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Entrepreneurial Innovation Management: the joint Italy–Colombia master's degree

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Abstract

Purpose – The purpose of this paper is to acknowledge the value of joint educational entrepreneurship programs: universities impact on economic growth by building collaborative networks in order to encourage innovation through interdisciplinary training schemes. The case of the master's degree in Entrepreneurial Innovation Management, set up jointly by the University of Salerno and the Universidad Católica de Pereira, is presented.

Design/methodology/approach – In order to conduct a competitive market analysis, the latest data on master's degrees in economics and information technologies management have been collected by means of a scraping procedure in order to build a data set for analysis. The authors have considered the masters' degrees offered in Bogotá, where most universities of Colombia are located.

Findings – The data point out that current master's degree courses do not recognize the importance of interdisciplinary training, which is in great demand in the world of work: economics and computer science never run together and rarely do universities collaborate within a network to set up joint programs.

Practical implications – The entrepreneurial culture could yield economic and social benefits by training students for a dynamic, global and increasingly digital job market. The case study represents a first step in building a network, which could be extended to other countries in the future.

Originality/value – The originality of the study lies in the proposal of a joint Italy–Colombia master's degree, which is set up within a higher education network and may prove useful in creating job opportunities in both countries involved. Moreover, the learning path balances two traditionally separated disciplinary fields: economics and computer engineering.

Keywords Innovation, Academic entrepreneurship, Collaborative network, Entrepreneurial training, Master's degree

Paper type Research paper

Introduction

The relationship between entrepreneurship and economic growth is now urging universities to reassess their role in the performance of the third mission, by renewing relationships with stakeholders and offering a contribution to the socio-economic development of the local territory (García-Peñalvo, 2016). In this respect, universities play a central role in shaping and motivating young people, soliciting innovative ideas and identifying new market opportunities.

As suggested by Bjørnskov and Foss (2016), entrepreneurship and innovation require a fertile environment, in which cultural variables and social norms assume primary importance. As a place of knowledge and cultural exchange, the university can trigger processes for the development of creative and innovative thinking, risk assumption, decision making, the construction of an entrepreneurial mentality and knowledge transfer (Eze, 2011; Eze and Nwali, 2012). Although there has been a widespread call for entrepreneurship training (EU, 2006), there has been a scarce provision of courses in this direction. The university could act as a facilitator of entrepreneurial competences and include new paths in its curricula, while collaborative networks between universities, in terms of partnerships with common educational programs, can give added impetus to entrepreneurship.

Several authors (Audretsch *et al.*, 2008; Urbano and Aparicio, 2016; Urbano *et al.*, 2019) agree that institutional policies have a positive impact on the rate of entrepreneurship, even

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if this feature needs to be more thoroughly investigated. Enterprise is only created in environments that are both legally and socio-culturally conducive to it and the institutional factors affecting entrepreneurship may be formal or informal in nature: formal factors include such features as procedures, regulations, contracts, property rights, business start-up costs and business support mechanisms, while informal factors include social norms, entrepreneurial culture, the cognitive dimension and attitudes toward entrepreneurship. Thus, national policies, legal procedures, entrepreneurial competences, social and economic variables, financial factors, all converge on the identification of business opportunities and, subsequently, on business creation (Bruton *et al.*, 2010).

Guerrero *et al.* (2018) demonstrate how the entrepreneurship education has positive effects on graduates in creating new businesses, because the individual determinants are stronger than support mechanisms, such as incubators or research parks, provided by universities. Thus, educational curricula acquire great importance in improving and managing future entrepreneurial activities.

These considerations have contributed to the creation of the master's degree in Entrepreneurial Innovation Management, based on an agreement between the University of Salerno and the Universidad Católica de Pereira, which will each award a double qualification valid in both countries. In this case, the formal factor is represented by an international collaborative network between academic institutions from different countries, while the informal variable is based on the diffusion of an innovative entrepreneurial culture through an interdisciplinary training program, in line with a dynamic, global and increasingly digital job market. The initiative can impact on the local territory to yield interesting economic and social benefits.

As far as the Italian context is concerned, this proposal falls within the typical activities that universities are required to carry out by law in order to enhance the international dimension of teaching and research. In particular, international cooperation with foreign universities lies at the heart of the internationalization strategy at the University of Salerno.

The first part of this paper examines the literature on academic entrepreneurship, innovation and training. After a description of the methodology used, we investigate the market for master's degrees available in Bogotá, the capital of Colombia, and then we move on to examine the results: no master's degree has an interdisciplinary content. Finally, the conclusions point out the importance of collaborative networks in joint educational programs.

Conceptual framework

Academic entrepreneurship

The concept of academic entrepreneurship has evolved following the introduction of the third mission, which emphasizes universities' impact on the territory in which they operate, because they stimulate and promote the dissemination of knowledge for cultural, social and economic development (Secundo *et al.*, 2017). De Silva (2016) points out that universities play a decisive role in the innovation ecosystem as they are called upon to foster and engage in entrepreneurial activities in addition to their traditional teaching and research functions. The creation of business, founded on technologies that have been developed through academic research, is considered to be an economic development factor at both a regional and a national level (Hayter *et al.*, 2017).

In the literature, academic entrepreneurship is generally associated with the commercialization of research produced by universities. According to Philpott *et al.* (2011), universities can achieve their entrepreneurship objectives through different activities located along a continuum, which range from the so-called "hard" initiatives to "soft" ones, which are closer to their traditional academic activities: the creation of technology parks, spin-off training, patents and licenses, research contracts, business training courses,

consultancy, skills in obtaining grants, publication of academic results and the creation of highly qualified graduates. Nevertheless, universities can bring about further benefits through collaboration agreements with local, regional, national and international partners, or even through alliances and entrepreneurial risk assumption (Guerrero *et al.*, 2015).

A university is not limited to knowledge creation and transfer but it shapes entrepreneurial thinking. Audretsch and Keilbach (2004) introduce the concept of entrepreneurial capital, which can be measured in terms of the creation of new businesses. Siegel and Wright (2015) consider academic entrepreneurship as the commercialization of research, linked to the activities of technology transfer, patents, licenses, start-ups and spin-offs. But other dimensions of the university entrepreneurial ecosystem need to be considered, such as incubators and accelerators, the availability of entrepreneurship courses and programs, the presence of companies on university campuses in order to achieve synergies through the creation of start-ups, universities' collaborative networks between companies and students, business plan competitions to stimulate the entrepreneurial mentality and employee mobility. In Italy, the National Agency for the Assessment of the University System and Research (ANVUR, 2017) measures the value attributed to research in the framework of the third mission and considers the term academic entrepreneurship exclusively in relation to the number of spin-offs created.

Morris (2015) emphasizes that the number of entrepreneurship programs has grown considerably over the last 30 years, in parallel with the development of empirical research on entrepreneurial management training. However, designing an entrepreneurial education of excellence remains a challenge because of the difficulty in balancing creativity and innovative factors with rigor, logic and discipline. Galloway (2017) also suggests that attention should be focused on creativity: "while the world focuses on STEM disciplines (Science, Technology, Engineering, Mathematics), the future belongs to the creative classes: to those who will be able to imagine new forms and functions, to grasp an edge in people, to produce beauty and inspiration through the engine of technology" (p. 86).

Innovation, entrepreneurship and training

The first studies on innovation and entrepreneurship were conducted by Schumpeter (1934), but there are few authors who tackle the two concepts together (Zhao, 2005). Brem (2011) offers an interesting point of view, pointing out that they both lie along a continuum where innovation, i.e. the creation of novelty, is situated at the beginning of the process while entrepreneurship, i.e. the creation of value, lies at the end: the two elements are not often present simultaneously but they only partially overlap or are parallel. However, even though the two terms are used interchangeably, they are not identical because not all entrepreneurs innovate (Autio *et al.*, 2014) and sometimes elements of innovation are introduced into business by managers rather than by entrepreneurs (Szirmai *et al.*, 2011).

Several economic factors generate a positive impact on innovation and entrepreneurship, such as an appropriate monetary policy by financial institutions and a favorable social climate to encourage innovative entrepreneurial activity (Galindo and Méndez, 2014). In this sense, the function of higher education should be to stimulate entrepreneurial culture by allowing students to identify and seize new business opportunities. An educational system that aims at entrepreneurship but which also monitors the dynamics of a changing labor market should facilitate the acquisition of new competences and capabilities. Fostering "the development of an entrepreneurial mindset in students means allowing them to be in control of their own life projects so as to be fully aware of the work context while achieving specific objectives and seizing opportunities" (della Volpe and Esposito, 2017, p. 16). As highlighted by Fajardo *et al.* (2016), it is essential to build a so-called intelligent capital based on knowledge, practical experience and networking. Neck and Greene (2011) stress the importance of teaching such principles as "living with uncertainty, identifying

opportunities, entrepreneurial mindset, creation, decision-making process, developing empathy, business design, culture, work-life balance, social responsibility, and profiting from failure" (p. 56). All these variables help to create economic, social and personal value. Kucel *et al.* (2016) show how graduates who have been trained in entrepreneurship turn out to be more attentive to job opportunities and more creative in aligning their expectations with job offers.

In the light of our literature review, we now explore the role of entrepreneurship and innovation in Colombia, the country where we aim to set up the joint master's degree. According to a study by Bancolombia (Bolaños, 2018; *ANDI* and *Revista Dinero*, 2017), the role of learning as a factor of economic development is widely acknowledged since entrepreneurs create jobs. Furthermore, 250,000 companies are set up in Colombia in a year, but 6 out of 10 entrepreneurs fail. Only 55 percent of nascent businesses survive the first year. Thus, even though the number of new businesses has increased in recent years, only half hope to grow over the next five years. Financial support initiatives from banks or institutional bodies are not lacking, for instance there are many offers of training programs on subjects of finance, co-working and communication performed through distance learning systems or in the traditional classroom.

Let us now compare Colombia and Italy, considering the Total Entrepreneurial Activity rate reported by GEM (2018), which expresses the percentage of the population that are nascent entrepreneurs or owners of a new business. We find that Colombia has a higher value (18.7 percent) than both the global average (12.5 percent) and Italy (4.3 percent). The picture is reversed when we consider the level of innovation: Colombia is 46th in the world ranking with a level of innovation of 14.9 percent, while Italy is 21st and presents a greater level of innovation (28.2 percent). Innovation in Colombia is more focused on the optimization of costs and production than on innovation. Moreover, we observe how Colombia is moving dynamically toward a more advanced stage of development, while Italy is more advanced in terms of innovation but remains fairly static. A collaborative network in training will help to regenerate and renew both countries, regardless of their stage of economic development.

In conclusion, the relationship between entrepreneurship, innovation and economic growth (Drucker, 2014) is governed by network dynamics, which facilitate access to new technologies, competences and opportunities (Ahuja, 2000), through a continuous flow of knowledge between different players. These networks can be: contact networks, through which organizations acquire knowledge or alliance networks, to activate agreements and generate formal collaborations, joint ventures and frequent interactions. They represent a "form of investment in strategic relationships in order to gain access to knowledge," known as network capital (Huggins and Thompson, 2015, p. 103). In the innovation process, it is essential to recognize and reinforce the value of relationships and cooperation between institutions, such as universities, research laboratories, technology transfer and large companies' R&D. Finally, it is interesting to highlight how the GEM (2017) report states that it is necessary "to encourage master's degrees and PhDs in scientific and technological areas with an entrepreneurial orientation" (p. 11).

On the basis of the scientific observations presented above, we have developed a proposal for a master's degree in Entrepreneurial Innovation Management offered jointly by the University of Salerno and the Universidad Católica de Pereira. The agreement is based on shared principles of exchange, training objectives and generation of competitive advantage for both actors.

Methodology

First of all, we investigated the market for master's degrees offered in the capital of Colombia, Bogotá, where the majority of the country's universities are concentrated.

In particular, we focused our attention on master's degrees, offered in the period 2017–2018, in economics and management, including the management of information technologies used to support decision-making processes. Accordingly, we analyzed master's qualification in economics, marketing, strategic management, business administration (Master in Business Administration (MBA)), accounting and finance, innovation management, corporate social responsibility and environmental development, systems engineering and computational analysis, network management and information technology.

We gathered data from the official websites of universities located in Bogotá by means a traditional web scraping technique, a form of data mining. According to Sirisuriya (2015), this procedure allows us to transform unstructured data on the web into structured data, ensuring accuracy through human intervention, which is lacking in the web scraping software used to recognize data automatically on web pages. In fact, most websites displayed data on different web pages, thus making it impossible to extract a copy of data. For this reason, we preferred the traditional copy and paste scraping technique more suitable for the amount of our data.

Successively, the extracted data were stored and analyzed in a local database table built using 13 specific variables: university; scientific area or faculty responsible for the master's degree; name of the master's degree; official website link; master's degree objectives; curricula; duration; university credits; learning methodology; presence or absence of internships; qualification obtained with master's degree; languages required; and enrollment fee. We always bore in mind that some universities might not have similar master's degrees, while others might offer more than one in disciplines similar to those we considered. Finally, we proceeded with descriptive statistical analysis.

Results

Of the 60 universities analyzed in the data set, 53 are private and 7 public. We found that only 17 of these offer master's degrees in the above-mentioned disciplines. As each of the 17 universities considered offers more than one master's degree in the areas of interest, we have considered and analyzed a total of 58 master's degrees.

The faculty responsible for the master's degree is explicitly indicated in some cases, whereas in others only the reference to the relevant scientific area is given. We found that 37 master's degrees are affiliated to studies in management, economics, business sciences, business and finance; 10 are from engineering faculties; and 1 is from the faculty for the environment. Finally, in ten cases the faculty is not specified on the official website: in four cases it is not detailed, while in six cases it is offered by business schools or higher education schools independent from the faculties present in the university.

As the name attributed to the master's degree summarizes its main contents, we note first of all that none of the names of the master's degrees analyzed indicates a highly interdisciplinary nature with respect to the two scientific areas of interest to us (economics and engineering). Sometimes the name is specified if the path is focused on in-depth study or research. The main contents are summarized in Figure 1.

In particular, there are nine MBAs. In eight cases, the focus is on various management aspects (with project, organizational, strategic or digital features). The focus on economic sciences is the most frequent (ten cases), while the specialization in accounting, business and

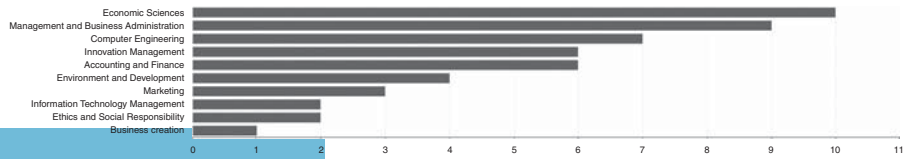

Figure 1.
Main contents of master's degree programs

finance arises in six cases. The focus on business creation appears only once, while business innovation is found in six master's degrees. Marketing (three cases) is always considered in its most innovative aspects, with a particular inclination toward the digital sphere. A focus on the environment and development is present in four courses, while social responsibility is found in two. Regarding the scientific area of engineering, we found nine master's degrees, two of which not only focus on systems engineering and process computation but also specialize in information technology management.

As regards the objectives, there is a great deal of interest in ethics and social responsibility, strategy and innovation, as a bridge to the country's social and economic development. In addition, the Colombian MBAs always deal with the analysis of organizational aspects both in the private and public sectors: the new professional competences deriving from these training paths are considered a strategic resource for the development of the country, both in the business sphere and in public administration. We report Table I, which summarizes the most frequently shared objectives with respect to the scientific areas to which the master's degree is affiliated.

The objectives run in parallel with the development of such competences and skills as analysis, planning, assessment and strategic management; communication, creativity and innovation; proactive leadership; entrepreneurial vision; international vision; integrated vision of the environment; project management; ethics and social responsibility; teamwork; vision of the future: people aware of global change; transparency; value creation; strategic thinking; and contextual intelligence. In particular, we found that communicative and creative competences are offered in four cases, while strategic competences in business and human talent management are included in ten master's degree curricula. Competence in management of integrated quality systems is an objective in six cases and the term "technology" appears in the objectives of nine curricula. Administrative aspects are also present in nine cases. The theme of international or global perspective appears in nine cases.

An interdisciplinary content is mentioned only once, as part of a master's degree in *Medio Ambiente y Desarollo,* held at the Universidad Nacional de Colombia. Business creation and economic growth linked to the development of the potential of Colombian managers and entrepreneurs to support the country's economic growth is included in the objectives of the master's degree in business creation and management proposed by EAN.

Scientific area	Training objectives for students
Administration	Developing a high sense of social responsibility and business ethics, international vision, integrated training not limited to managerial competences but including interpersonal skills
Economics and management	Advancing in economics, which will allow them to apply this knowledge to solve practical and empirical problems in both the public and the private sector
Innovation and business	Promoting innovation in the organizations' management of, applying advanced knowledge, methodologies, applications and optimization of processes
Accounting and finance	Analyzing and extrapolating complex problems affecting the organization and generate innovative models on them
Engineering	Generating and applying IT knowledge to solve problems for the benefit of the organization and for the whole country in a global context
Business creation	Expressing entrepreneurial ideas, but also helping others set up a business in increasingly globalized markets
Marketing	Drawing up strategic proposals through the identification of market opportunities, and capable of understanding the consumer in order to generate value creation
Environment and sustainability	Coordinating and leading the environmental research processes, formulating proposals and projects considering the value of interdisciplinarity and social and corporate responsibility

Table I.
Scientific areas and objectives

Its overall offer of master's degrees is more forward-looking than other organizations and deals with themes similar to those included in our program but it never tackles economics and engineering together.

With a view to supporting and further clarifying the training objectives, the data set includes the curricula field with a link to the detailed study plan, if present, although in five cases this program is somewhat generic. The credits recognized by each master's degree range from a minimum of 35 to a maximum of 64, with an average value of 50 credits. We underline that every Colombian credit corresponds to 48 h of study and class attendance. The value of the credits was recorded in 53 master's degrees, as 5 curricula did not specify this information. With respect to the duration of the master's training paths: 52 master's degree courses last 2 years, that is 4 semesters, with a minimal difference in the number of lesson hours, which are generally over 600; 4 master's degrees are spread over 3 semesters; 2 courses offer the possibility to choose between 2, 3 or 4 semesters, without prejudice to the number of hours provided.

The learning methodology is always based on lectures, enhanced with seminars, workshops, case studies, problem solving and, more specifically, exercises, role-play, round tables, concept maps, and problem-based learning.

Many universities offer the possibility to choose master's degrees delivered either face to face in classrooms or by distance learning. Since our master's degree will take place with lessons in attendance, we have taken into consideration only that kind of master's degrees, while taking compatibility with any work commitments into account. This implies that the timetabled lessons are held in evenings or mornings so as not to impinge on participants' work schedule. Thus, the student can choose, for example, a formula of 2, 3 or 4 semesters depending on the lesson hours making up the course.

The drafting of the final dissertation is associated with a period of work experience, but how and where the practical work experience will take place (in a company, organization or institution) is never specified. Effective work experience, such as an internship, is attributed a maximum of six credits and serves as a verification of learning and an initial involvement within an organizational reality. This is a novelty for the Colombian academic environment, but the great importance of this form of training is now recognized and consolidated on a global scale. The internship adds a strong facet of innovation and originality to our proposal.

The qualification awarded is indicated as *Magister en* and is also given the denomination of master. It should be pointed out that there are only two master's degrees based on international agreements and with a double qualification. Moreover, in most cases knowledge of a foreign language is not an entry requirement: only in two cases this is necessary either because some seminars require it or because the bibliographic material provided is in English. In 33 cases the official language of the master's degree is not specified, while in 23 cases knowledge of Spanish is explicitly requested, assigning a strong territorial characterization to the program. The value of each individual master's degree was difficult to determine: out of 58 master's degrees identified, only 21 declared the cost of the entire master's program and enrollment: in the cases analyzed, this ranged from a minimum of 4,168,000 to a maximum of 79,000,000 Colombian pesos, as in the case of an executive MBA (Prime Business School of the Sergio Arboleda University). The average value is 22,595,000 Colombian pesos.

Conclusions

The development of entrepreneurship and economic growth requires the commitment of various stakeholders, from governments and politicians to higher education institutions. The construction of an entrepreneurial mentality is also supported by redesigned education systems: universities play a crucial role in a dynamic and buoyant economic context worldwide. As highlighted in our literature framework, entrepreneurial innovation is

fostered through collaborative networks, where two features contribute to empowering all the players: co-creation and evolution. Because of this, we consider building a collaborative network between countries at different stages of economic development a fundamental feature. The resulting advantage, in terms of sharing new knowledge, innovation and entrepreneurship, depends on the profile and quality of the network that the organization is part of: collaboration in common training programs regenerates and renews all cooperating countries, regardless of their stage of development. In our interconnected world, with highly competitive markets, a multifaceted approach is needed to develop an entrepreneurial mindset, create business, make strategic decisions, exploit the advantages offered by new web technologies and big data analysis, and tackle entrepreneurial challenges in an innovative and unconventional way. Imagination and creativity together with rigor and scientific knowledge constitute the foundations on which to develop innovative ways of creating and building up successful organizations. The challenge facing universities is to train students in this direction: problem-solving, decision-making, hatching ideas and turning them into products or services, learning one or more foreign languages and being able to interrelate with others are just some of the skills needed to interact in an innovative economy and market.

New types of decision-making processes are now coming into play in organizations: the ability to manage information analytically extracted from data is required in addition to intuition and consolidated experience. In an interdisciplinary perspective, the training path of the master's degree in Entrepreneurial Innovation Management combines core economic and business aspects with innovative features of information technology. The course aims to explore business knowledge together with innovation and the use of computer skills to address emerging issues and trends. In this way, innovative knowledge and competences from the fundamentals of management to applied computer science are developed for the government of change.

Italy and Colombia must reassess and revitalize the educational objectives of their universities, albeit with different methods and in different time frames, by means of a new vision characterized by a capacity for initiative, assuming responsibility, building alliances and networking, interaction and openness between higher education institutes, research centers and companies. Here student entrepreneurs themselves will be able to govern their lives and work projects, as well as develop innovative skills and creative thinking.

In order to design a training course in the field of entrepreneurship and innovation, we first studied the competition by exploring the market offering master's degrees in the Colombian capital, since the project was to be carried out in a Colombian university, as master's degree offered by universities is quite scant there. From the results obtained by studying the market, we have found that the available courses analyzed are always based on educational proposals that combine theory with active methodologies in order to bring students closer to the reality of organizations. The objective is to train professionals who develop skills aimed at innovating and improving business processes or creating competitive businesses in globalized environments. Their weakness, in our opinion, lies in the scientific and sectorial limitation of the educational courses on offer, which does not give sufficient importance to the interdisciplinary training required today by the labor market. Above all, they fail to recognize the importance of developing transversal competences, which does not coincide with the development of specific technical abilities.

In light of the detailed analysis conducted, our master's proposal recognizes the importance of interdisciplinarity and is totally in line with the country's objectives for economic, social and cultural development. First, two disciplinary fields traditionally entrusted to professional figures specialized in either economics or computer engineering are evenly balanced on a single learning path. They inevitably meet in company practice, impacting on organizations' decision-making processes and strategic choices.

Indeed, although the market requires a close interdisciplinarity of these two sectors, the academic world is proving slow to incorporate this and adapt its training courses in a new direction.

Second, in some countries, such as Colombia, the vitality of entrepreneurial activities is not reflected in a high rate of innovation, while in Italy the high rate of innovation is not reflected in an active entrepreneurial ecosystem. Thus, if entrepreneurship and innovation develop independently through renewed training programs, they will be able to find new impetus. Moreover, educational cooperation between countries, that have reached different stages of economic development, can contribute positively to each entrepreneurial ecosystem.

Moreover, the realization of a joint master benefits from fostering future collaborations: it represents an opportunity to connect the pre-existing ecosystem of each university involved, enriching it with new players or designing new research projects.

Enhancing relationships across different countries along an innovative study path means combined efforts in training the next generation of professionals with an international outlook. In particular, our master's degree is recognized in both countries and thus offers the possibility of future work for students beyond national boundaries. In conclusion, our proposal represents a model that could be replicated in different countries other than those involved here.

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