

Binding educational model (bem) for the training of competences in innovation and entrepreneurship of business projects based on technology

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Abstract

This article describes an Binding Educational Model (BEM) in the Superior Technological Institute of Salvatierra (ITESS), proposed to increase the generation of technology-based companies in Mexico. This approach aimed at linking university education with the social, technological and entrepreneurial sectors, because the high unemployment rate and the low creation of innovative high impact companies are relevant factors for the competitiveness of the country.

The present research has a qualitative approach, with a descriptive scope. In this context, seven managers, eight students, eight *ex-alumni* and seven ITESS teachers interviewed.

The study concludes that an educational scheme on innovation and entrepreneurship should be developed that promotes the development of attitudinal and professional competences in ITESS students. The program surrounded by an internal and external entrepreneurial ecosystem that promotes assists and supports the projects generated in the technology.

Educational Model Binding, innovation and entrepreneurship

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Introduction

According to the Organization for Economic Cooperation and Development [OECD], there is a lot of entrepreneurship in Latin America, but most of it is informal and not original, which explains the high rate of early mortality, as shown by the GEM studies (2016). These results indicate that, in order to promote the development of a quality enterprise in the region, the capacity of entrepreneurs to innovate with scalable products and services of greater value must be improved (OECD, 2009).

Training in innovation or entrepreneurship must take into account the development of the necessary attitudes so that learners can start high impact projects, efficiently facing the barriers that arise in the course (OECD, 2012).

At the same time, students are required to acquire the technical and practical knowledge of the business management process, which ranges from the conception of the idea, to the formation of the company and the management of its growth.

This article proposes an academic model that promotes innovation and entrepreneurship in the Higher Technological Institute of Salvatierra (ITESS) in Mexico. This proposal is based on interviews with different actors involved in the entrepreneurial ecosystem of the same institution.

A documentary review was also made about the competences that innovative and enterprising people should possess.

Justification

It is undeniable that the economic advance of any nation is intimately linked to that of its technological and business sector.

In general, this proposal is related to the priorities of the country because, although innovation and entrepreneurship in Mexico have grown in recent years, the contribution that has been made to the country's economic and technological development is questionable. Very few young people with university training start a technology-based business (Pro-Mexico, 2014).

The knowledge obtained through this research has made it possible to identify the educational needs in terms of innovation and entrepreneurship required by ITESS. The purpose of this knowledge is the generation of an educational model on topics of innovation and entrepreneurship that allows students to develop the necessary skills in these areas and that besides employing or self-employed professionally, they dare to generate technology-based companies, contributing to the technical, economic and social development of the region.

It is worth mentioning that the generation of this educational model may serve as a working scheme for other institutions of higher and higher secondary education interested in the entrepreneurial and innovative training of their students.

Problem Statement

The role of small and medium enterprises in Mexico is of the utmost importance. According to the data of the INEGI (2016), in our country there are approximately 4 million 15 thousand business units, of which 99.8% are SMEs that generate 52% of the Gross Domestic Product (GDP) and 72% of the labor occupation. In this sense, it is necessary to encourage the creation of new formal companies, as a mechanism of economic growth that generates employment, promotes innovation and therefore competitiveness.

However, the report of the GEM (2016) shows that we are in the 30th position of the countries of Latin America and the Caribbean in relation to the ranking of business perception of opportunities, capabilities, intentions and failure. In turn, we are located in the 45th position of the business education section in the school stage of the same area.

According to the INEGI (2016) in the aforementioned year, there were 1,039,173 unemployed people in Mexico who have a degree of higher and higher education.

This figure represents 46.5% of the total number of unemployed people in the nation and is the highest proportion since registration since 2005, a period in which this rate increased by 11.1 percentage points. On the other hand, in the state of Guanajuato this indicator represents 35.7% of the total of the unemployed (STPPS, 2016)

The annual follow-up survey of graduates carried out by the Salvatierra Technological Institute shows that only 3% of graduates are undertaking any type of business and none of these is technology-based (ITESS, 2016).

At present, the Higher Technological Institute of Salvatierra does not have a development model of innovation and entrepreneurship competencies adapted to its specific context, which allows the management of high-impact, technology-based business projects.

Research question

Thus, the following research question arose:
How to develop the training of competencies in innovation and entrepreneurship of technology-based business projects in ITESS students?

Investigative Assumption

Derived from the previous approach, the following investigative assumption was formulated (working hypothesis):

Through a Binding Educational Model (BEM), it is possible to develop skills training in innovation and entrepreneurship of technology-based business projects by ITESS students.

General purpose

Generate a proposal for a binding educational model (BEM) to develop the training of innovation and entrepreneurial skills of IT-based business projects by ITESS students, through a heuristic analysis, with a hermeneutic scheme and phenomenological nature, supported by the grounded theory.

Literature Review

Competencies for innovation

Innovation is defined as: the introduction of a new and improved product, service, process, work method and marketing or the use of a new organizational scheme in the internal practices of the company, also the organization of the workplace and as a result this significantly favors the growth and development of the company. (OECD and European Communities, 2005).

Dyer, Hal, and Clayton (2011) identify five capacities demonstrated by the best business innovators, these are: 1) Associate: establish connections between questions, problems or ideas from unrelated fields; 2) Question: pose questions that challenge common wisdom; 3) Observe: examine the behavior of customers, suppliers and competitors to identify new ways of doing things; 4) Experiment: build interactive experiences and elicit unorthodox responses to see what ideas emerge; and 5) Networking: meeting people with different ideas and perspectives.

For Huberman (1973) the individuals who most often produce innovations have a series of common traits, among them self-confidence, risk acceptance, youth, a high social position, more intense contacts outside of normal life. his immediate community and a tendency to direct opinion among his colleagues.

Competencies for entrepreneurship

Furnham (1995) tells us that an entrepreneur is a person who detects an opportunity and creates an organization (or acquires it or is part of a group that does it) to face it.

Entrepreneurship is the attitude and aptitude of the person or company that undertakes new challenges projects; is what allows you to advance a step forward, go beyond where you have already arrived, is what makes a person or company is dissatisfied with what is and what has been achieved, and as a consequence, wants to achieve greater achievements (Cañibano, 1988).

According to Kao, (1989) the entrepreneur is a person with very particular characteristics, including: Total commitment, determination and perseverance, ability to achieve goals, orientation to goals and opportunities, responsibility and initiative, persistence in solving problems, Realism, self-confidence, high energy levels, search for feedback, high internal control, calculated risk taking, integrity and reliability and tolerance to change.

Competencies and professional training

Bunk (1994) states that he has professional competence: who has the knowledge, skills and attitudes necessary to practice a profession, can solve the problems of his professional performance in an autonomous and flexible way and is able to collaborate with his professional environment and in the work organization

For the current university, which is increasingly focused on the student's attention as a person that is built in the process of professional learning, the humanistic training of competent professionals committed to social development is a concern and a reason to be occupied. The simple idea that a competent professional is one who possesses the knowledge and skills that enable him to perform successfully in a specific profession has been left behind, replaced by the understanding of professional competence as a complex phenomenon, which expresses the potential of the person to guide their performance in the exercise of the profession with initiative, flexibility and autonomy, in heterogeneous and diverse scenarios, based on the integration of knowledge, skills, motives and values that are expressed in an efficient, ethical and socially committed professional performance (Delors, 1996).

In this sense, every university should add to the scientific and technical education of students the development of the so-called generic competences. These are cognitive, social, emotional and ethical competences, which represent the initiative, effort for quality, responsibility, etc.) that are transferable and constitute the know-how in the professional education of the university student (Corominas, 2001).

The ILO (1993) points out in this regard, that attitudinal competences are directly related to know-how or know-how to act in a given situation, and professional competences are related to know-how.

Research Method

This report is the result of a longitudinal investigation, with a two-year journey, with a qualitative approach and based on a heuristic analysis, with a hermeneutical scheme and phenomenological nature, supported by grounded theory. The technique of semi-structured interviews with an instrument validated by three experts was also used. As tools we rely on an interview guide and audio recordings.

To apply the research instrument, a non-probabilistic intentional sampling was carried out. There were 7 interviews with managers, 8 with students, 8 ex-students and 7 teachers from the institution. In total, the interviewees totaled 30 people.

Reyes, Blanco and Chao (2014) point out that in qualitative research it is correct to establish an average of 4 or 5 semi-structured questions and in the same way the sample size may be small, considering enough 12 people to be interviewed, where important is the rigorous analysis and for this purpose we used the EMFIS Methodology, V-4.0 (Reyes and Hernández-Moncada, 2015).

Results

The results of the qualitative analysis of the data revealed three types of educational needs related to innovation and entrepreneurship that are required in the Higher Technological Institute of Salvatierra, these were: 1 ° Development of attitudinal skills, 2nd generation of professional skills and 3 ° Support for the generation of innovation and entrepreneurship projects. These three types of educational needs are defined as dimensions, and it was determined that each dimension was composed of different number of categories. The dimensions and their respective categories are explained in the following sections.

Attitudinal competences

In this dimension, six categories emerged that the interviewees described as important to develop an ITESS innovation and entrepreneurship program, namely: (1) To be self-aware, which means to recognize who it is, as well as to know its weaknesses and strengths. (2) Be sure that you express yourself as not being afraid to expose yourself socially or to failure, it is knowing that you can achieve your goals. (3) Be collaborative, that is, have the ability to work with other people in a harmonious way to achieve common goals. (4) Being sociable, we define it as the ability to relate to other people to weave networks of interaction. (5) Being creative refers to the ability to solve problems or create something in an original way. (6) To be resilient, which is the capacity of human beings to adapt positively to adverse situations. Subsequently, the interpretation and categorization of the information obtained was carried out.

Professional competences

For the second dimension, six categories emerged that the interviewees expressed as necessary to be able to develop professional competences related to innovation and entrepreneurship, these were: (1) Knowing innovation techniques. (2) Know how to generate models and business plans. (3) Know how to manage your network of professional contacts (Networking). (4) Have knowledge about property and intellectual capital. (5) Manage project management tools. (6) Know how to sell your ideas, that is, acquire technical skills on discourse management, sales and persuasion.

Support for the generation of innovation and entrepreneurship projects

The third dimension consists of seven categories that are considered highly relevant to be able to generate innovation and entrepreneurship projects, which are: (1) Declaration and dissemination of institutional policies aimed at fostering innovation and entrepreneurship. (2) Create an academy or committee for innovation and entrepreneurship, this academy will generate strategies to promote these subjects. (3) Event management to inspire the community to innovate and undertake, these events can be conferences, workshops, seminars, congresses, contests, forums, etc. (4) Develop mentoring, that is, strengthen a link between mentor and mentee so that all projects can work together. (5) Participating in collaborative work among teachers, refers to generating strategies for teachers to work harmoniously with each other when a project of this nature is generated. (6) Promoting a culture of innovation and entrepreneurship throughout the institution, refers to propitiate an organizational communication so that this culture is developed in all the members of the organization. (7) Generate an electronic platform to disseminate the opportunities of the entrepreneurial ecosystem.

In this way, the theoretical construct obtained is represented in the following figure:

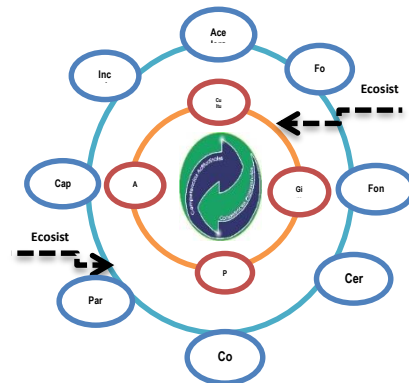


Figura 1 Binding Educational Model (BEM) for the formation of Competencies in Innovation and Entrepreneurship of technology-based business projects. Source: self made

Description of the Binding Educational Model (BEM)

The figure of the center expresses the development of attitudinal and professional competencies in students. The intermediate circle represents the ecosystem that should be promoted within the institution and is composed of the innovation and entrepreneurship academy, the entrepreneurial gym, the entrepreneurial culture, as well as the institutional policies related to these aspects.

The outer circle symbolizes the external ecosystem, which is made up of accelerators and business incubators, technology parks, fundraisers, access to training, competitions, forums, congresses and to Information and Communication Technologies (ICT), as well as coworking.

Conclusions

Up to now, the educational programs used in ITESS focused mainly on the development of technical skills. The proposed model includes both the strengthening of professional skills and the attitudinal competencies of students, which promote individual reprogramming towards the creation of technology-based companies, consolidating patterns of conscious, creative, and collaborative thinking, basic aspects in the innovative enterprise. This in recognition of the fact that the student must interact and be nourished by innovation and entrepreneurship ecosystems, who have the mission of offering significant help to the participants.

Thus, with the work developed, the general objective formulated is fully complied with, that is, a specific proposal was generated on a Binding Educational Model (BEM) to develop the training of competencies in innovation and entrepreneurship of technology-based business projects by the ITESS students, through a heuristic analysis, with a hermeneutic scheme and phenomenological nature, supported by the grounded theory.

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