

Validation of a Scale for Measuring Entrepreneurship of University Students

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Abstract

The main purpose of the present research is to do a survey on the components of students' entrepreneurship in universities and to study the construct validity of the researcher-made entrepreneurship questionnaire. The population included the whole MA students (in zones 8 and 12) in 18 branches of Islamic Azad University in Iran. The participants of the study are comprised of 1922 students who were selected by cluster random sampling method. The instrument was a researcher-made entrepreneurship questionnaire which consisted of 58 items with dimensions of need for progress, locus of control, tendency toward risk-taking, need for independence, creativity, competitiveness, self-confidence, being realistic, persistency, time management, openness to criticism, being vivacious, and being purposeful ($\alpha = 0.86$). The results of factor analysis and principal component analysis, using a varimax rotation, indicated that the factors which constitute the students' entrepreneurship in universities consisted of tendency toward risk-taking (Items 53, and 54), need for independence (Items 55, and 58), creativity (Items 14, 15, and 16), competitiveness (Items 7, 8, 9, 10, and 11), being realistic (Items 36, 37, and 38), time management (Items 20, 22, 25, 33, 41, 45, 47, and 51) , and being vivacious (Items 27, 43, and 49). The time management dimension was the most effective factor in students' entrepreneurship. The need for independence dimension was the least effective factor in students' entrepreneurship.

Keywords: Students' entrepreneurship, Validity, Principal component analysis, Varimax rotation

Introduction

Entrepreneurship has been considered as an important subject by the researchers in the field of economics and management in the whole world [1]. The importance of research in entrepreneurship is due to some factors. In the developed countries, the entrepreneurial activities have been used as a tool for reviving the stagnated economy and solving the unemployment problem through creating new opportunities. In addition, entrepreneurship facilitates the innovation and technological development of the product [2]. Nowadays, university students and graduates know that they are supposed to join a work place that is varied, dynamic, and complicated. Factors like globalization, competition, and the rapid growth of technology have changed the work condition. Hence, employers' expectations have changed and they need the employees who have entrepreneurial attitude [3].

Literature review

The entrepreneur is a person who organizes, accepts, manages, and has commitment to the dangers of an economic activity. He also pinpoints a chance and in order to take it, he establishes an organization. The process of entrepreneurship includes all duties, activities, and operations related to the pinpointing of the chance and establishing an organization in order to take such chances [4]. Stevenson, et al. believe that entrepreneurship consists of a process in which people follow some chances (for either themselves or their organizations) regardless of the resources, which are under their control [5]. However, the common aspects of entrepreneurs are as follows: risk-taking (measured risks), need for progress, locus of control, innovation, creativity, thinking of new ideas, self-confidence, hardworking, idealism, initiation, taking opportunities, goal orientation practicality and future centeredness. On the contrary, to those who are against any kind of new ideas, entrepreneurs develop new ideas in the organization based on their open mindedness and creative and positive thought [6].

According to the experts in the related field, entrepreneurs have various characteristics; some of these characteristics have been defined as follows:

1. The need for progress: “The need for progress” consists of tendency toward doing jobs in high standard level in order to succeed in comparative situations [7].

2. The locus of control: Successful entrepreneurs believe in themselves, they do not think their success or failure is as a result of their destiny, good/bad luck, or other similar powers. They believe that failures and advancements are under their control, and they can affect the results of their performance [8].

3. Tendency toward risk-taking: It refers to the moderate risks that can be controlled through personal attempts. Facing any kind of risk, two elements play role in creation of this concept, the first element is the extent that the entrepreneur understands the risk, and the second element is the probability of failure in case of doing unsuccessful activity [9].

4. The need for independence: This element has been emphasized as a very stimulating power. In fact, the need for independence can be defined as: “control over one’s destiny”, “doing something for oneself”, “being the master of oneself” [10].

5. Creativity: It refers to the ability of creating new ideas which may lead to new products or services [11].

6. Competitiveness: Ability of an organization to offer services at prices that are competitive and provide enough returns on the resources used in producing them [12].

7. Self confidence: It means how secure a person is in their own decisions and actions (Wikipedia).

8. Being realistic: It means willing to see things as they really are and deal with them sensibly [13].

9. Persistency: It refers to the state of being insistent or uninterrupted existence or succession [14].

10. Time management: It means you control your time and work and do not let those affairs and events handle you [15].

11. Open to criticism: The word criticism means looking for or pointing out faults (Oxford Dictionary). Therefore, open to criticism is defined as a characteristic to accept others’ opinions about one’s faults.

12. Being Vivacious: It means the quality or state of being lively in temper or conduct [16].

13. Being purposeful: It means having a purpose or aim. It also means being full of determination [16].

Azizi (2003) investigated the backgrounds of emerging and training entrepreneurship in university students and showed that there is significant relationship between entrepreneurship and the variables of the degree of tolerance, trust in locus of control, the need for progress, risk-taking, creativity and innovation tendency towards independence. [17] Sharifzadeh (2004) has identified the educational needs of university students in the field agriculture by investigating four characteristics of tendency towards success, power, competition and risk-taking in order to strengthen these attributes. The findings of the study show that students who have tendency towards competition enjoy greater degree of tendency towards power and risk-taking [18]. In a research, Haddad Adel (2000) found that in the entrepreneurship group, need for progress, independence, tendency towards creativity, risk-taking and determination are significantly more than the non-entrepreneurship group [19]. The results of a research done by Kuratko & Lhodgetts (2001) shows that organizational specifications like management support, independence (freedom at work), giving opportunity, and the individual specifications like risk-taking, need for independence, tendency towards success and aim, the locus of control raise entrepreneurship in organizations [20].

In his study, Koh (1996) referred to creativity, tolerance of ambiguity, risk-taking, need for progress, locus of control and self-confidence as the characteristics of entrepreneurs [21]. Helm (2007) considered the factors of creativity and risk [22]. Also Gürol (2006) in his research report enumerated their characteristics as follows: tolerance of ambiguity, self-confidence, risk-taking, internal center of control, need for progress [23]. Moreover, in further researches done by Hildebrando (2003) and Kamalanabehan (2006), they ended up with these characteristics for entrepreneurs: risk-taking, creativity, need for progress [24,25]. Gillian, et al. (2002) mentioned creativity and risk-taking are the major features [26]. Argenti listed the factors like providence, determination which provides energy and motivation, mental concentration to carefully determine the details of schedules and match sources with goal, persistence and enthusiasm [27].

In the studies done in the field of entrepreneurship, the researchers have listed the characteristics of the entrepreneurs as risk-taking, locus of control, creation and innovation, independence, time management, and competitiveness [28,29,8,30,31,32,33].

Besides, regarding the increasing number of students who seek for jobs, the development of this characteristic will enable them to successfully launch their economic enterprise right after graduation.

Purpose of the Research

The purpose of the present research is to study the componential factors of entrepreneurship in order to standardize the scales for measuring the characteristics of entrepreneurial students in Islamic Azad University.

Research Methodology

The population included the whole MA students (in zones 8 and 12) in 18 branches of Islamic Azad University in Iran. As the participants of the study, 1922 students were selected by cluster random sampling method.

Investigating the comprehensive concept of entrepreneurship from different points of views, especially from the approach of characteristics, the main dimensions and components

were obtained in the form of characteristics, and based on that a questionnaire including 68 items was designed. In the first stage, when the introductory questionnaire was designed and edited, in order to do the first investigation about the designed questionnaire it was given to a group of experts to get their feedback about the content of the items designed for extracting the characteristics of entrepreneurship. After eliminating five items from the body of the questionnaire, the resulted questionnaire with 63 items was administered to 34 subjects. Using Cronbach's Alpha method to estimate the internal consistency of the items, the statistical results showed that after omitting five items from the introductory questionnaire, the coefficient of the internal consistency of items was 0.88. This coefficient shows the internal consistency of the questionnaire. In the end, the final version of the questionnaire including 58 items was prepared. The questionnaire consists of 13 factors or characteristics which are the need for progress, the need for independence, risk-taking, creativity, time management, persistency, being purposeful, competitiveness, self confidence, internal control center, accepting criticism, being realistic and vivacious. Entrepreneurship in this research is defined as all the students with above 13 factors.

The researcher has used extracted factors through Varimax Rotation and Linear Structure Relationships Software (LISREL) in order to obtain and to entitle simple construction of entrepreneurship factors.

Research Findings

The first step in factor analysis process which is also its first assumption is Checking Missing Data. In this step, 80 persons altogether were eliminated from statistical analysis so that the factor analysis assumption under the heading of at least missing (0.02) could be observed in each subject. This step has been applied to all items and their ambiguous coefficient was assigned referring to unanswered items. It was determined that all items were of high specific coefficient in a way that the ambiguous coefficient of all items was less than 0.02. Hence, in this research no item has been eliminated but 80 subjects. And, the given situation shows that there is no need to omit some of the items and it is possible to follow the process of Factor Analysis while having all the items.

The second factor analysis assumption points to enough sample size. In this research, Kaiser- Meyer- Olkin (KMO) equals 0.913; consequently, the sample size is sufficient. The process of Factor Analysis made it necessary to decrease the amount of data and be able to pinpoint the constructing factors through focusing on many variables. This also needs a sufficient volume of the research sample and in the process of measuring the correlation among the items; it should be possible to extract the appropriate matrixes. In order to measure the matrixes of variance and covariance, the volume of the research sample should be large enough and the empirical indexes regarding the sufficient size of the volume of the sample should also be mentioned.

The third factor analysis assumption is normality of multi-variation distribution known as Sphericity. The tests which are used to calculate the normality of the multi-variation distribution are known as Sphericity. One of the common Sphericity tests is Bartlett. Regarding the process of Bartlett test which is used for examining the Sphericity, it can be referred as Bartlett test which is done by the Approximate Chi Square. As the Approximate Chi Square equaled 21988.760 with the 453 degrees of freedom, it can be stated that the amount of the Approximate Chi Square is statistically significant and the given static is significant at least at the .999 level of confidence ($\alpha = 0.001$). With the emphasis on the

Bartlett test of sphericity, by comparing the Approximate Chi Square with 453 degrees of freedom, it can be stated that the extracted Approximate Chi Square is significant and confirms the sphericity of the empirical data and the normality of the multi-variation distribution is observable.

The fourth factor analysis assumption is the recognition of communalities scales. As all of the loading scales or communalities coefficient of items with scales are higher than 0.5, we could say there is internal consistency between items and the test as a whole; consequently, factor analysis can be implemented emphasizing at all items.

The fifth assumption of the factor analysis of variance is more than 0.50 and through focusing on the column of Cumulative Frequency Percentage which is represented shortly as "Cumulative", it can be found out that the first factor (16.86) can determine around 20% of the total variance. Similarly, the second factor can determine around 6.39% of the questionnaire variance. Finally, regarding the share and role of each factor, which has been stated in the column of the percentage of variance, the extent to which each factor determines the variance of the whole questionnaire is found out.

After studying table of component matrix precisely, the researcher used Rotation Method so that loading factor of each item can be determined stressing at recognition of each item in one of the 13 factors.

Reiterating that in this research, the researcher has followed Exploratory Factor Analysis and has used Principal Component Methods from Extraction of Factors, Varimax Method was applied. According to Varimax, the researcher was able to determine both the factor to which the item belongs after rotation and the position of each item in related factor with reference to loading factor. This table shows in which factor each item has been located after the rotation.

Hence, emphasizing at the seven fold factors of entrepreneurship, items related to each factor has been summarized in table 2 respectively.

Conclusion and Discussion

Nowadays, the university graduates enter a work environment which is drastically changing. These environmental changes lead to the change in technology and related factors with job opportunities that ultimately create new jobs [34]. Change in the condition and the needs of society have altered the role of universities too. Therefore, the university instruction has been involved in entrepreneurship [18]. The economic situation and population composition also necessitate finding solutions for the economic challenges we face. In this regard, it is necessary to have appropriate models and strategies for training active workforce who is entrepreneurial [35].

Eventually, seven factors have been extracted from rotation of factor analysis; in fact, entrepreneurship consists of seven factors as follows: need to independency, risk-taking, creativity, time management, competitiveness, being realistic and vivacious.

Table-1: Rotated Component Matrix

	Component						
	1	2	3	4	5	6	7
x1							
x2							
x3							
x4							
x5							
x6							
x7			.654				
x8			.651				
x9			.585				
x10			.667				
x11			.614				
x12							
x13							
x14					.582		
x15					.502		
x16					.566		
x17							
x18							
x19							
x20	.516						
x21							
x22	.629						
x23							
x24							
x25	.524						
x26							
x27		.554					
x28							
x29							
x30							
x31							
x32							
x33	.632						
x34							
x35							
x36						.586	
x37						.539	
x38						.570	
x39							
x40							
x41	.576						
x42							
x43		.549					
x44							
x45	.605						
x46							
x47	.642						
x48							
x49		.620					
x50							
x51	.582						
x52							
x53				.644			
x54				.576			
x55							.591
x56							
x57							
x58							.595

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 8 iterations.

Table 2: Results of Factor Analysis of Entrepreneurship Construct

Factors	Index	Items
First Factor	Competitiveness	7-8-9-10-11
Second Factor	Creativity	14-15-16
Third Factor	Time management	20-22-25-33-41-45-47-51
Fourth Factor	Being vivacious	27-43-49
Fifth Factor	Risk-taking	53-54
Sixth Factor	Being realistic	36-37-38
Seventh Factor	Need to independency	55-58

Regarding the research background and the related theories, the seventh factors involved in entrepreneurship show that the entrepreneurship scale almost generally covers the factors which make it. Hence, it can be concluded that the results obtained from the administration of the tool and the level of students' entrepreneurship determined by the application of the tool as well as the validity of it are generally acceptable.

Sohrabi et al. (2006), in their research entitled, "Validation of measuring scale for entrepreneurship in the managers of governmental organizations" refer to hardworking, risk-taking, locus of control, creativity, innovation, flexibility, doubt, and ambiguity resistance as the main components of entrepreneurship [31]. The results of the study carried out by Mottaqi (2002) indicated that the scale of measuring entrepreneurship is consisted of presenting new services, innovation, familiarity with the duties, decentralization, flexibility, focusing on values and abilities, paying attention to motivation and reward, paying attention to the results of the action, observing rules and regulations, being involved in political issues, paying attention to the organization problems, accomplishing the duties, and dependence to the organization [36]. In his research, Yaghoubi (2005) also emphasized on the same components [37].

Dunkelberg and Cooper (1982) believe that entrepreneurs have the characteristics of risk-taking, seeking development, independence, and skill [28]. Sexton and Bowmna (1984) consider the entrepreneurs as people who are vivacious, with positive reactions toward problems and obstacles [30]. Mancuse, Welesh and White believed that entrepreneurs are risk takers [38]. Druker (1985) believed that entrepreneurs have the common characteristics of risk-taking [39], and Dunkelberg and Cooper (1982) also refer to risk-taking as the most important characteristics of entrepreneurs [28]. Hornaday and Aboud (1971) and Brokhouse (1980) believed that entrepreneurs have the characteristic of internal controlling [8,40]. Timmons (1990) considers innovation as one of the characteristics of entrepreneurs [32]. In their study, Kiani Mavi and Kiani Mavi (2012) stated that entrepreneurs' characteristics are determination, risk-taking, creativity, independence, and inclination to success [1]. Zali et al. (2007) referred to the characteristics of entrepreneurs as inclination to success, independence, risk-taking, creativity, and determination [3].

In the comprehensive model of entrepreneurship that has been suggested by the Indian Institute of Entrepreneurship Development, entrepreneurs have five characteristics: inclination to success, independence, risk-taking, creativity, and determination [41]. In his research, Azizi (2003) found that there is a significant relationship between entrepreneurship and variables like locus of control need for progress, creativity and innovation, and independence [17]. Sharifzadeh (2004) also referred to competitiveness, inclination toward

progress, power, and risk-taking as characteristics of entrepreneurship [18]. Hadad Adel (2000) found that entrepreneurs enjoy the characteristics of the need for progress, independence, creativity, and innovation [19]. However, in his research, Gürol (2006) found that entrepreneurs are those people whose characteristics consist of ambiguity resistance, self-confidence, risk-taking, locus of control, and need for progress [23]. In addition, Hildebrando (2003) and Kamalanabehan (2006) referred to entrepreneurs' characteristics as risk-taking, creativity and need for progress [24,25]. Gillian, et al. (2002) considered creativity and risk-taking as the most important characteristics of entrepreneurs [26]. While, in their study, Kuratko, et al. (2014) have indicated that the characteristics of entrepreneurs include risk-taking, need for progress, inclination toward success, and locus of control [21].

The seven factors extracted from this research analyzing students' entrepreneurship are in line with other researches inside and outside the country. The first factor of entrepreneurship is competitiveness which matches findings of Sharifzadeh (2004); and Hornaday (1982) [18,29]. The second factor of entrepreneurship is creativity which is in concordance with findings of Kiani Mavi and Kiani Mavi (2012); Zali et al. (2007); Casson (1982); Edwards (2003); Thompson (1999); Azizi (1382); Haddad Adel (2000); Koh (1996); Helm (2007); Gürol (2006); Hildebrando (2006); Gillian, et al. (2002); Hornaday (1982); and Hassan Moradi (2004) [1,3,42,11,43,17,19,21,22,23,24,26,29,44]. The third factor of entrepreneurship is time management which coordinates the findings of Zahedi (2003) [33]. The fourth factor of entrepreneurship is being vivacious which is in conformity with the findings of Hornaday (1982); and Sexton (1984) [29,30]. Risk-taking is the fifth factor of entrepreneurship which is in line with researches of experts like Kiani Mavi and Kiani Mavi (2012), Zali, et al. (2007), Brockhaus & Horwitz (1986), Thompson (1999), Azizi (2003), Sharifzadeh (2004), Jahangiri (2003), Haddad Adel (2000), Kuartko et al. (1993), Ahmadpour Dariani (2004), Koh (1996), Gürol (2006), Kamalanabhan (2006), Hildebrando (2006), Gillian et al. (2002), and Hasan Moradi (2004) [13,9,43,17,18,45,19,20,46,21,23,25,24,26,44]. The sixth factor of entrepreneurship is being realistic which is in conformity with the findings of Tusi, as cited in Hassan Moradi (2004); and Dubrin et al., as cited in Moghimi (1998) [44,47]. The seventh factor of entrepreneurship is the need for independency, which is in line with the findings of Kiani Mavi and Kiani Mavi (2012), Zali et al. (2007), Haddad Adel (2000), Jahangiri (2003), and Kuartko and Lhodgetts (2001) [1,3,19,45,20].

The purpose of many world reputable universities is to train students and bring up graduates who become entrepreneurs. In fact, nowadays, promoting the entrepreneurial ability of the students has become the national mission of the university administrators and policy makers of the countries. However, the fact is that entrepreneurship development in a society needs the identification and support of entrepreneurs [3]. One of the fundamental issues of higher education is the development and institutionalization of students' entrepreneurship. Through training entrepreneurship, it is possible to strengthen the students' entrepreneurial behavior. The purpose of entrepreneurship training should be providing students with knowledge and skill. The ultimate goal should be training students who have entrepreneurial attitude.

Since in this research, the entrepreneurship questionnaire enjoys some psychoanalytic features specifically construct validity, it is recommended that afore-said questionnaire be used in the coming researches of entrepreneurship analysis specifically of students of Islamic Azad University and other universities which are in similar conditions.

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Acknowledgments

This is to acknowledge the research department of the Islamic Azad University Roudehen Branch which financially sponsored this study to be accomplished.