

Development of an instrument for measuring entrepreneurial skills for students of higher education institutions

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Abstract

The entrepreneurship understood as the act of converting an idea into a concrete project is for social or economic purposes, is a necessary and indispensable factor for university students since it develops in them skills and competences for a self-sustaining working life, for that reason The university as an agent of innovation must promote it in its students, generating in them a more active citizen participation that leads to the development of viable projects attending to diverse personal and social demands that are reflected in a local, state, national, and if possible internationally. From this perspective the present research had as main objective to elaborate a questionnaire that allows to identify the enterprising competences of students of superior level. Thus, the instrument was subjected to rigorous statistical tests in order to validate and reliability. With the purpose of using it in future researches that intend to quantitatively measure entrepreneurship in undergraduate students.

Instrument, Entrepreneurship, University

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1. Introduction

In the current Mexican context, the change occurs in an accelerated and uncertain way, together with the socio-political situation in which the country finds itself, which has meant that the new generations no longer have wage security when they graduate from higher education. This uncertainty and lack of opportunities in their immediate contexts has led many young people to migrate to other countries, where job opportunities are higher. Or, on the other hand, it has also forced them to look for autonomous and independent ways of generating economic income, their own businesses that are related to their fields of study income but also new opportunities for professional development.

This is how entrepreneurship is having a great boom in the lives of young students who are looking for new strategies through which they can visualize their ideas, manifesting themselves in a viable project. From the above, there is a need to design an instrument that measures the students' skills that Mexican universities promote in their students.

1.1 Justification

In recent years, the study of entrepreneurship has gained increasing interest within universities, since the number of students seeking the necessary means to materialize their projects has increased considerably, generating innovative ideas in different sectors of the human activity. An important line of research that emerges from the study of entrepreneurship is to determine the capacities of young entrepreneurial university students or what are the characteristics that differentiate them from the rest of the students. Likewise, efforts have been made to study whether current universities develop in students the necessary skills to generate and develop an idea and materialize it into a viable project.

Previous research has taken as a basis several factors that seek to explain the entrepreneurial capacity of university students. Such is the case of Gutiérrez Sivira (2006), who carries out a study that identifies the role of universities and the formation of the entrepreneurial culture from a local development perspective. Or the research carried out by Mavila (2009) that aims to determine the possible factors that explain the entrepreneurship capacity of the UNMSM students, and from there contribute to the formulation of the guidelines that allow the University to develop the educational and training foundations that encourage the business mentality of their students.

Under this paradigm arises the present investigation whose relevance is to design a measurement instrument that allows to identify which are the entrepreneurial capacities that a university student must have and thus be able to develop research lines that revolve around their measurement, making possible the development of programs that allow formulating intervention strategies in Mexican universities.

1.2 Problem

Today's increasingly complex reality requires university students to develop skills to undertake business, that is, not only put into practice the theory taught in universities, but also be able to envision themselves in the field of entrepreneurship development. Vigorena Pérez (2006), refers that the current university has the mission of being a place where new ideas and thoughts are generated that transform society, generating young innovators. It needs to reinterpret the conception of traditionalist education to promote in the students the ideas of innovation, creativity and change. Which is only going to achieve from what is called entrepreneurial education.

Premise that aims to address this research by developing an instrument to measure entrepreneurial skills in university students.

1.3 Objectives

1.3.1 General Objective

Develop a measuring instrument for the entrepreneurial skills of students of higher education institutions.

1.3.2 Specific Objectives

- Validate an instrument to measure the entrepreneurial capacities of students in higher education institutions.
- Reliabilize an instrument to measure the entrepreneurial capacities of students in higher education institutions.
- Generate lines of research to measure the entrepreneurial skills of students in higher education institutions.

2. Theoretical Framework

The main objective of entrepreneurial education is to generate and produce massively independent people, generating wealth, creating and willing to take risks. On the other hand, Guerrero and Urbano (2012) mention that the entrepreneurial university concentrates on fulfilling teaching, research and entrepreneurship activities. For this reason an Institution of Higher Education Entrepreneurship (HEI) has the obligation to innovate, recognize and create opportunities, work in teams, take risks and respond to challenges (Kirby, 2005, cited by Guerrero and Urbano, 2012). In the same way, it should seek to create a substantial transformation in the organizational character and have a more promising attitude for the future (Clark, 1998, cited by Guerrero and Urbano, 2012).

In other words, the entrepreneurial university is a natural incubator that provides support structures for academics and students to initiate new intellectual, commercial and combined projects (Etzkowitz, 2003, cited by Guerrero and Urbano, 2012). Based on this, says the author, HEIs need to become more entrepreneurial institutions. Its members have to be potential entrepreneurs, and their interaction with the environment has to follow a pattern of entrepreneurship. Then, the results generated by these universities will contribute to social development and economic growth (Schulte, 2004, cited by Guerrero and Urbano, 2012).

In this understanding, undertaking means initiating, exploring, promoting, organizing, taking risks. Then an entrepreneur is the person who identifies an opportunity and organizes the necessary resources to get it going. An entrepreneur is that individual who seeks or sees an opportunity and wants or tries to convert it into a business, or simply looking for new ways to improve their life and in some cases that of others (Mavila Hinojoza, Tinoco Gómez and Campos Contreras, 2009).

Entrepreneurial education refers Vigorena Pérez (2006), is aimed at providing the young university with the skills, abilities, tools and instruments to become an agent of economic and social development thus overcoming the limitations of its context. Seeks to generate independent young people, innovative, creative entities, that automotiven to question the established rules and meet their personal goals through their own action. It is necessary to say González Geraldo (2015) that entrepreneurial education enables comprehensive education that conceives the person as the protagonist of the educational process, introducing the learner to its socio-cultural reality.

Based on the above, Gutiérrez Sivira (2006), states that it is also necessary to teach an entrepreneurial culture in the university. The Entrepreneurial Culture, the author refers is one of those constructions that the new development model requires. It involves the construction of individual behavioral patterns linked to collective actions that signify the performance of innovative tasks that generate goods and services. That is why entrepreneurship is framed within an individual and collective nature, where factors such as creativity, imagination, the energy to change a situation and the willingness to develop it are combined with the leadership capacity to motivate and synergize with the others involved, which make possible the development of a project (Gutiérrez Sivira, 2006).

From the above, Gutiérrez Sivira (2006), mentions that the enterprise is:

"The ability to carry out action projects within the context of opportunities that have been identified and that contain enough energy to organize the means and resources to implement it. It is also an individual and collective behavior that implies basic attributes and competencies and some extraordinary ones that make viable the possibility of action to be undertaken" (page 148).

Likewise, this author refers, young people should be able to generate innovation capacity, since it is seen as a tool sine qua non for the socioeconomic development of nations. Only people capable of innovating, that is, adding new practices, new products, new processes or systems in a company, institution or community in a particular product or service, will achieve the desired development. Based on the foregoing, the entrepreneurship skills that are studied in this research are: 1) Ability to socially relate, 2) Entrepreneurial innovation, 3) Entrepreneurial planning and 4) Personal accomplishment. Which are explained below.

Ability to socially relate

A social or personal network, in the entrepreneurial field is a group of people who may or may not know each other and who in some way contribute to the entrepreneurial activity, be it passive, reactive or proactive. Although there are few attempts to empirically relate entrepreneurial activity to the structure of social relationships, some research suggests that personal ties have a direct impact on an individual's decision to found a new company (Gilmore and Carson, 1999, cited by O. de Castro, Justo and Maydeu Olivares, 2006).

Urbano and Toledano (2014) mention that these relationships encompass social processes that revolve around a commercial activity. Specifically, in these cases, the social network is defined as: "A set of direct and indirect relationships that the entrepreneur maintains with different people from their socioeconomic and family environment" (p 233). Through its social network, say the authors, the entrepreneur can obtain the resources, means and support he needs to start up his business or innovative project. In addition, in some cases, the authors suggest, the social network is what gives you the idea of the product or service with which you will work. In this way, the direct and indirect contacts that the entrepreneur maintains can contribute both to the conceptual development of the business and to its implementation.

Entrepreneurial innovation

The ability to innovate is understood as the tendency of a company to support and carry out new ideas, as well as novelty, experimentation and creative processes that can result in new products, services or technological processes (Fernández Mesa, Alegre Vidal and Chiva Gómez, 2012).

Thus, innovation is a crucial factor in the company's results as a result of the evolution of the competitive environment (Newey and Zahra, 2009, cited by Fernández Mesa, Alegre Vidal and Chiva Gómez, 2012).

Based on the above, Elche and González (2008, cited by Fernández Mesa, Alegre Vidal and Chiva Gómez, 2012) define entrepreneurial entrepreneurship as the process of improving the company's capacity to acquire and use the skills of different members of the company and in this way use the capacity for innovation.

From the above, Leite, Correia and Sánchez - Fernandez (2015), refer that to innovate, the entrepreneur does not need only knowledge, must develop attitudes: the ability to move forward, not to be intimidated by problems, persistence, leadership, creativity, innovation and the ability to convince. Thus, the authors say, HEIs can not limit themselves to just giving knowledge and sending their graduates to the market, they have to include the factor of innovative entrepreneurship in training, so that their students are able to create their own position of work at the end of his training.

Entrepreneurial planning

An entrepreneur according to Rodríguez Moreno and Gómez Murillo (2014), has the capacity to generate ideas, turn them into something novel to positively transform their life and their environment. The entrepreneur generates motivation in others to achieve objectives.

The entrepreneur must be goal oriented, that is, the ability to focus efforts to achieve objectives, taking into account the cost - benefit (Bogotá Emprender, 2010, cited by Rodríguez Moreno and Gómez Murillo, 2014).

Likewise, it must have the capacity to understand the changes in the environment and establish its impact in the short, medium and long term, optimizing strengths and acting on the weaknesses to take advantage of opportunities (Alles, 2009, cited by Rodríguez Moreno and Gómez Murillo, 2014). The entrepreneur must know what his business is, where he wants to go and how to reach the objectives, that is, he must make a strategic analysis in order to make decisions.

Personal fulfillment

The entrepreneurial attitude is a state of alert that detects business opportunities based on the variety of individual perceptions (Kirzner, 1973, cited by Espíritu Olmos, 2011). Likewise, the value of the entrepreneur is based on taking advantage of the opportunities without taking into account the procedures of a misallocated distribution of resources. This attitude that entrepreneurs possess has been well studied from different approaches such as sociological, ecological and psychological. However, most of the research is based on the fact that some of the characteristics of the personal fulfillment of entrepreneurs are manifested through three features:

1. Locus of control: It is related to the belief that the actions that one performs determine the results that one obtains. People with a locus of high internal control, think that they are able to control the results, so they will devote more effort and persistence towards the desired results, which, in turn, should help start a business venture and keep it successful (Sánchez García, 2010).

2. Self-efficacy: Self-efficacy, according to Bandura (1986, cited by Sánchez García, 2010) is an attribution of personal competence and control in a given situation and reflects the perception of a personal capacity to perform a specific job or task. Self-efficacy affects the choice of action and the amount of effort exercised, being the main individual predictor of career choice.
3. Propensity to risk: This is defined as the personality trait that determines the tendency and willingness of the individual to take risks. Individuals with this trait will be inclined to high risk behaviors; that is to say, they will consider the alternatives whose final consequences may move away from their framework of expectations of results. On the other hand, subjects with low propensity to risk will tend to low risk behaviors, and avoid alternatives that may cause results that vary greatly from their expectations (Das and Teng, 1997, cited by Sánchez García, 2010).

3. Methodology

Kind of investigation: Quantitative

Methodology for the realization of the pilot Test

For the development and design of the instrument to measure the entrepreneurial abilities of university students, a reagent matrix was designed to theoretically identify the variables considered for the measurement of entrepreneurship, being the one shown below:

Variables	Indicator	Item	Bibliography
Ability to socially relate	Establishment of entrepreneurial contact networks	Ease to develop networks of contacts (individuals, professionals)	Goleman (2006)
		Promote meeting between social actors (private sector, social and public) to be served from the entrepreneur project	Goleman (2006) Vigorena, (2006)
	Establishment of communication sources	Presence: includes personal presentation, the use of verbal and non-verbal language regarding cultural patterns.	Gutiérrez Sivira (2006)
		Clarity: Can say what is meant in a concise and clear way. Be able to speak in a way that people can easily understand.	Vigorena, (2006)
		Empathy: It is the ability to make agreements with others. Know how to develop joint interests, facilitates the achievement of shared interests.	Gutiérrez Sivira (2006)
	Strategic planning capacity	Leadership and Setting objectives	Define specific goals or purposes in their performance
Propensity to risk (Ability to make decisions with an associated level of risk)			
Management and control of resources		Manage resources rationally	
	Applies quality controls doing "good" things		
Capacity for personal fulfillment	Personal characteristics	Self control	Goleman (2006)
		Enthusiasm and tenacity in front of all kinds of setbacks	
		Intense work discipline	
		Business vocation (Desire for creation and innovation of own companies)	
		Self-training	
Innovation capacity of the person	Innovative attitude	Attitude towards risk	Tinoco Gómez (2008)
		Innovation	
		Proactivity	
		Ability to generate knowledge	

		Ability to apply knowledge	Guerrero y Urbano (2012)
		Capacity for the dissemination of knowledge	
		Capacity for the exploitation of knowledge	

Table 1 Matrix of reagents of the variables that measure entrepreneurship

Source: Own elaboration (2017)

Once the reagent matrix of the instrument was made, a version of it was designed so that it could be sent to experts in the field and generate a valid appearance. Regarding the scale of measurement with which the items were weighted, this is made up of five response options or indicators, which are shown in Table 2:

1	2	3	4	5
Totally disagree	disagree	Probably	agree	Totally agree

Table 2 Indicators of the reagents of the instrument

Source: Own elaboration (2017)

Regarding the application of piloting, 30 surveys were conducted to students of different degrees and semesters of higher education institutions, both public and private, to obtain the validity and reliability of the instrument reporting the results presented below.

4. Results

Validity of the instrument

To determine the validity of the instrument, the statistical test "Factorial Analysis" was used through the sample adequacy measure of Kaiser - Meyer - Olkin reporting a score of .581 for the general validity of the instrument with a level of significance of .000. that refers that the instrument has an unacceptable validity.

Sample adaptation measure of Kaiser-Meyer-Olkin.		.581
Bartlett's sphericity test	Approximate Chi-square	378.630
	gl	231
	Sig.	.000

Table 3 General validity of the instrument

Source: Own elaboration (2017)

Regarding the validity of the variable "Capacity to relate socially", a validity of .557 was obtained, with a level of significance of .002, which shows that this variable has an unacceptable validity.

Sample adaptation measure of Kaiser-Meyer-Olkin.		.557
Bartlett's sphericity test	Approximate Chi-square	27.598
	gl	10
	Sig.	.002

Table 4 Validez de la variable Capacidad para relacionarse socialmente

Source: Own elaboration (2017)

On the other hand, the validity of the variable "Strategic planning capacity" shows a validity of .752 with a level of significance of .000 which indicates that the items of this variable have good validity.

Sample adaptation measure of Kaiser-Meyer-Olkin.		.752
Bartlett's sphericity test	Approximate Chi-square	50.742
	Gl	15
	Sig.	.000

Table 5 Validity of the variable "Strategic planning capacity"

Source: Own elaboration (2017)

Regarding the variable "Ability of personal fulfillment" it is observed that it has a validity of .595 and a level of significance of .022 which shows that its validity as well as the first two variables is unsatisfactory.

Sample adaptation measure of Kaiser-Meyer-Olkin.		.595
Bartlett's sphericity test	Approximate Chi-square	14.770
	gl	6
	Sig.	.022

Table 6 Validity of the variable Ability of personal fulfillment

Source: Own elaboration (2017)

Finally, the variable "Innovation capacity of the individual entrepreneur" shows a validity of .852 and a level of significance of .000, which indicates that its reagents are valid to be applied.

Sample adaptation measure of Kaiser-Meyer-Olkin.		.852
Bartlett's sphericity test	Approximate Chi-square	90.006
	gl	21
	Sig.	.000

Table 7 Validity of the variable Innovation capacity of the individual entrepreneur.

Source: Own elaboration (2017)

Thus, based on the above, there is an unfavorable validity of the instrument, which can be improved with a second pilot application.

Reliability of the instrument

To determine the reliability of the instrument, the Cronbach's Alpha test was used to determine the internal relationship of the reagents. Showing the following results:

Cronbach's Alpha
.894

Table 8 General reliability of the instrument

Source: Own elaboration (2017)

Table 8 shows that the reliability, from the Cronbach's Alpha test, of the instrument in general is .894, which indicates that it is a reliable instrument to be applied.

As for the variable "Ability to relate socially", a Cronbach's alpha of .536 is observed, which indicates that the items of this variable are unreliable.

Cronbach's Alpha
.536

Table 9 Reliability of the variable Ability to socially relate

Source: Own elaboration (2017)

For the variable "Strategic planning capacity" a Cronbach's alpha of .785 was obtained, which indicates that the reagents of this variable are correlated.

Cronbach's Alpha
.785

Table 10 Reliability of the variable Strategic planning capacity

Source: Own elaboration (2017)

On the other hand, for the variable "Capacity for personal fulfillment" a Cronbach's alpha of .616 was obtained, which refers to an acceptable reliability.

Cronbach's Alpha
.616

Table 11 Reliability of the variable Ability of personal fulfillment

Source: Own elaboration (2017)

Finally, the variable "Innovation capacity of the individual entrepreneur" shows a Cronbach's Alpha of .875 which shows a high reliability among its reactants.

Cronbach's Alpha
.875

Table 12 Reliability of the variable Innovation capacity of the individual entrepreneur

Source: Own elaboration (2017)

Thus, by virtue of the foregoing, it is shown that in terms of reliability the instrument can be applied in future investigations. Likewise, the Pearson correlation was used to determine the internal correlation of the instrument's reagents, finding high correlations in the reagents of the instrument.

5. Conclusions

Entrepreneurship, at present, is a trigger to innovate the curricular designs of higher education institutions promoting in students the generation of ideas that materialize in viable projects of self-development or social development, which is why it is important to conduct research that, like this one, allow the creation of measurement instruments that generate similar research lines that allow the exploration of entrepreneurial skills to continue. From the above, the importance of the presented instrument, which although it has some areas of improvement in the validity, can be corrected by improving the application of the pilot test.

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7. Anexo

ESTUDIO DE CAPACIDAD EMPRENDEDORA

Objetivo: El presente instrumento tiene la finalidad de conocer el nivel de desarrollo de las capacidades emprendedoras en estudiantes de universidades latinoamericanas.

Instrucciones: Se le solicita marcar solo una de las opciones que mejor describa su respuesta atendiendo los siguientes parámetros.

1. *Totalmente en desacuerdo*. 2. *En desacuerdo*. 3. *Probablemente*. 4. *De acuerdo*. 5. *Totalmente de acuerdo*.

Licenciatura: _____ Semestre: _____

1. CAPACIDAD PARA RELACIONARSE SOCIALMENTE

1 2 3 4 5

1.1	Promover encuentro entre actores sociales (Sector privado, social y publico) para ser atendidos desde el proyecto emprendedor					
1.2	Sensibilidad social: Saber comprender la situación de un entorno e interpretar el comportamiento de los individuos dentro de ese entorno.					
1.3	Presencia y autenticidad: Comprende la presentación personal, el uso del lenguaje verbal y no verbal, respeto de patrones culturales, naturalidad y transparencia.					
1.4	Claridad: Saber decir lo que se quiere decir, de forma concisa y clara. Ser capaz de hablar de manera que las personas puedan entender con facilidad.					
1.5	Empatía: Es la capacidad de conectar con los demás. Saber desarrollar intereses conjuntos, facilita el logro de retos compartidos.					

2. CAPACIDAD DE PLANIFICACIÓN ESTRATEGICA

1 2 3 4 5

2.1	Visualiza anticipadamente el resultado de sus acciones					
2.2	Define metas o propósitos concretos en su desempeño					
2.3	Administra racionalmente los recursos					
2.4	Aplica controles de calidad haciendo bien las "cosas"					
2.5	Evalúa y corrige las acciones					
2.6	Propensión al riesgo (Capacidad de tomar decisiones con un nivel de riesgo asociado)					

3. CAPACIDAD DE REALIZACIÓN PERSONAL

1 2 3 4 5

3.1	el entusiasmo y la tenacidad frente a todo tipo de contratiempos					
3.2	la empatía, ponerse en la "piel" de los demás					
3.3	Disciplina de trabajo intenso					
3.4	Vocación empresarial (Deseo de creación e innovación de empresas propias)					

4. CAPACIDAD DE INNOVACIÓN DEL EMPRENDEDOR INDIVIDUAL

1 2 3 4 5

4.1	Actitud hacia el riesgo					
4.2	Innovación					
4.3	Proactividad					
4.4	Capacidad para la generación de conocimiento					
4.5	Capacidad de aplicación del conocimiento					