$). The data collecting tool was a questionnaire whose validity was confirmed by a panel of six experts and its reliability was determined by calculating Cronbach's alpha coefficients for different sections between 0.71 and 0.93. Statistical Package for Social Sciences (SPSS) version 18 was used for data analysis. The results of correlation between variables showed a positive and significant relationship between career adaptability, networking skill, occupational self-efficacy, creative thinking, and entrepreneurship climate with educators' entrepreneurial behavior. In addition, the results of hierarchical multiple regression showed that entrepreneurship climate variable was able to adjust the relation between networking skill and career adaptability with educators entrepreneurial behavior. In other words, the educators with highly networking and occupational adaptability skills, in ideal situations, show more entrepreneurial behavior. Finally, in order to improve the current situation, some suggestions are presented to increase the educators' entrepreneurial behavior in agricultural applied scientific institutes.

Keywords: Entrepreneurship, Entrepreneurial behavior competencies, Entrepreneurship climate, Educators, Institute of Agricultural Applied Scientific Education (IAASE)

Background

Due to the international urgent need, entrepreneurship has become one of the new tasks and essential skills in educational systems. Van der Lind (2000) believes that among all skills required by graduates, entrepreneurship is a valuable skill that students should be equipped to cope with the basic challenges, especially unemployment, of the twenty-first century. Entrepreneurship leads to innovation, job creation, human

resource development, and customer satisfaction. But, research shows that only a small percentage of society is engaged in entrepreneurial activities (Bosma et al., 2008). Such evidence has led the researchers to apply social-cognitive models and theories to identify entrepreneurial behavior, in particular in line with planning for youth employment. Therefore, since the decision to become entrepreneur could be reasonable and deliberate and it takes time to make a career, then the entrepreneurial behavior can be considered a kind of planned behavior (Kolvereid and Isaksen, 2006). In the past decade, entrepreneurship and entrepreneurial behavior have become the most important goals of organizations and communities (Onstenk, 2003). Integrated development of entrepreneurship in applied-scientific education is an effective way to increase entrepreneurial behavior in the economy and labor market. Unlike academic education that develops scientific theories, the spirit of applied-scientific education is the practical application of these theories. But, despite the emphasis on the applicability of theoretical sciences and attempts to prepare graduates for entering the job market, applied scientific centers have failed in training skillful graduates (Salehi and Baradaran, 2007). Unemployment of 62% of graduates of these centers is evidence of this claim. Therefore, due to the increase in agricultural students and rising unemployment rate of graduates, agricultural entrepreneurial applied scientific approach can be one of the most important and effective strategies. This kind of education has focused on close cooperation of educational and executive sections in the Ministry of Agriculture in Iran since 1991. Promotion and transfer of knowledge, building job skills in order to increase productivity, and identifying and promoting knowledge and experiences in different jobs constitute the main goals of this kind of education. IAASE has nine departments including animal science, natural resources, water and soil, horticultural science, agricultural science, fisheries and aquaculture, agro-industry, veterinary and technical engineering, agricultural machinery, and planning and development. The institute has more than 27,000 students and more than 45,000 graduates. Currently, applied scientific education has taken an approach towards entrepreneurship and the institute has chosen the “applied scientific education, entrepreneurship education” as its motto.¹

Mohammadzadeh Nasrabadi (2004) and Eskandari (2004) have introduced six main interrelated components of the agricultural higher education system as to be educator, learner, teaching and learning methods, educational content, organization and structure, and principles and philosophy of education. Among these components, educators can affect the other components, and the inattention to their characteristic, skill and competency requirements for the present era disturbs the goals of the educational systems. One of the important competencies for educators, especially in IAASE, is entrepreneurial behavior that is affected by several factors. According to Wheatley (2005), the progression and success of learners depend on having self-efficacy, creative and entrepreneur educators because agricultural educators as facilitators are always at the forefront of training and educating learners and activating their potential forces in the right direction in the agricultural sector. Students, as a huge human capital, will not succeed in their critical roles in the society unless they acquire the necessary knowledge and skills in training centers, and it will not be possible except by the aid of creative educators with entrepreneurial behaviors (Yaghoubi, 2010). Agriculturally creative and entrepreneurial educators also provide an environment in which learners can recognize and foster

their potential aptitudes and develop their own professional and personal abilities appropriately (Schyns & Von Collani, 2002).

Rauch and Frese (2000) argued that a competency-oriented point of view should be adopted in investigations into the factors affecting educator's entrepreneurial behavior. A competency-oriented view focuses on people's competencies which are relevant to successful behavior. Past psychological research has been attribute-oriented. The attribute-oriented approach assumes that the entrepreneurs are born entrepreneur. However, this research methodology has failed to show a strong relationship between personality traits and entrepreneurial success yet. The advantage of the competency-based approach is that competencies are recognized, evaluated and deemed relevant to the action. Unlike the invariability of personality traits, competencies can be developed and can be related to organizational effectiveness (Zahra, 1996). Although most studies have addressed workers in industrial organizations, this study focuses on educators in educational settings (Dickson et al., 2006). Thus, by investigating factors affecting educators' entrepreneurial behavior, this study attempts to introduce appropriate achievements for educators, consultants, and educational planners, to develop suitable entrepreneurship programs, and to improve the effectiveness of education. Educators' entrepreneurial behavior can improve the teaching and learning process and help them to improve their teaching methods. The ability to use new methods and tools, the ability to communicate with the interlocutor in different ways, the ability to set good examples in interacting with individuals, and the ability to manage students' teamwork are examples of this relationship. An educator with an entrepreneurial attitude is passionate about teaching, has a sense of commitment, and helps individuals' learning (Sadler, 2001). Diversity, interest in work, loyalty, enjoyment of teaching, and providing opportunities for learners to learn and use their ideas in teaching and learning process are other characteristics of an educator with entrepreneurial behavior (Rasmussen and Sorheim, 2006).

Various studies have investigated the educators' entrepreneurial behavior. Sadeghi et al. (2008) suggested that self-efficacy is one of the major interpersonal influences on teacher's entrepreneurial behavior in vocational agricultural school in Kermanshah Province, Iran. Barani et al. (2010) investigated the effect of entrepreneurship education on entrepreneurial behavior of industrial engineering students of Payam-Noor University in Kermanshah province, Iran. The results showed a significant and positive correlation between entrepreneurial behavior and students' entrepreneurship attitudes, subjective norms, and self-efficacy.

Lindi (2003) indicated that organizational factors such as management support, reward systems, access time, flexibility, and freedom to work across organizational boundaries all affect entrepreneurial behavior within the organizations. Rasmussen and Sorheim (2006) concluded that growing entrepreneurial characteristics is the requirement of emerging entrepreneurial behavior in environments such as universities. In their study among five Swedish Agricultural University faculty members, they pointed out that expectations and perceptions of the environment affect the students' entrepreneurial characteristics and behavior. In their study among agricultural teachers in five different agricultural schools in the Netherlands, Van Dam et al. (2010) showed that teachers with more entrepreneurial knowledge, career adaptability, creative thinking, occupational self-efficacy, teamwork skills, and networking skills in an appropriate entrepreneurial climate exhibit stronger entrepreneurial behavior.

Based on what was mentioned and adapted from Van Dam et al. (2010), the theoretical framework of the research is shown in Fig. 1. According to the framework, entrepreneurial knowledge, career adaptability, creative thinking, occupational self-efficacy, teamwork skills, and networking skills are entrepreneurial competencies. On the other hand, the perception of entrepreneurial climate is an important component which not only can affect the individual's behavior, but it can also moderate the relationship between educator's entrepreneurial competencies and their behavior.

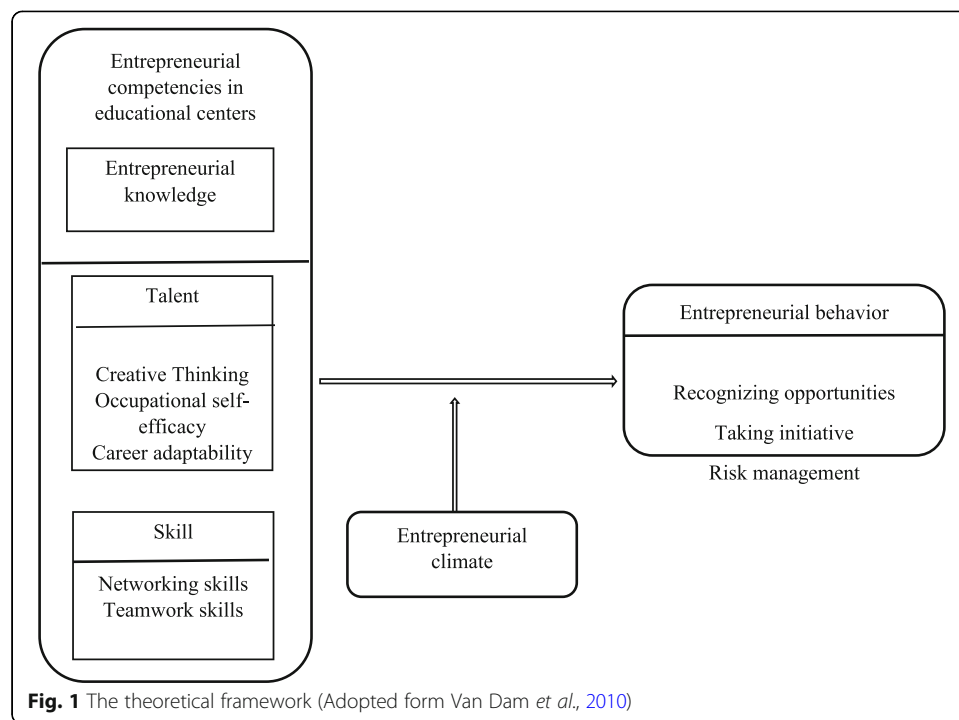
In an educational environment, entrepreneurial knowledge is one of the competencies required for educators. Therefore, to develop entrepreneurial behavior educators need to know what entrepreneurship is and need to understand job market and employment trends in their own field (entrepreneurship knowledge) (Nordhaug & Gronhaug, 1994). In addition, in this changing world in which new demands are always emerging, educators must have the ability to plan and implement work programs and responsibilities and adapt it to new conditions (occupational adaptation). Self-efficacy refers to personal beliefs and is related to entrepreneurship development. Self-efficacy or occupational self-efficacy is associated with positive outputs such as job satisfaction and job performance (Bandura, 1997). To have entrepreneurial behavior, the educators also need to think creatively. They need to think about new ways of doing things and have a strong imagination (creative thinking) (Amabile, 1996). Entrepreneurship in vocational education requires educators to share their knowledge and actively deal with changes in the local market. To achieve these goals, educators should be able to create, maintain and have network behavior (networking skills) (Forett & Dougherty, 2001). Teamwork skill is another entrepreneurship competency. Educators who have more teamwork ability have higher educational and research performance. Teamwork is defined in terms of behaviors, cognitions, and attitudes that make interdependence of performance possible (teamwork skills) (Cannon-Bowers et al., 2009). All these competencies could influence educators' entrepreneurial behavior which is conceptualized as including opportunity recognition, initiative taking, and risk management (entrepreneurial behavior). Of course, not only does the organizational environment of educational centers affect the entrepreneurial behavior, but it can also moderate the relationship between each of the competencies and entrepreneurial behavior (entrepreneurial climate) (Fig. 1).

According to what it was said above, the objectives of the study include:

1. Describing the personal and professional demographics of educators.
2. Examining the relationship between entrepreneurial competencies and entrepreneurial behavior.
3. Examining the impact of the entrepreneurial climate on the relationship between educators' competencies and entrepreneurial behavior.
4. Comparing the educators' entrepreneurial behavior with different personal and professional demographics.

Methods

The present study is a descriptive research in nature, which was conducted through a survey methodology. All of the educators in IAASE in Tehran, Fars, Semnan, Isfahan and Khorasan Razavi Provinces composed the research population of the study ($N =$



190). Using Krejcie & Morgan (1970) 's table and proportional to size stratified random sampling method, 123 educators were selected as the sample ($n = 123$) (Table 1). Questionnaire was the main data collection instrument. The face and content validity of the questionnaire was confirmed by a panel of six agricultural extension and education experts and its reliability was confirmed in a pilot test in Chaharmahal and Bakhtiari Province by calculating Cronbach's alpha coefficient between 0.71 and 0.93 (Table 2). Educator's entrepreneurial behavior of applied-scientific institutions formed the dependent variable, which was examined by three indicators (recognition of the opportunities, initiative taking, and risk management) and 17 items. The independent variables included entrepreneurial knowledge (4 items), career adaptability (9 items), creative thinking (7 items), occupational self-efficiency (6 items), networking skills (6 items), teamwork skills (8 items), and entrepreneurial climate (13 items). All these variables were measured on a five-point Likert scale from 1 (completely disagree) to 5 (completely agree). Environmental climate variable as a moderator variable moderates the relationship between the independent variables and the dependent variable in addition to the direct impact on entrepreneurial behavior. Other variables examined in this study included gender, age, academic rank, teaching experience, employment

Table 1 Population and sample size in each province

Row	Province	Population	Sample
1	Tehran	62	40
2	Isfahan	30	19
3	Semnan	25	16
4	Fars	28	18
5	Khorasan Razavi	45	30
	total	190	123

Table 2 Cronbach's alpha coefficient for variables

Variables	Number of items	Cronbach's alpha values
Entrepreneurial knowledge	4	0.88
Occupational self-efficacy	6	0.83
Creative thinking	7	0.72
Occupational adaptation	9	0.88
Teamwork skills	8	0.79
Networking skills	6	0.90
Entrepreneurial behavior	17	0.71
Entrepreneurial climate	13	0.93
Total	70	0.87

status, personal business situation, previous entrepreneurship experience, and entrepreneurship teaching experience. SPSS software version 18 was used for data analysis.

Results and discussion

Demographic and professional characteristics of respondents

Table 3 shows that 62.6% of respondents were male and 37.4% were female. Among educators, 78.9% were instructor and 21.1% were assistant professor. The mean teaching experiences was 7 years. Regarding previous experience in the field of entrepreneurship, 50.4% had previous experiences. Also, 61% of the educators had experience in entrepreneurship teaching and 39% did not.

Table 3 Descriptive statistics of the respondents

Variable	Label	Frequency	Percentage
Gender	Female	46	37.4
	Male	77	62.6
Age (years)	27–33	36	29.3
	38–47	34	35.9
	48–57	33	26.8
	> 57	10	8
Academic rank	Instructor	97	78.9
	Assistant professor	26	21.1
Teaching experience	1–5	46	37.4
	6–10	60	48.8
	> 10	17	13.8
Employment status	Permanent	92	74.8
	Temporary	16	13
	Other	15	12.2
Personal business situation	Yes	54	43.9
	No	69	56.1
Previous experience in the field of entrepreneurship	Yes	62	50.4
	No	61	49.6
Experience in entrepreneurship teaching	Yes	75	61
	No	48	39

Table 4 Mean and standard deviation of variables

Rows	Components	Variables	Mean ^a	Standard deviation	Rank
1	Entrepreneurial competencies	Entrepreneurship knowledge	3.99	0.81	1
2		Occupational self-efficiency	3.84	0.80	3
3		Creative thinking	3.96	0.85	2
4		Occupational adaptation	3.54	0.86	5
5		Teamwork skills	3.35	0.86	8
6		Networking skills	3.75	0.91	4
7	Entrepreneurial climate	Entrepreneurial atmosphere	3.40	1.06	7
8	Entrepreneurial Behavior	Entrepreneurial Behavior	3.47	0.94	6

^aThe mean range is from (1 = completely disagree to 5 = completely agree)

The mean values and standard deviations for important variables are presented in Table 4. With respect to entrepreneurial competencies, entrepreneurial knowledge was in the first rank (Mean = 3.99) and teamwork skills (Mean = 3.35) was in the last. The mean value was 3.40 for entrepreneurial climate and 3.47 for entrepreneurial behavior.

The relationship between entrepreneurial competencies and entrepreneurial behavior

The results of Pearson correlation between variables are summarized in Table 5. Among the seven variables, occupational adaptation, networking skills and entrepreneurial climate significantly and positively correlated with educators' entrepreneurial behavior. This result is in agreement with the results of earlier researches (Van Dam et al., 2010; Rasmussen & Sorheim, 2006; Lindi, 2003). Entrepreneurial knowledge, occupational self-efficiency, creative thinking and teamwork skills did not correlate with entrepreneurial behavior.

The impact of the entrepreneurial climate on the relationship between educators' competencies and entrepreneurial behavior

To investigate the moderating role of the entrepreneurial climate in the relationship between entrepreneurial competencies and entrepreneurial behavior, a hierarchical multiple regression was used. As it is shown in Table 6, at first step the influence of the independent variables (entrepreneurial competencies and entrepreneurial climate) on the dependent variable (entrepreneurial behavior) was measured and in the second step the influence of the independent variables with a moderating role of entrepreneurial

Table 5 Correlation between variables and entrepreneurial behavior

Row	Variables	Correlation coefficient	Sig.
1	Entrepreneurial knowledge	0.099	0.27
2	Occupational self-efficiency	0.034	0.71
3	Creative thinking	0.090	0.36
4	Occupational adaptation	0.263**	0.00
5	Teamwork skills	0.160	0.07
6	Networking skills	0.318**	0.00
7	Entrepreneurial climate	0.166*	0.05

* $p \leq 0.05$

** $p \leq 0.01$

Table 6 Results of hierarchical regression analysis with entrepreneurial climate as moderator

variables	The first step (β)	Second step (β)
Entrepreneurial knowledge	0.051	0.145
Occupational self-efficiency	-0.017	-0.68
Creative thinking	-0.177	-0.015
Teamwork skills	0.106	0.010
Occupational adaptation	0.210*	0.240*
Networking skills	0.283**	2.438**
Entrepreneurial climate	0.122***	0.124***
Climate \times entrepreneurial knowledge		0.218
Climate \times occupational self-efficiency		1.041
Climate \times creative thinking		-.273
Climate \times teamwork skills		0.123
Climate \times occupational adaptation		0.505**
Climate \times networking skills		3.082**
R^2_{Ad}	0.48	0.50
F	35.46***	18.56***

$p \leq 0.001$: *** $p \leq 0.01$: ** $p \leq 0.05$: *

climate was measured. Based on the results of the first step, networking skills ($\beta = 0.283$, $p \leq 0.01$), occupational adaptation ($\beta = 0.210$, $p \leq 0.05$) and entrepreneurial climate ($\beta = 0.122$, $p \leq 0.001$) are effective in predicting the educators' entrepreneurship behavior. That is to say, having more and wider networks inside and outside the institute, flexibility in professional and job programs and motivational environment will lead to entrepreneurial behavior. Entrepreneurial climate could moderate only the relationship between networking skills ($\beta = 3.082$, $p \leq 0.01$) and occupational adaptation ($\beta = 0.505$, $p \leq 0.01$). Educators with more networking and career adaptability skills have more entrepreneurial behavior when they are in a strong and motivational environment. In addition, entrepreneurial climate has a direct relationship with entrepreneurial behavior ($\beta = 0.124$, $p \leq 0.001$); it means that in the entrepreneurship supportive environments, educators have more entrepreneurial behavior (Table 6).

Table 7 Comparison of entrepreneurial behavior among different groups

Variable	Variable levels	Frequency	Mean	Standard deviation	t	Sig.
Gender	Male	77	56.95	4.30	-0.09	0.92
	Female	46	57.02	3.50		
Academic rank	Instructor	97	56.87	3.86	-0.58	0.10
	Assistant Professor	26	57.38	4.54		
Previous experience in entrepreneurship	Yes	62	57.23	3.91	0.69	0.48
	No	61	56.72	4.11		
Personal business status	Yes	54	57.69	4.03	1.75	0.08
	No	69	56.42	3.92		
Experience in entrepreneurship teaching	Yes	75	57.28	3.77	1.05	0.29
	No	48	56.50	4.34		

Table 8 The effect of employment status on entrepreneurial behavior

Variable	Variable levels	Frequency	Mean rank	Degree of freedom	Chi square	Sig.
Employment status	Official	92	62.35	2	1.17	0.55
	Contractual	16	67.53			
	Other	15	53.93			

Comparison of the educators' entrepreneurial behavior with different personal and professional demographics

Results of t-test show no significant differences in taking entrepreneurial behavior between male and female ($t = -0.09$, $\text{sig} = 0.92$), educators with different academic ranks ($t = -0.58$, $\text{sig} = 0.10$), educators who have previous experience in the field of entrepreneurship and those who do not ($t = 0.69$, $\text{sig} = 0.48$), educators who have their own businesses and those who do not ($t = 1.75$, $\text{sig} = 0.08$), educators who have teaching entrepreneurship experience and those who do not ($t = 1.05$, $\text{sig} = 0.29$) (Table 7). The results also show that educators' employment status has no impact on the occurrence of entrepreneurial behavior ($= 1.17$, $\text{sig} = 0.55$) (Table 8).

Conclusion

Focused on competency-based approach in entrepreneurship education, the aim of this study was to determine the entrepreneurial competencies associated with entrepreneurial behavior of educators in IAASE in Iran. The study provides a competency framework that indicates how corporate entrepreneurship can be facilitated in IAASE. Results partially confirmed the research theoretical model and showed that most studied competencies were not good predictors of entrepreneurial behavior. The findings of Pearson correlation coefficient revealed that occupational adaptation, networking skills, and entrepreneurial climate positively and significantly correlated to educators' entrepreneurial behavior. It means that these skills can be regarded as facilitators of entrepreneurship behaviors. Among the assessed competencies, networking skill and occupational adaptation were related to the entrepreneurial behavior more intensely. This means that more communication network inside and outside the institute and the flexibility and versatility of educators to cope with changing opinions and demands and environmental changes can lead to the entrepreneurial behavior. For entrepreneurship in IAASE, it is important that educators successfully build networks and have proactive perspective against changes. In addition to the importance of individual competencies, this study showed the importance of entrepreneurial climate. Both direct and moderating effect of entrepreneurial climate became clear in emerging entrepreneurship behavior. In a supportive and reinforcing environment, educators showed more entrepreneurial behavior. While it was expected that entrepreneurial climate strengthen the relationship between all individual competencies and entrepreneurial behavior, such effect was found only for networking skill and occupational adaptation. Educators with more networking and adaptability skills showed more entrepreneurial behavior when they were in a powerful entrepreneurial climate. The correlation results are normal to a great extent because, as it was mentioned before, networking and adaptability skills were the only studied individual competencies that had a positive relationship with entrepreneurial behavior. Despite the prediction, no relationship was found between the other competencies (entrepreneurial knowledge, occupational self-efficiency,

creative thinking, and teamwork skills) and entrepreneurial behavior. Educators' inadequate knowledge of entrepreneurship, writing a result-oriented project and the marketing progression in agricultural fields lead to more difficulty in turning to entrepreneurship because it implies dealing with uncertainty and unpredictable developments. As Van Dam et al. (2010) believed about marketing knowledge, an understanding of the demand for a product or service as well as risk management analysis are the crucial knowledge domains that can help the teachers to become active entrepreneurs. In addition, the low level of performance and job satisfaction of educators, lack of support for new ideas in educational centers, the dominance of individualist culture in Iranian organizations, and the desire to do things individually are other reasons for the lack of entrepreneurial behavior by educators. The results of means comparison showed that educators with different gender, previous experience in the field of entrepreneurship, private business situation, and experience in entrepreneurship teaching, employment status and scientific degree showed the same entrepreneurial behavior. This indicates that entrepreneurial behavior is less related to educators' personal and professional characteristics. This study has several implications for IAASE administrations. The results of the study can help the IAASE administrators in the recruitment and retention of educators based on their entrepreneurial qualifications and competencies. In addition, the educators' entrepreneurship competencies should be considered in educators' rewarding system. Also, the educators' entrepreneurship competencies can be improved in different ways. Through numerous programs such as group activities, networking and provision of a work environment that promotes educators to entrepreneurship and implementation of new ideas, educators' networking skills can be promoted. Since the educators' career adaptability is related to their self-confidence about their job skills and risk-taking, their flexibility and versatility can be strengthened by enhancing these features. Also, an appropriate environment can be provided for further development of educators' entrepreneurial behavior in IAASE by strengthening entrepreneurial climate parameters such as management support, time availability, the flexibility of organizational boundaries, work independence, and reward and reinforcement.

Endnotes

¹<http://itvhe.ac.ir>

Acknowledgements

Authors would like to acknowledge the Educators in agricultural applied scientific institutes in Tehran, Fars, Semnan, Isfahan and Khorasan Razavi provinces for completing the research questionnaires.

Funding

The needed funding for the study provided by the Tarbiat Modares University.

Authors' contributions

The authors had contributions in different parts of the manuscript as bellow: Study conception and design: K, F and A. Acquisition of data: K. Analysis and interpretation of data: Khorrami, Farhadian and Abbasi. Drafting of manuscript: Khorrami and Abbasi. Critical revision: Farhadian and Abbasi. All authors read and approved the final manuscript.

Competing interests

The authors declare that they have no competing interests.

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Received: 19 April 2017 Accepted: 6 March 2018

Published online: 07 April 2018

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