
Investigating Barriers and Strategies for Entrepreneurship Education Development: Evidence from Agriculture Scientific & Applied Higher Education Center



Seyed Davood HAJIMIRRAHIMI

Imam Khomeini Higher Education Center, Institution of Technical and Vocational Higher Education of Jihad e Agriculture, Agricultural Research, Education and Extension (AREEO), Tehran, Iran. Email: davood_hajimirrahimi@yahoo.com.

ABSTRACT

This study aims to investigate the barriers and approaches to develop entrepreneurship education in the agriculture scientific-applied higher education center. The present study was done by the survey method, in the target population of the entrepreneurship teachers in the agriculture education centers of Tehran, Alborz, Qom, Semnan and Khorasan Razavi provinces. The research instrument was a questionnaire which its face validity verified by five education and agricultural management experts and its reliability through Cronbach's alpha coefficient. The main results showed that "instability professional competence and function of human and physical resources", "Low-credit instructional content" and "lack of attitude and operational of Alumni and market" factors explained more than 50% of the variance of barriers to the development of entrepreneurship education. On the other hand, three variables including "degree", "level need for increasing knowledge and skills" and "teaching experience in the scientific-applied higher education system has created a significant difference in the view of the subjects. On the other hand, Factors "Promoting economic and market potential students", "Counseling and legal services to students" and "Improving the professional entrepreneurship training unit" have explained more than 62% change in the "development strategies of entrepreneurship training". Also, using training workshop method attended by entrepreneurs, Use the presentation Successful business owners and entrepreneurs in educational center and Visit entrepreneurial companies (3-4 times during the semester) have determined the most important methods of the teaching entrepreneurship.

JEL Classification: L26; L31.

Keywords: Agricultural Higher Education; Entrepreneurship; Scientific; Training; Barriers.

1. INTRODUCTION

Human capital plays a key role in the excellence of countries. This role will further be unveiled thanks to broader studies will be done in future on the effect of human capital on the success of societies, especially when it is consolidated with labor market (Rauch et al, 2011). While natural, production and intangible wealth account for 4%, 18% and 78% of total wealth of the world, respectively; entrepreneurs are responsible for managing intangible wealth (Sepehri, 2009). Pioneer countries and organizations pay attention to the education and empowerment of entrepreneur graduates. In developed countries, higher education centers play a significant role in generating human capital, decreasing human erosion, decreasing unemployment, attracting young people to all sectors including agriculture sector and making them to effectively contribute to them (Katircioglu, 2010; 2008; 2006). They gradually continue this role more effectively through different procedures and flexible education programs. In developing countries, however, this role has not properly been played (Vatankhah and Rezaei Moghaddam, 2015). For example, during 2004-2011 Iranian unemployment rate raised to 12% in Iran (Statistical Center of Iran, 2012).

In Iran, different components of education system try to achieve a common target i.e. educating human resource and continual equipping of it aimed at moving on entrepreneurship road. However, due to some reasons such as lack of deep and operational relationship with agricultural labor market, the system has failed to show a proper effectiveness in creating and developing the creative and entrepreneurial capabilities of graduates (Hajimirrahimi, 2015). According to the results of Savari (2012), the majority of studied agricultural students had a negligible interest to creating small businesses. The study of Zarifian (Zarifian et al, 2015) in Tabriz University showed that 65% of the students of the agricultural faculty of the university are not entrepreneur.

According to them, poor education resources and less concentration on educating creativity, innovation and entrepreneurship are the causes of this failure. On the other hand, the results of Ahmadpour and other's studies (Ahmadpour et al., 2015) on Iranian agricultural education centers showed that the entrepreneurial skills of more than 30% of agricultural students are below moderate level. Therefore, attempts have been done to educate creative, innovative and entrepreneur graduates through establishing applied science education system and implementing entrepreneurship training programs in relevant centers. However, the outcomes of such activities have not sufficient concordance with the targets and inherent philosophy of this system (Zarafshani et al., 2007). There are several questions inducing a kind of confusion to the design and implementation of entrepreneurship programs in agricultural applied science centers such as: "what are the in-organizational and out-organizational barriers of entrepreneurship" and "what are the approaches to developing entrepreneurship education"? "what are the optimal approaches to educating entrepreneurship"? The main problem of this study is these questions.

2. THEORETICAL BACKGROUND

Duke (2003) believes that higher education centers need to establish different departments and communication networks in order to support the development of entrepreneurship education. This is an important and effective factor in economic development, which have received considerable attentions by universities and development authorities in successful developed and developing countries. In the U.S., for example, many universities offer entrepreneurship training courses (Moghimi, 2002) and design and execute different plans for manufacturers, merchants and those who play a role in production-consumption chain. In Germany, the interest of university graduates to self-employment increased from 2% to 9% and the contribution of forced entrepreneurs increased from 1% to 3% (Vesper, 2006). Stuetzer's studies (Stuetzer et al., 2013) showed that entrepreneurship education plays a synergic role to strengthen the effect of job experiences on the development of the entrepreneurial activities of graduates aimed at beginning or developing a business. On the other hand, entrepreneurship education has been identified as one of the most important solutions for increasing the ability and employment capability of higher education graduates (Samwel, 2010).

In addition, the creation of business atmosphere, increasing self-confidence and promoting entrepreneurship behaviors of graduates in society are the outcomes of entrepreneurship education (Unachukwu, 2009). Moreover, participating in entrepreneurship training courses increases entrepreneurship-oriented knowledge and attitude as well as the interest of students to establishing small businesses (Zarifian et al., 2015; Savari et al., 2012). Therefore, formulating plans for developing entrepreneurship education in higher education centers is an inevitable step in the process of the sustainable socio-economic development of societies where creativity, innovation and entrepreneurship remain this sector on continuous growth and evolution axis. The results of Howe's studies (Howe et al., 2015) in Idaho University showed that this university has formulated education programs for promoting the entrepreneurial and risk-bearing capabilities of its production and service authorities in the agriculture sector in order to broaden its effectiveness in the development of the agricultural economy of the region. The results of the plans were repeated for 7 times within 3 years and showed that arranging entrepreneurship training courses for those entrepreneur managers who deal with agricultural product business has had a very positive effect on developing the agricultural economy of the region. On the other hand, the entrepreneurship education programs of higher education centers have a significant effect on broadening the entrepreneurial abilities and wills of students (Bagheri and LopePihie, 2011). Moreover, the studies of European countries and the U.S. showed that entrepreneurship education will increase the capacity of these countries in achieving higher economic growth (Oosterbeek et al., 2009).

Studies on Iran indicate that the philosophy of building applied science education system, the necessity of education innovative and entrepreneur graduates and making them get familiar with labor market and establishing business are the important reasons necessitating the development of entrepreneurship education in applied science higher education centers (Hajimirrahimi and MokhberDezfooli, 2010). Saadi and Soleymani (2013) conducted studies in Abu-Ali-Sina University and showed that participating in entrepreneurship and self-employment courses affects the entrepreneurial capacity of students. In addition, it has a positive and significant effect on students' attitude to entrepreneurship, mental norms and believing self-efficiency (Barani et al., 2009). The results of a study conducted in Shiraz University indicated that the mean creativity of students who participated in entrepreneurship training courses is higher than those who were absent (Vatankhah and Rezaei Moghaddam, 2015). Furthermore, the results indicated that increasing the employment rate of graduates requires developing entrepreneurship education in universities and arranging entrepreneurship courses for agricultural graduates (Gholamrezaei et al., 2013).

There are special barriers in the way of developing entrepreneurship education. Although entrepreneurship centers and entrepreneurs play the main role in European economy, the main challenge of this continent is that entrepreneurship is merely treated as an educational matter instead of an operational one (Survey of entrepreneurship in higher education in Europe, 2008). According to the results of a study in Norway and England, there is a special gap between entrepreneurship literature and the content of entrepreneurship courses and educational programs in the universities of the countries so that there are essential ambiguities which raise these questions: “what are the necessary entrepreneurial abilities of graduates?” and “how the abilities should be educated?” (Rasmussen et al., 2011).

Generally, there are different challenges and barriers in the way of developing entrepreneurship education. Some of them are pointed out as follows: 1) the methodology of the measurement of the effectiveness of entrepreneurship education, 2) the content and education method, 3) the quality of entrepreneurship teachers, 4) accepting entrepreneurship education for business by faculties, 5) creating a general body for different knowledge fields, 6) the effectiveness of education methods and 7) learning needs of working entrepreneurs proportional to the business period they live in (Azizi and Hosseini, 2007). The results of Unachukwu’ study (Unachukwu, 2009) in Nigeria introduced the following items as the main challenges of developing entrepreneurship education: lack of sufficient monetary balance in states and families for investing on entrepreneurship education, weak attitude of managers and ordinary people to entrepreneurship due to the existence of rich mineral resources in Nigeria and lack of capabilities and technologies required for developing entrepreneurship education. On the other hand, Parsley’s results (Parsley, 2010) showed that the dependency of entrepreneurship education on individual attempts (no holistic accountability of managers and professors), allocating no sufficient time to the encouragement and promotion of entrepreneurship education, low quality entrepreneurship teachers and no demand of students for entrepreneurship education are the main barriers of entrepreneurship education in higher education centers.

Although entrepreneurship and its education has been widely developed in the international level (Ahmadpoor Dariani, 2004), it is a new field of science in Iran and the necessity of paying attention to entrepreneurship and educating it in universities has been frequently emphasized. The recent development plans in Iran (the formulation of which has been triggered from 2007), have not put a particular emphasize on the structured development of entrepreneurship so that even by the end of 1990s, it was an unfamiliar concept for many authorities and people. This is why despite the implementation of applied science education system and providing relevant plans and infrastructures in socioeconomic fields and the development of education system for developing and educating entrepreneurship, this concept has been less manifested in the socioeconomic development of Iran. The reports of global entrepreneurship monitor (GEM) indicate the weak position of entrepreneurship in Iran where Iranian entrepreneurship score has been reported less than the scores of Saudi Arabia, Pakistan, Egypt, Azarbaijan, Thailand, Turkey, Philippine and Indonesia (GEM Report, 2013).

Iranian higher education system faces socioeconomic and cultural challenges in the way of entrepreneurship education. Low interest of students to their university disciplines is an important barrier because the majority of students begin to educate in a special discipline via participating in entrance examination without a definite interest and motivation and they lack previous experience for being successful in their discipline, especially in agricultural disciplines. It can be argued, therefore, that empowered students serve as a barrier in the way of developing entrepreneurship education (Karimi et al, 2010). On the other hand, entrepreneurship is the process of developing entrepreneurial attitudes, behaviors and abilities in individual level and this demands education programs proportional to the requirements of labor market on the one hand and the development of the innovation ability of learners in the market on the other hand. However, weak education programs in universities have caused the entrepreneurship and innovation not to be completely included in curriculums and in turn have not created entrepreneurial moral and active and creative brain in graduates. No use of skilled experts as the members of scientific board teaching entrepreneurship, no use of technology in the process of entrepreneurship education, paying no attention to conducting research on entrepreneurship education, mental atmosphere of graduates, no sufficient investment and financial resource for entrepreneurship, No execution or less execution of rules and regulations associated with entrepreneurship development, gap between universities and the industry and the poor social culture of entrepreneurship are among important internal and external barriers of developing entrepreneurship education in Iranian universities (Karimi et al., 2010).

The studies of Parmooze and Movahedi (2014) in Abu-Ali-Sina University showed that the lack of sufficient capitals and resources and paying no attention to educating skills required for future works are the important barriers in the way of developing entrepreneurship education in the studied university.

Rezaei' studies (2011) showed that paying no attention to entrepreneurship in the process of formulating agricultural curriculums and the lack of active consultation departments in agricultural education centers are the most important barriers of developing entrepreneurship education in curriculums. While education plays a significant role in entrepreneurs' performance, the higher education system of agricultural and natural resource fields affect only the acquisition of technical skills and they play a negligible role in acquiring business skills and entrepreneurship activities. In addition, the circumference of business environment does not support entrepreneurial behaviors and inhibits the development and growth of entrepreneurship in the agriculture field (Eskandari et al., 2006). The studies of Pirmardvand Chegini et al., (2014) in Zanjan showed that low quality education and the deficiency of required capital for providing education equipment weaken students' abilities and serve as a hurdle in the way of entering the agriculture market. The results of another study in Razi University showed that different educational, supportive, policy making, information-communication and infrastructure factors serve as the main hurdles in the way of students' entrepreneurship (Arasti et al, 2012).

Principally, paying attention to entrepreneurship and educating graduates equipped with required abilities and skills for establishing a business are among the main tasks of universities. However, Iranian universities have failed to accompany such changes (Maleki, 2005). It can be concluded, therefore, that the identification of the barriers of entrepreneurship education in terms of different internal aspects, such as the weakness of education programs and professors' abilities, and external aspect, such as weak relationship between agricultural higher education and agricultural communities and weak education policies, is of high importance. In European countries, the development of entrepreneurship education in universities has significantly promoted innovation and entrepreneurship culture, assisted people to change their mind and provided them with required skills. The curriculums are rapidly being revised and problem solving teaching method is being used to transfer the knowledge and skill of entrepreneurship. On the other hand, universities have decided to educate entrepreneurship teachers.

In the U.S., entrepreneurship education is associated with conventional businesses available in the market and entrepreneurship professors are generally experienced people in establishing a business. Such professors invite entrepreneur graduates to lecture in entrepreneurship classes (Wilson, 2008). In order to successfully develop entrepreneurship education, the universities of Norway and England have concentrated on educating several competencies including opportunity refinement competency, recognition competencies and attracting/developing labor market through continuous interaction of university entrepreneurship teams with industry partners and costumers (Rasmussen et al., 2011). On the other hand, the existence of the inspiring component is one of the essential requirements of the success of entrepreneurship education programs. Inspiration is a component forming entrepreneurship attitude and intention in graduates and promotes their interest to professional entrepreneurship activities (Sanchez, 2011). According to some studies, the important advantage of this type of educations is the injection of specialized skills proportional to each field of work and this can make graduates more skilled and competent in their job (James, 2005). Therefore, strengthening the process of transferring skill knowledge and labor market knowledge to a set of students' competencies and abilities is the best method of developing entrepreneurship education (Gurel et al., 2010). Thus, higher education centers should put a significant emphasize on educating market indices and entrepreneurial marketing strategies (Karimi et al., 2010).

The evaluation of the content, teaching method and accurate valuation of entrepreneurship curriculum in more than five European and American universities (Stanford, Pensilvania, British, Colombia, Atabska and Maryland) showed that the provided headlines emphasize more on case studies, presenting class seminars by students, team working, and participation in classes, providing a business plan and inviting entrepreneurs to present their opinions. Besides promoting theoretical knowledge, the promotion of individual and group skills have been considered by the universities. On the other hand, they use a combination of mid-term examinations, end-term examinations, team working (seminars), individual works (answering to the questions and quizzes of professors) and class participation for valuation purposes where they more emphasize on practical and team-working aspects. In some cases, however, the end-term examinations are held as open-book examinations (Maleki, 2007).

According to the results of a study carried out in Abu-Ali-Sina University, strengthening the relationship of education content and curriculums with the society and labor market needs is the most important approach to developing entrepreneurship education (Parmoozeh and Movahedi, 2014). Zaridian et al., (2015) showed that the development of entrepreneurship education demands the strengthening of the relationship of "growth and entrepreneurship centers" with students, encouraging students' education groups to take part in different entrepreneurship, creativity and innovation training courses, arranging creativity and innovation in agriculture exhibitions and competitions and introducing entrepreneur students. Mosleh Shirazi (2004) indicated the necessity of making changes in the content and method of presenting education courses.

They indicated that universities and schools should switch towards applied and indirect educations, instead of currently used direct methods, accompanied by new education methods and techniques including role-playing and simulation, in order to transfer concepts and educate required skills. Moreover, some courses such as, business, general management, marketing, creativity, problem solving and entrepreneurship, should be included in the curriculums of all disciplines. Another study showed that correcting education-research system of higher education system in line with educating creativity and entrepreneurship (more concentration of curriculum headlines on entrepreneurship), developing e-education programs associated with entrepreneurship education and arranging training workshops teachers enabling them to get acquainted with entrepreneurship are important approaches to developing entrepreneurship education in the agricultural applied science higher education centers of Kermanshah Province (Maleki and Rostami, 2013). Hoseini et al (2011) indicated the key role of teachers and education context in developing entrepreneurship education in Iranian agricultural and natural resource faculties.

On this basis, it was suggested that the following strategies should be adopted: benefiting from teachers with practical experience in entrepreneurship, strengthening the fundamentals of entrepreneurship and teaching entrepreneurship course. The results of a study carried out in the agricultural applied science higher education centers of Fars Province emphasized that the following approaches should be adopted: “establishing relationships with successful entrepreneurs”, “benefiting from the successful experience of entrepreneurs in establishing a business”, “forming student entrepreneurship teams for creating a positive attitude to performing entrepreneurship activities (Rahmanian Kooshkaki, 2015). In addition, arranging entrepreneurship exhibitions and the visit of student to them, arranging practical workshops of control, supervision, planning, and determining targets in different job steps have been proposed as the most important approaches to developing entrepreneurship education in agricultural faculties (Ahmadpoor et al., 2015). In addition, arranging regular lectures of entrepreneurship teachers in universities with the title of creativity, innovation and entrepreneurship and arranging student seminars in universities for introducing innovations and the results of researches on entrepreneurship have been identified as the most important indices of a developed entrepreneurship education. Moreover, the following items have been introduced as entrepreneurship education methods (Sharifzadeh and Abdollahzade, 2015):

- Working with entrepreneurs as the role models and within professor-student framework
- Strengthening entrepreneurship training and internship courses
- Inviting skilled and successful entrepreneurs to take part in entrepreneurship education courses to transfer their empirical learning (as the invitee trainer and the source of practical learning)
- Providing guidelines and job consultation services and getting familiar to business position in a practical manner.

It can be concluded from the aforementioned studies that Iran should have entrepreneurship education centers and innovative graduates in order to achieve a proper competitive position in international economy. To this end, it should benefit from the experiences of successful countries and localize them in accordance to its special local coordinates. Meanwhile, the applied science higher education system of Iran needs to capture internal structure renovation strategy in order to educate entrepreneur graduates and to realize its existence philosophy. The identification of the barriers of and approaches to entrepreneurship education as well as the methods of entrepreneurship education are the prerequisite conditions for the successfully implementation of this strategy. On this basis, the theoretical framework of study was formulated (Figure 1). This model has two parts. The first part shows the most important factors explaining the barriers of and approaches to developing entrepreneurship education in in-university and out-university fields. The factors are totally affected by the personal and professional traits of the studied cases. The second part shows optimal education (teaching) methods in four main fields: benefiting from entrepreneurs’ experience, formulating job plan by students, implementing creativity techniques and adopting workshop-based problem solving method.

3. METHODOLOGY

This is a descriptive study aims to study the barriers of and approaches to developing entrepreneurship education in agricultural applied science higher education centers as well as the efficient methods of entrepreneurship education. In addition, it is a survey research in terms of data collection method.

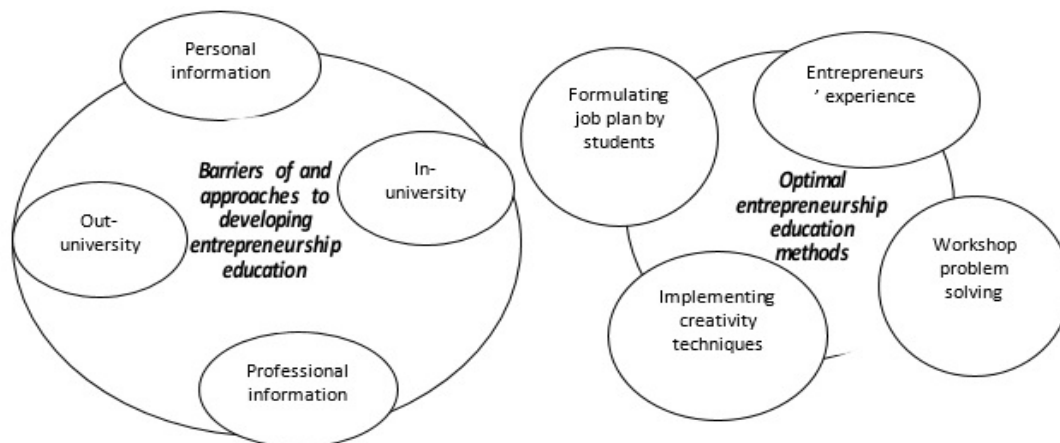


Figure 1.
Conceptual Model

The questions of this study are as follows: what are the barriers of developing entrepreneurship education in agricultural applied science higher education centers? What are the approaches to developing entrepreneurship education in the centers? What are the optimal approaches to educating (teaching) entrepreneurship aiming at the effective transfer of entrepreneurship knowledge and skills to students? Data measurement tool was a questionnaire composed of 4 sections formulated by the review of literature and benefiting from experts' experiences. The four sections were structured as follows: "personal-professional specifications", "barriers of entrepreneurship education (18 items)", "approaches to developing entrepreneurship education (23 items)" and "optimal approaches to educating (teaching) entrepreneurship (14 items)". In order to assure that whether the questionnaire is fit and to confirm its face validity, it was submitted to 5 experts of agricultural education and management.

In addition, Cronbach's alpha was used to confirm its reliability and the derived value was 0.8. The questionnaire items were assessed using Likert scale. The development of entrepreneurship education was conceptually defined as follows: the qualitative and quantitative promotion of entrepreneurship discussions in curriculums and the simplification, facilitation and acceleration of the process of transferring the knowledge, attitude and skill of entrepreneurship to students. The population of study consisted of the professors of the entrepreneurship courses teaching in agricultural applied science higher education centers in Tehran, Semnan, Qom, Razavi Khorasan and Alborz (Imam Khomeini higher education center) Provinces. They were selected by census. The total trials of this study was 24 (n=24).

4. RESULTS AND DISCUSSION

75% of the studied cases had M.S. degree and the remaining 25% had PhD degree. In addition, 62.5% and 16.7% of them were studying in "management" and "the promotion and education of agriculture" disciplinarians, respectively. This indicates the full skill of the majority of responders in entrepreneurship. The teaching background of the majority of cases (85.7%) was > 5 years and that of 47.6% was 10-15 years. This implies that they were completely aware of different educational needs of students, especially the required practical skills in business field. The majority of cases (87.5%) had more than 2 years background in teaching entrepreneurship courses. This adds up the validity of study findings. About 41% of cases had acquired a permit from Applied Science University for teaching entrepreneurship courses. This disputes that whether the majority of them are qualified teachers. On the other hand, 41% of them had not passed entrepreneurship workshop trainings. This may imply their insufficient skill in teaching entrepreneurship courses and in turn the existence of problems in the way of developing entrepreneurship education in agricultural applied science courses.

It should be mentioned, however, that almost 59% of them have participated in one to 5 workshops and only 16.7% of the studied centers have held entrepreneurship education workshops to introduce the approaches of entrepreneurship development in agricultural sector to their teachers. Moreover, 54.2% of them had no business in the labor market of which 20.8% were in the agriculture field. Principally, teachers' experience and their engagement in business and labor market as well as their method of business management significantly help teaching entrepreneurship lesson. It is suggested, therefore, that the familiarity of professors with business and their skill in it should be taken into consideration in the process of selecting teachers for entrepreneurship courses.

On the other hand, the participation rate of teachers in research programs is considerable (66.7%) so that 69.2%, 15.4% and 15.4% of the cases have participated in one project, two projects and three projects, respectively as cooperator or executor. Of the studied cases, 26.1% have presented their results (scientific papers) in the scientific assemblies of entrepreneurship in the form of poster or lecture where 83.3% and 16.7% of them have presented one and two papers, respectively. All studied teachers expressed that they seriously need to participate in entrepreneurship workshops (mean=4 of 5) where more than 37% of them expressed that they seriously need to be educated in this field and to benefit from expert professors in the workshops. The results of a study on the barriers of developing entrepreneurship education showed that the studied barriers contribute more than the mean level (3.72 of 5) to the decreased development of entrepreneurship education (Table 1 in Appendix).

Factor analysis, FA, was used to decrease the number of variables explaining the barriers of developing entrepreneurship education. In addition, Kaiser-Meyer-Olkin (KMO) and Bartlett's tests were used to measure that whether data are fit for FA. The calculated KMO was estimated to be 0.804. Furthermore, with a value of 1632.97, Bartlett's coefficient became significant at a sig. level of 0.000. According to the test results, data are fit to factor analysis. Then, the considered components were determined and the component with the maximum explaining percentage was selected. In this way, six factors were reported using the Eigen Values of primary and final statistics shown in table 2. Kaiser index and variance percentage (VP) were used to determine the number of factors based on which factors with an Eigen value >1 and factors which cumulatively explain more than 70% of VP are selected. Considering the above-mentioned criteria, six factors were selected explaining almost 78% of the VP of "the barriers of developing entrepreneurship education" (Table 2 in Appendix). In the process of explaining the correlation matrix of factors, variables with a factor loading 50%, and more, were correlated with the considered factor in an acceptable significance level (table 3). Considering above data, the variables with acceptable correlation with each factor, or in other words, the variables with a factor loading > 50% were used. Factor rotation was used to simplify the structure of factors, to make them interpretable and to name the factors. The structures of each factor were named in accordance with the results of Table 3 in Appendix. Figure 2 ranks the most important barriers of developing entrepreneurship education in agricultural applied science higher education centers as follows:

- 1) poor entrepreneurial knowledge and skill of professors and managers teaching entrepreneurship course (factor 1 with an Eigen Value of 3.492 explaining 20.54% of the VP of the barriers of developing entrepreneurship education)
- 2) low-credit content (factor 2 with an Eigen value of 2.977 explaining 17.5% of the VP of the barriers of developing entrepreneurship education)
- 3) low-credit courses and curriculums (factor 3 with an Eigen value of 2.1 explaining 12.365% of the VP of the barriers of developing entrepreneurship education)
- 4) Operational and attitude weakness of graduates and market (factor 4 with an Eigen value of 1.699 explaining 9.992% of the VP of the barriers of developing entrepreneurship education)
- 5) Imbalanced capabilities-projects (factor 5 with an Eigen value of 1.542 explaining 9.068% of the VP of the barriers of developing entrepreneurship education) and
- 6) Restricted and tight credits and capabilities (factor 6 with an Eigen value of 1.409 explaining 8.287% of the VP of the barriers of developing entrepreneurship education).

According to variance analyses results, only three variables significantly changed the attitude of cases to the position of each barrier of developing entrepreneurship education. The variables are: "discipline (Sig.=0.01, F=5.05*)", "the extent of the need to promoting one's knowledge and skill for teaching entrepreneurship course more effectively (Sig.=0.01, F=4.86**)" and "teaching background in applied science higher education centers, (Sig.=0.01, F=9.7**). The majority of personal and professional variables did not make a significant change in the cases' attitude. This implies the existence of a kind of agreement on the importance and role of the barriers in inhibiting the development of entrepreneurship education in the studied centers. On the other hand, studies showed that a total number of 23 approaches to developing entrepreneurship education contribute more than the mean level (3.68 of 5) to developing entrepreneurship education (Table 4 in Appendix). This implies that the managers and planners of agricultural applied science higher education centers should use the approaches considering their priorities.

Factor analysis was used to decrease the number of variables explaining approaches to developing entrepreneurship education. The obtained KMO was 0.804 and Bartlett's value was derived 1632.97, which was significant at a sig. level of 0.000 implying that the data are fit to factor analysis.

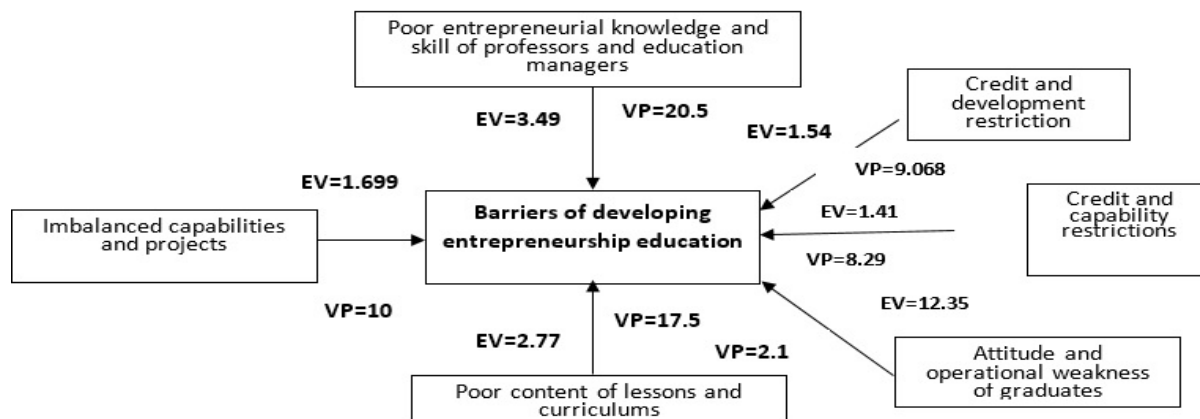


Figure 2.
Factor Distribution of the Barriers of Developing Entrepreneurship Education

Relying on Eigen values and their primary and final statistics, six factors were reported explaining cumulatively more than 88% of the variance of “approaches to developing

entrepreneurship education” (Table 5 in Appendix). To name the factors, variables with acceptable correlation with each factor, or in other words, variables with a factor loading exceeding 50% were used (Table 6 in Appendix). On this basis, factor 1 titled as “promoting the economic and market abilities of students” (Eigen value=6.143), factor 2 titled as “providing students with legal and consultation services” (Eigen value=5.578) and factor 3 titled as “promoting the professional entrepreneurial ability of education unit” (Eigen value=2.717) could explain 11.8% of the variance, respectively. In addition, factor 4 titled as “professional promotion of students’ entrepreneurship” (Eigen value=2.584) could explain 11.23% of the variance and the last two factors titled as “financial support” (Eigen value=1.754) and “publishing specialized journals” (Eigen value=1.501) could explain 7% and 6% of the variance of approaches to developing entrepreneurship education, respectively (Figure 3).

On this basis, considering the necessity of increasing the knowledge and skill of business, labor market and economic discussions was considered as the first priority. The review of variance analysis results indicated that the following four variables made a significant change in the attitude of cases to the approaches to developing entrepreneurship education: “the extent of contribution to the formulation and execution of research projects in the field of entrepreneurship” (Sig.=0.01, F=11.85**), “background in teaching entrepreneurship course” (Sig.=0.05, F=3.53*), “number of entrepreneurship training courses passed by cases” (Sig.=0.001, F=7.8**) and “the necessity of teaching entrepreneurship in different education levels” (Sig.=0.01, F=6.3**).

Addressing the dimensions of improving entrepreneurship education method is one of the most important approaches to developing entrepreneurship education in agricultural applied science higher education system because improved methods of teaching and transferring entrepreneurship knowledge and skill to students lead to promoted education quality. This in turn promotes graduates’ entrepreneurial abilities. According to Table 7 in Appendix, of the studied approaches, 17 ones contribute more than mean level to improving entrepreneurship education methods (3.71 of 5). Factor analysis was used to decrease the number of variables explaining approaches to improving methods of teaching entrepreneurship. According to the results of KMO (KMO=0.804) and Bartlett’s (value=1632.97) tests, the data are fit to factor analysis. A total number of 5 factors were reported using Eigen values and primary and final statistics (Table 8 in Appendix). The factors cumulatively explained more than 70% of the variance of “optimal approaches to entrepreneurship education”. To evaluate correlation matrix of factors, variables with a factor loading of 50% and more were taken into account in an acceptable significance level (Table 9 in Appendix).

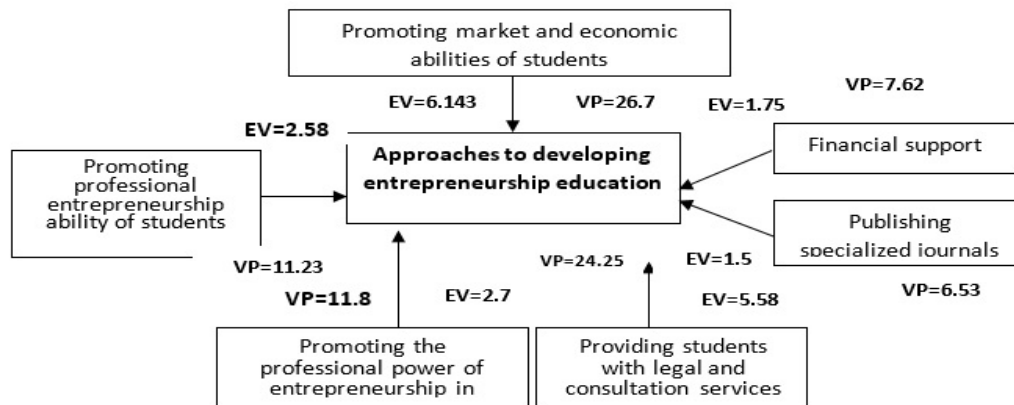


Figure 3.
Factor Distribution of Approaches to Developing Entrepreneurship Education

To simplify factor structures and to make them interpretable, the structures of each factor were named. Factor 1 titled as “research on and capability of formulating business plans” (Eigen value=3.677), factor 2 titled as “training workshops attended by entrepreneurs” (Eigen Value=2.66), factor 3 titled as “transferring entrepreneurs’ experience” (Eigen value=2.056), factor 4 titled as “active learning” (Eigen value=1.846) and factor 5 titled as “visiting entrepreneurship activities” (Eigen value=1.466) explained 23%, 14%, 12.847%, 11% and 9% of the variance of the variable of optimal approaches to entrepreneurship education (Figure 3).

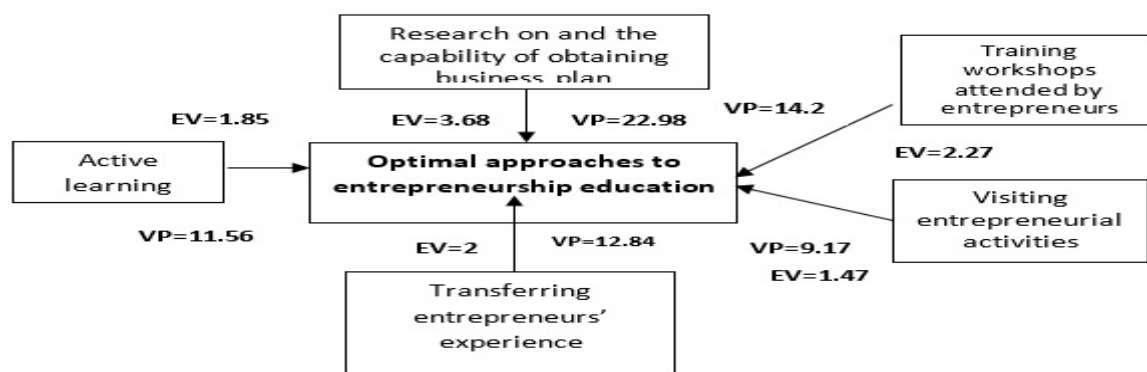


Figure 3.
Factor Distribution of Approaches to Optimal Entrepreneurship Education

The investigation of the effect of personal-professional traits of cases on their attitude to the optimal approaches to entrepreneurship education showed that four variables made a significant change in their attitude as follows: 1) “education level “ (Sig.=0.05, F=2.23**), 2) “establishing a business” (Sig.=0.05, F=3.53**), 3) “number of entrepreneurship training courses passed by cases” (Sig.=0.01, F=3.9**) and 4) “the necessity of teaching entrepreneurship in different education levels” (Sig.=0.01, F=4.65**).

5. CONCLUSION

Research goals were investigating the barriers and approaches to develop entrepreneurship education in the agriculture scientific-applied higher education center. According to the results of this study, the studied barriers contribute more than mean level to decelerating the development of entrepreneurship education. However, the most important factors explaining the barriers of entrepreneurship development in applied science educations are ranked in the following order:

- Poor entrepreneurial skill and knowledge of professors and education managers
- Low-credit of the content of courses and curriculums

- Operational and attitude weakness of graduates and the market
- Imbalanced capabilities and projects
- Restricted credits and facilities

According to the findings, unlike the initial statements of some authorities who give priority of the effect of low credits and insufficient education capabilities on decelerating entrepreneurship education, the poor technical and professional abilities of teachers and managers as well as poor entrepreneurship curriculums rank the first. The findings do not agree with the results of Yaghoobi and Hosseini (2006) but agrees with the results of Unachukwu (2009). The results of Rasmussen et al., (2001) showed the problem of treating with entrepreneurship in a non-applied manner in some European countries. In addition, the results of Karimi (2010) and Parsley (2010) showed the low quality of entrepreneurship teachers and the results of Parmoozeh and Movahedi (2004) showed the lack of sufficient resource and capitals for entrepreneurship education and paying no attention to required skills in future. It can be argued, therefore, that a kind of concordance is seen between our results and the above-mentioned results. Such results, which do not agree with some researchers conducted beyond applied science education borders, were derived due to two reasons:

- 1) The lack of comprehensive plans for educating teachers with the ability of teaching entrepreneurship in applied science courses and benefiting from professors who teach within the frameworks of conventional theoretical academic method, and
- 2) The lack of appropriate capabilities for teaching entrepreneurship in an applied science manner.

It should be mentioned however, that the main differences is seen in priorities and there is no significant differences in the generalities. Another part of this study showed that the following items are the most important factors explaining approaches to developing entrepreneurship education:

- Promoting economic and market abilities of graduates
- Providing entrepreneurs with consulting and legal services
- Professional promotion of the entrepreneurial ability of learners
- Providing financial supports for entrepreneurs
- Publishing specialized journals

These findings agree with the results of Sanchez (2011), Rauch et al (2011), Parmoozeh and Movahedi (2014), Sharifzadeh and Abdollahzadeh (2015) and Zarifian et al (2015). However, they disagree with the results of Wilson (2008) where the priority is the revise of curriculums and education methods of entrepreneurship teachers and adopting innovative teaching methods such as problem-solving method for transferring entrepreneurship knowledge and skill. Regarding the necessity of benefiting from professors who are experienced in their job and business for teaching entrepreneurship course, the results of this study agree with those of Hosseini et al (2011). This indicates the importance of the practical familiarity of entrepreneurship teachers with the labor market of agriculture sector and their direct attendance in the economic processes of labor market. Considering the results of this study and relevant interpretations, the following suggestions are put forward:

- 1) More than 40% of entrepreneurship professors have not participated in special training courses and have not acquired official permit from Applied Science University for teaching entrepreneurship. In addition, they are not entrepreneurship experts. Therefore, the poor entrepreneurship knowledge of such professors and education managements was recognized as the main barrier of developing entrepreneurship education. To this end, the practical and educational abilities of the professors should be promoted through short-term, mid-term and long-term programs in order to develop entrepreneurship education. This suggestion is supported by the fact that the need of the studied professors for participating in training workshops, presented by experienced professors, was indicated very high.

- 2) The majority of the studied professors lacked a business. Therefore, it is suggested that professors who deal with a business in agricultural labor market should preferably be used for teaching entrepreneurship. In addition, they should be qualified professors for teaching entrepreneurship with sufficient practical familiarity with the labor market of this sector.
- 3) It is suggested that, necessary capabilities and facilities for acquiring occupational and practical skills by students should be built in the education spaces of applied science higher education centers including “technology parks”, “entrepreneurship growth centers”, “specialized clinic of agriculture” and “consultation clinics”.
- 4) Considering the low-credit of education contents and curriculums, a committee composed of entrepreneurship experts and experts of education planning for applied science courses should be formed in order to make continuous changes in the content of entrepreneurship course and to promote the credit of it.
- 5) Techniques for creating the ability of formulating business plan in students and transferring entrepreneurs’ experience to students should be used for optimizing entrepreneurship education.
- 6) Applied Science University should follow the continual state supports provided to entrepreneur students.
- 7) A comprehensive plan should be formulated to develop researches on the continual development of innovative entrepreneurship education in agricultural applied science higher education centers. In addition, a fit education-research system should be designed for this purpose.

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APPENDIX

Table 1. Statistical Distribution

barriers	mean	STD	Coefficient of variations
Current problems of Iran in the way of developing entrepreneurship activities	4.37	0.71	0.162
Insufficient credit of education centers for developing students' entrepreneurship activities	4.25	0.74	0.174
Unfamiliarity of different course professors with entrepreneurship and paying no attention to it during teaching	3.87	0.80	0.2
Poor quality of technical and specialized abilities of graduates	3.75	0.79	0.21
Impossibility of the manifestation of graduates' creativity and entrepreneurship	3.75	0.79	0.21
Inefficient entrepreneurship professors	3.71	0.86	0.232
The weakness education center managers in understanding the concept of entrepreneurship and adhering to expanding it in curriculums	3.71	0.86	0.232
Lack of research projects in the entrepreneurship field	3.54	0.83	0.234
Entrepreneurship course is not treated in an specialized manner	3.96	0.95	0.24
Entrepreneurship course is taught in a non-applied manner	3.71	0.91	0.245
Lack of complete coordination between the content of the applied science higher education system and the features of graduates' abilities expected by the labor market	3.92	0.97	0.247
Poor content of the headlines of specialized courses	3.54	0.88	0.249
Student projects for realizing entrepreneurship thoughts are not target-oriented	3.67	0.92	0.25
Inefficient content of entrepreneurship course	3.5	1	0.286
Lack of sufficiently motivated students ready to enter entrepreneurship arena	3.87	1.12	0.29
Insufficient capabilities of education centers	3.33	1.09	0.328
Students' diploma degree is not proportional to their applied science discipline	3.17	1.27	0.4
No trust of economic and market practitioners in students' technical abilities	3.46	1.38	0.4
mean			3.72

Table 2. Eigen Value of the VP

Factor	Eigen Value	VP	Cumulative percent
Factor 1	3.492	20.541	20.541
Factor 2	2.977	17.512	38.053
Factor 3	2.100	12.355	50.407
Factor 4	1.699	9.992	60.399
Factor 5	1.542	9.068	69.468
Factor 6	1.409	8.287	77.754

Table 3. Correlation Matrix of the Factors Explaining “the Barriers of Developing Entrepreneurship” After Factor Rotation

Variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Inefficient content of entrepreneurship course	.396	.691	-.017	-.103	-.051	.194
Entrepreneurship course is not treated in an specialized manner	.430	-.071	.247	-.077	.626	-.237
Current problems of Iran in the way of developing entrepreneurship activities	-.248	.142	.072	-.003	.826	.109
Poor content of the headlines of specialized courses	.462	.707	-.380	.107	-.063	-.017
Inefficient entrepreneurship professors compared with standard level	.816	.214	-.097	.283	-.147	-.037
Insufficient capabilities of education centers	.521	.465	-.077	.331	-.145	.394
Lack of research projects in the entrepreneurship field	.110	.169	.160	.828	.258	.256
The weakness of the managers of education centers in understanding the concept of entrepreneurship and adhering to expanding it in curriculums	.865	.064	.048	.101	.129	.255
Insufficient credit of education centers for developing students’ entrepreneurship activities	.040	.077	-.073	-.033	-.005	.868
Lack of sufficiently motivated students ready to enter entrepreneurship arena	-.019	.233	.774	-.015	.066	-.226
Lack of complete coordination between the content of the applied science higher education system and the features of graduates’ abilities expected by the labor market	-.042	.714	-.012	.135	.368	-.255
Students’ diploma degree is not proportional to their applied science discipline	-.048	.087	.105	-.822	.267	.289
Unfamiliarity of different course professors with entrepreneurship and paying no attention to it during teaching	.858	.123	.169	-.099	-.095	-.110
Entrepreneurship course is taught in a non-applied manner	.383	.532	.427	-.064	-.282	.088
Poor quality of technical and specialist abilities of graduates	.010	.807	.300	.027	.092	.185
Impossibility of the manifestation of graduates’ creativity and entrepreneurship	.010	.807	.300	.027	.092	.185
Student projects for realizing entrepreneurship thoughts are not target-oriented	.535	.346	.528	-.254	.066	-.020
No trust of economic and market practitioners in students’ technical abilities	.061	-.184	.807	.100	.147	.089

Table 4. Statistical Distribution of Approaches to Developing Entrepreneurship Education

Approach	Mean	STD	Coefficient of variation
Providing students with business skill acquisition opportunities	4.18	1.07	0.259

Establishing entrepreneurship offices in education centers and encouraging team entrepreneurship activities	4	1.06	0.265
Arranging marketing and merchandising training courses for students	3.82	1.07	0.28
Arranging entrepreneurship education workshops for specialized and core course professors as well as for the relevant authorities of disciplinarians	4.18	1.18	0.282
Arranging "introduction of trading principle" courses for students	3.71	1.05	0.283
Establishing student assembly of entrepreneurship	3.41	1.06	0.31
Inclusion of free idea-making discussions in different applied science courses	3.59	1.12	0.312
Arranging creativity education courses	3.94	1.25	0.317
Arranging national, province and regional seminars for providing new ideas in scientific arenas	3.47	1.12	0.323
Providing students with consultation services (consultation clinics) for developing their entrepreneurial abilities	3.88	1.27	0.327
Publishing entrepreneurship journals in agricultural sector	3.53	1.19	0.337
Arranging "Internet applications in economic affairs" courses for students	3.29	1.10	0.334
Arranging national seasonal or semiannual exhibitions about students' entrepreneurship projects	3.44	1.15	0.334
Predicting separate sufficient credits for education centers for entrepreneurship education purposes	3.87	1.31	0.339
Promoting the position of entrepreneurship course among general, core and specialized courses	3.69	1.30	0.352
Benefiting from qualified and skilled professors for teaching entrepreneurship course	4.06	1.43	0.352
Arranging "research on market activities and business creation and development" training courses for students	3.62	1.36	0.356
Benefiting from entrepreneurs for teaching entrepreneurship course provided that they have required university degree	3.76	1.35	0.359
Arranging "general and professional short-term" training courses for students in addition to their conventional courses	3.41	1.23	0.36
Legal and continual support of government from entrepreneur students	3.94	1.43	0.363
Legal decrease of tuition for entrepreneur students	3.23	1.30	0.4
Providing permanent physical spaces for student enabling them to show entrepreneurship projects	3.41	1.42	0.416
Addition of the headline of formulating an entrepreneurship project to some of specialized courses of agricultural applied science disciplinarians	3.18	1.47	0.462
Mean			3.86

Table 5. Eigen Values of the VP of Factors of Approaches to Developing Entrepreneurship Education

Factor	Eigen value	VP	Cumulative percent
Factor 1	6.143	26.708	26.708
Factor 2	5.578	24.253	50.962
Factor 3	2.717	11.813	62.775
Factor 4	2.584	11.233	74.008
Factor 5	1.754	7.624	81.632
Factor 6	1.501	6.527	88.159

Table 6. Correlation Matrix of the Variables of Approaches to Developing Entrepreneurship Education after Factor Rotation

variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Publishing entrepreneurship journals in agricultural sector	-.078	-.004	0.242	0.20	-.080	.949

variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Addition of the headline of formulating an entrepreneurship project to some of specialized courses of agricultural applied science disciplinarians	.547	.393	-.053	.609	-.098041	-
Establishing entrepreneurship offices in education centers and encouraging team entrepreneurship activities	-.236	-.189	.522	.248	-.417	.230
Arranging “general and professional short-term” training courses for students in addition to their conventional courses	.545	-.165	.085	.753	.027	-.074
Providing students with business skill acquisition opportunities	-.147	.023		.954	.045	.090
Providing students with consultation services (consultation clinics) for developing their entrepreneurial abilities	.086	.742	-.028	.493	.111	-.284
Arranging “Internet applications in economic affairs” training courses for students	.787	.402	.084	.120	-.208	-.192
Arranging “ introduction of trading principle” training courses for students	.706	.488	-.141	-.175	.227	.128
Arranging “marketing and merchandising principles” training courses for students	.577	.691	-.106	-.026	-.294	-.191
Arranging “research on market activities and business creation and development” training courses for students	.798	.373	-.030	.043	-.350	-.089
Arranging national seasonal or semiannual exhibitions about students’ entrepreneurship projects	.369	.794	-.142	.118	.020	.164
Predicting separate sufficient credits for education centers for entrepreneurship education purposes	.018	.001	.385	.114	.872	-.082
Promoting the position of entrepreneurship course among general, core and specialized courses	.485	-.036	.648	.291	.246	.030
Inclusion of free idea-making discussions in different applied science courses	.310	.760	.268	.276	-.286	-.121
Arranging entrepreneurship education workshops for specialized and core course professors as well as for the relevant authorities of disciplinarians	.165	.185	.831	.046	.220	-.073
Benefiting from qualified and skilled professors for teaching entrepreneurship course	.612	.610	.180	.086	.066	-.319
Establishing student assembly of entrepreneurship	.819	.416	.145	.258	.126	.128
Legal decrease of tuition for entrepreneur students	.890	.159	-.025	.159	.070	-.124
Providing permanent physical spaces for students enabling them to show entrepreneurship projects	.874	.065	.162	-.096	.220	.002

variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6
Legal and continual support of states from entrepreneur students	.458	.667	-.119	-.027	.324	.102
Arranging national, province and regional seminars for providing new ideas in scientific arenas	-.105	.060	.870	-.033	.058	.386
Arranging "creativity education" training courses	.114	.927	.085	-.123	-.089	.071
Benefiting from entrepreneurs for teaching entrepreneurship course provided that they have required university degree	.194	.809	.318	-.258	.320	-.042

Table 7. Statistical Distribution of Optimal Approaches to Entrepreneurship Education

Approach	Mean	STD	Coefficient of variation
Arranging workshops attended by entrepreneurs	4.46	0.51	0.114
Lecture of successful business owners and entrepreneurs in education centers	4.5	0.66	0.147
Visiting entrepreneur companies (3 to 4 times within an education term)	4.17	0.64	0.153
Encouraging students to investigate and research available and new jobs in their discipline	4.17	0.70	0.167
Paying attention to the creative and entrepreneurial abilities of students of primary, guidance and high schools	4.25	0.74	0.174
Providing brochures reflecting the real life and occupational life of the entrepreneurs of agriculture sector and giving the results to students to study and analyze them in classes	3.96	0.69	0.174
Displaying training movies of Iranian and non-Iranian entrepreneurs in classrooms	4.04	0.75	0.186
Conducting case studies on business units and entrepreneurs and presenting the obtained results in classes	4.29	0.95	0.221
Providing students with the real facts of labor market	3.92	0.88	0.224
Continuous use of audiovisual capabilities for displaying the procedures followed by successful entrepreneurs and entrepreneurship units	3.83	0.87	0.227
Participation of students in teaching process	3.83	0.87	0.227
Encouraging and training students to design job plans associated with developing one of available jobs or creating a new job in their professional discipline	3.87	1.03	0.226
Arranging class discussions about entrepreneurial businesses	3.48	1.16	0.333
Designing posters for small businesses and utilizing them	3.08	1.10	0.357
Mean			3.71

Table 8. Eigen Value and VP of Factors Explaining Optimal Approaches to Entrepreneurship Education

Factor	Eigen value	VP	Cumulative percent
Factor 1	3.677	22.980	22.980
Factor 2	2.266	14.161	37.141
Factor 3	2.056	12.847	49.988
Factor 4	1.846	11.535	61.523
Factor 5	1.466	9.165	70.668

Table 9. Correlation Matrix of the Variables of Approaches to Optimal Entrepreneurship Education

variable	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
Conducting case studies on business units and entrepreneurs and presenting the obtained results in classrooms	.699	.215	.215	-3.91	.138
Lecture of successful business owners and entrepreneurs in education centers	-.037	.032	.844	-.026	-.085
Arranging workshops attended by entrepreneurs	.276	.535	.203	.043	-.196
Visiting entrepreneur companies (3 to 4 times within an education term)	.080	.024	.097	.084	.914
Designing posters for small businesses and utilizing them	.537	.586	-.195	.285	.005
Arranging class discussions about entrepreneurial businesses	.810	.063	.111	.330	-.190
Encouraging and training students to design job plans associated with developing one of available jobs or creating a new job in their professional discipline	.818	-.017	-.048	.235	.071
Continuous use of audiovisual capabilities for displaying the procedures followed by successful entrepreneurs and entrepreneurship units	.385	.251	-.197	.545	.324
Participation of students in teaching process	-.009	.060	.222	.881	.051
Providing students with real facts of labor market	.835	.378	-.025	.039	.036
Encouraging students to investigate and research available and new jobs in their discipline	.308	.246	..497	.396	.076
Providing brochures reflecting the real life and occupational life of the entrepreneurs of agriculture sector and giving the results to students to study and analyze them in class	.062	.565	.411	.150	.477
Displaying training movies of Iranian and non-Iranian entrepreneurs in classes	.110	.106	.783	.024	.257
Paying attention to the creativity and entrepreneurial abilities of students in primary, guidance and high schools	.017	.717	.165	-.085	.258

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