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Case studies in Colombia

This chapter analyses efforts conducted by the Pontifical Xavierian University (Javeriana), National University of Colombia (at Manizales), and ICESI University to support entrepreneurship education, and knowledge transfer. It also studies the connections that the universities have generated with external stakeholders through these activities in the ecosystems of Bogotá, Cali and beyond.

The Pontifical Xavierian University (Javeriana), Colombia

Founded in 1632, as the first accredited institution, the university is private and run by the Society of Jesus. The university has two campuses in Bogotá and Cali and has 22 516 students, 2 000 professors, 235 programmes (13 doctoral programmes, 75 master's degrees, 100 research groups accredited by the Ministry of Science, licensing of 5 technologies 10 patents, 82 patents applied). The third mission and service to the community is an extremely important pillar for the university: it is a key player in local and regional development. Entrepreneurship was included as a strategic priority ten years ago; it is now one of the main objectives of the university.

Entrepreneurship education

The Javeriana Center for Entrepreneurship leads all entrepreneurship activities and provides professional development opportunities for all university students. The centre promotes entrepreneurial culture and development of entrepreneurial skills (incubation and pre-incubation programmes), supports programmes across several faculties, develops entrepreneurial skills workshops and supports the integration of entrepreneurs within national and regional entrepreneurship ecosystems (i.e., to continue developing their entrepreneurial ventures). The entrepreneurship centre has an incubator and currently does not rule out the possibility of having an accelerator, noting there are already a few accelerators in the Bogotá ecosystem in addition to governmental support for entrepreneurs through the *Emprender* fund.

Other initiatives include an entrepreneurship and innovation academic programme, which mentors students through entrepreneurship and innovation projects. The university has a Master of Business Administration (MBA) in Business Financing and courses on intellectual property for scientific careers.

The university's Design Factory leads the development of graduate prototypes, supporting students in the development of a project. The Design Factory also provides consultancy services to companies. This is a bi-directional relationship, as companies within the ecosystem assign challenges to the students. Extracurricular activities include Design Week, and the entrepreneurship centre organises the "Fall in love with problems" week (a hackathon).

Connection with the ecosystem driven by entrepreneurship education

The Centre for Entrepreneurship and Design Factory engage with the government, companies and accelerators. The Innovation Directorate is also well connected to the ecosystem and centralises all research processes to be transformed into innovation, deals with financing for the maturation and commercialisation of technologies and proofs of concept, and generates integration mechanisms with other units for knowledge transfer. These activities have culminated in the Innovation Directorate obtaining a license for a phytopharmaceutical for breast cancer, for example.

Impact of the COVID-19 pandemic on entrepreneurship education

The pandemic had a negative impact on teamwork due to the lack of face-to-face interaction between students. To stimulate this interaction, the Design Factory collaborated in designing respirator projects for hospital patients. Shifting to online activities was also beneficial as it allowed students to have access to international tutors as part of the activities of the entrepreneurship centre; however, opportunities for networking were limited.

Remaining challenges related to entrepreneurship education

The university has identified a number of remaining challenges in the area of entrepreneurship education. There are barriers in engaging entrepreneurs from the social sciences and the university aspires to focus

efforts on bringing together different disciplines. The university is also trying to strike a balance between driving technological innovation whilst ensuring social innovation is created alongside. Finally, the university has identified that entrepreneurs involved in pre-incubation stages sometimes did not have basic needs met. In response, it will be focusing on attracting capital for these pre-incubation early stages.

Knowledge transfer strategy

The knowledge transfer strategy of the Javeriana is a transversal activity. According to the Javeriana's mission, the university works to promote the development of the country, contributing to innovation through creativity, knowledge exchange and technology transfer.

To put in place this strategy, a technology transfer office (TTO) was created in 2012 under the umbrella of the vice presidency of research. One of the goals of the technology transfer office is to promote alignment between the industry and the academy to create integrated solutions that address the needs or challenges that enterprises are dealing with today. The TTO has been also very active in house, working to educate the whole university community, and with different units of the university, researchers, students as well as the administrative team.

The university has a budget that is assigned annually to the vice presidency of research and particularly to the TTO. From this budget, it funded the proof-of-concept call for applications, whilst another part of the budget is dedicated to the TTO's knowledge exchange goals.

Connection with the ecosystem driven by knowledge transfer activities

The university has been working with the government on a national smart specialisation strategy that looks to develop capabilities and technologies in specific areas such as education, health, information and communications technologies, cultural industries and others. The partnership has supported the creation of the Internet of things and Big Data centre, comprising large firms, government and other universities.

Furthermore, the university, through the Innovation Directorate, was one of the 25 winners of iNNpulsaTEC 2021, a government programme put in place to help small companies and start-ups develop business growth capabilities. Through the programme, the university supported companies such as Mantel LTDA (a telecommunication company) and CIEL SAS (manufacturing) with the identification of technological needs, development and support in the implementation of action plans focused on strengthening their capabilities.

The university also has a number of professors who work across different industries; this supports a university-wide understanding of the “real world” needs and challenges facing businesses, with the aim of developing tailored solutions. The university also includes students in its transfer activities, for example through the project *link you*, funded by the European Commission (EC), which aims to strengthen the capabilities of students in the fields of innovation, creativity and entrepreneurship.

Incentives for staff to engage in knowledge transfer activities

The university recognises the efforts of researchers through its teacher regulation framework. An intellectual property policy is also in place, which attributes a percentage of royalties to the researcher if the technology transfer process has been successfully completed.

Remaining challenges related to knowledge transfer activities

Collaboration with external stakeholders has proven to be difficult at times because the national innovation system is in the process of development. National legislation and public policies on innovation are still recent, for instance the Science Technology and Innovation National Policy (2021), or the Intellectual Property National Policy (2021). In addition, more legislation or regulation is needed to help HEIs be more

innovative and to push research and development activities. There is also a need for more financial resources for actors within the innovation ecosystem such as TTOs, research innovations centres or universities. Resources are often project-based, and it is sometimes difficult to keep a continuous stream of projects to support the cost of running the TTO.

National University of Colombia (UNAL) at Manizales

This public university was established 150 years ago and has nine campuses. The Manizales campus hosts a number of different faculties including the science, engineering, architecture and industrial doctorates and has 4 250 students. Each of the nine campuses has incorporated a strategy for entrepreneurship.

Entrepreneurship education

Entrepreneurship and innovation courses are optional for students; however, the undergraduate Faculty of Economics has a compulsory module on “cultural entrepreneurship”. Furthermore, the Faculty of Engineering offers courses on intellectual property, patents and licenses, which are compulsory. Other faculties offer electives and entrepreneurship courses. There is no central co-ordination of the aforementioned courses; each faculty develops its curriculum. However, a project is in the pipeline to set up a unique “chair of entrepreneurship” role. Finally, students are offered workshops on setting up a business, which include negotiation training and business identification.

Connection with the ecosystem driven by entrepreneurship education

The university plays an active role in supporting the ecosystem by, for instance, acting as a host for a support programme for entrepreneurs, which is delivered in conjunction with the chamber of commerce. The Manizales campus also has a science and innovation park, which offers an incubator for students, and professors that already have a minimum viable product. The university offers these entrepreneurs a scholarship as well as continued mentorship and support. There are currently 115 companies engaged with the incubator.

Furthermore, the university has a support offer tailored to industry, facilitated by the science park and the TTO. This includes a sector-specific mechanism for linking research groups with companies in the region of Manizales in the metallurgy-manufacturing cluster, with the objective of understanding specific problems in order to develop solutions and technologies such as the creation of submarines and the development of new construction materials for seismic zones.

The university is also home to support programmes such as *Manizales Mas*, a city programme for entrepreneurship development. The programme is delivered in conjunction with Babson College as a partner. This venture has had limited success, however, due to a lack of consideration of the characteristics of the region of Manizales or the level of industrialisation of the region. Finally, the university participates in Santander’s RedEmprendia initiative, a network of universities, which promote innovation and entrepreneurship practice.

Impact of the COVID-19 pandemic on entrepreneurship education

Students experienced some issues in accessing virtual classes and incubation spaces; however, services are gradually reverting to the usual state. The innovation park, on the other hand, is continuing to deliver its activities virtually. These include counselling support for entrepreneurs and virtual resilience workshops for entrepreneurs and students.

Knowledge transfer strategy

The university encourages a continuous relationship with the business community. The UNAL Manizales campus has a clear mission and vision for its knowledge transfer activities, through which the university aims to contribute to solving global, national, regional and local problems and interacts with a range of stakeholders to transfer knowledge. It has one knowledge transfer office the Directorate of Innovation (Dirección de Innovación) responsible for research, knowledge transfer and extension activities. This office aims to connect academic and research work with local and regional stakeholders (UNAL, 2022^[1]).

Connection with the ecosystem driven by knowledge transfer activities

The university connects with stakeholders in many ways. It offers:

- Consulting and advisory services as well as auditing and evaluation of programmes and policies.
- Continuous education programmes for professionals.
- Programmes for students, including an internship programme. Students also provide services to the community such as legal assistance or psychological support.
- Social extension. The university finances programme and projects of high social impact, which strengthen links with various sectors of society in search of social inclusion of vulnerable communities.
- International co-operation projects (ICP). Through academic, scientific, cultural and sports co-operation activities, the university contributes to the exchange and transfer of knowledge and skills with other countries.

The university also collaborates with the industry in the following sectors: health and care, biotechnology, information and communication technology, agro-industry and energy, among others. In addition, the university collaborates with regional, national and international universities and centres devoted to research, innovation and transfer technologies. Local and business actors carry out some teaching and research activities. However, stakeholders reported during the interview process that they wish to have more professionals involved.

Incentives for staff to engage in knowledge transfer activities

All staff aims to be involved in collaborating with external stakeholders. The research and extension office promotes meetings and interactions with the business community to facilitate knowledge transfer. The institution promotes wage increases regarding knowledge transfer activities.

Remaining challenges related to knowledge transfer activities

The most significant obstacle is to change the industrial and business community culture concerning the research and innovative temporal pipelines. They want cheap and fast solutions. To overcome the obstacles, some public regulations should be revised concerning spin-off and patent procedures.

ICESI University

ICESI is a young, private university in Colombia, created by the business community. It started as a business school and evolved into a university by opening up new faculties in areas such as health and social science. It is a medium-sized HEI with 7 000 students on one campus.

Entrepreneurship education

In 1995, ICESI created the Entrepreneurship Development Centre (CDEE), which sits in the business school but offers courses to students of all faculties. There are mandatory entrepreneurship courses for undergraduate business and engineering students, in which they gain practical hands-on experience in start-up creation and ideation. The business school also runs an MBA and a new master's programme in entrepreneurship. To teach these courses, ICESI has a team of professors who are completing their PhD in entrepreneurship, who can train and mentor students.

In addition, the CDEE runs a new programme for researchers and PhD students to gain entrepreneurial skills and understand the pace of the market. These courses are meant to change academics' mind-sets and find market-application solutions to their research.

The university reported that these entrepreneurial activities had an important impact on students: according to their research, 70% of their alumni have started an entrepreneurial venture after graduating and 42% have conducted a business innovation.

Connection with the ecosystem driven by entrepreneurship education

ICESI University connects with other actors in the ecosystem through entrepreneurial activities, such as the “*Empredeton*”, a workshop run by iNNpulsa, the national agency supporting entrepreneurship. ICESI encourages its students to participate in this workshop, where they can meet other aspiring entrepreneurs and gain more knowledge about entrepreneurship (iNNpulsa Colombia, 2019^[2]). The university's entrepreneurship centre has also created alliances with other centres in the region of Cali (Cauca Valley) and works on innovation programmes with the business community. It participates in a leadership programme in the region Leaders of the Pacific (*lideres del pacifico*), financed by the United States Agency for International Development (USAID) and which aims to train new entrepreneurial leaders in the region. More importantly, the CDEE offers incubation services to entrepreneurs in Cali who are not university students.

Impact of the COVID-19 pandemic on entrepreneurship education

ICESI reported during the interview process that it managed the transition to online activities in a rapid manner. The incubation programme was not closed and continued online. Some small- and medium-sized enterprises (SMEs) and entrepreneurs struggled to adapt, but most accelerated their transition to the digitalisation of their activities. Their master's programmes and courses on entrepreneurship were also provided online throughout the pandemic.

Remaining challenges related to entrepreneurship education

During the interviews, stakeholders reported that entrepreneurs were facing some challenges in understanding how the universities and the government could help them through their journey. Since government institutions often change, there are no stable interlocutors, which make it difficult to maintain a stable partnership.

Knowledge transfer strategy

The university has two specific strategic objectives that foster knowledge exchange activities:

- Increase the impact and relevance of the university research.
- Contribute to social inclusion, economic development and social care for the environment.

The university has put in place a specialised unit responsible for accompanying the strategic management of research and technology transfer. Originally a business school, the university opened a research department ten years ago and has been doing research that responds to the needs of the firms located in the ecosystem (specialising in biotechnology, environmental sustainability and circular economy). Every year the university organises an internal call to finance knowledge transfer proposals. All university researchers can participate and submit their proposals to the university, which evaluates the project following specific criteria (type of collaboration/research, recipient [NGOs, firms], compliance with United Nations Sustainable Development Goals).

Connection with the ecosystem driven by knowledge transfer activities

ICESI has its main area of influence in southwest Colombia; this includes the Pacific region and the city of Cali. As a university with different faculties, specialised centres and offices, several activities are carried out with different social communities and private or public entities. For instance, ICESI has a close relationship with *Fundación Valle del Lili* in Cali, considered one of the best hospitals in Latin America, and the ICESI Faculty of Health does collaborative work with the hospital (research and teaching). In addition, the hospital carries out collaborative research with other faculties, such as the Faculty of Engineering, for the creation of medical devices. ICESI also has a close relationship with *Tecnoquimicas*, one of Colombia's biggest pharmaceutical company located in Cali. The Faculty of Natural Sciences carries constant collaborative work at a research and educational level with this company.

The CDEE (that fosters entrepreneurship within the university) has an active role in the local entrepreneurial ecosystem. It has co-ordinated different accelerating programmes for local start-ups and programmes focused on the development of SME competitiveness.

ICESI collaborates with external structures supporting knowledge transfer. For example, it has an alliance with REDDI, a technological regional agency of the Cauca Valley, whose objective is to solve business challenges based on specialised technological knowledge, promoting innovation and competitiveness. In addition, it collaborates with companies and other institutions in the development of software or specialised knowledge-based products stemming from research projects.

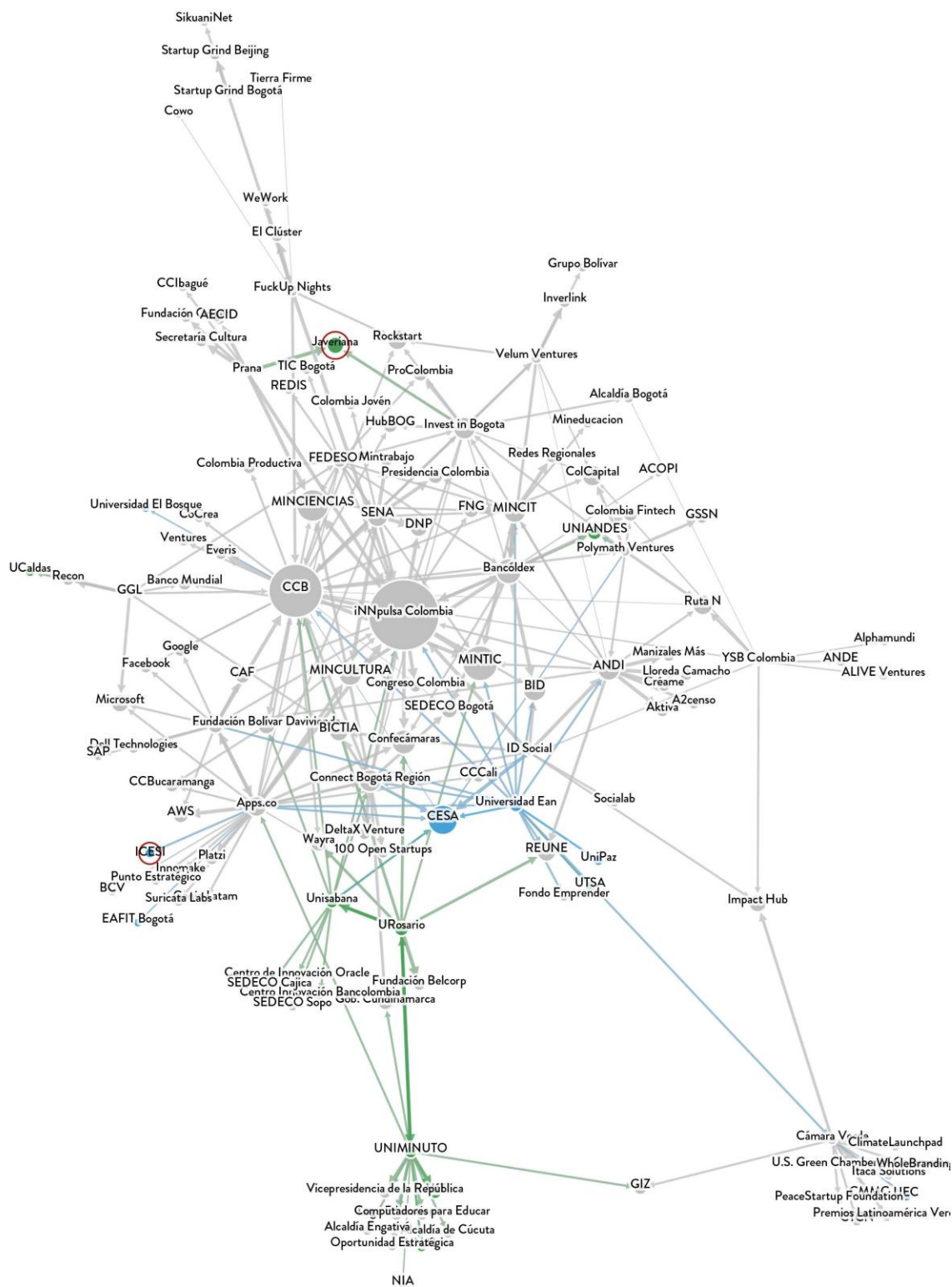
Remaining challenges related to knowledge transfer activities

The university reported having different national and regional interlocutors, which sometimes presents an obstacle to the HEI, as the lack of co-ordination between the different levels of government makes it difficult to have a comprehensive collaboration strategy. In addition, while there is an effort carried out by the university leadership to support applied research that can be used by external stakeholders, often researchers submit research proposals without linking their research to potential beneficiaries. There is a need to build a stronger knowledge transfer culture.

Ecosystem analysis of Bogotá and Cali and the role of ICESI and the Javeriana

As evidenced by the analysis carried out by Global Ecosystem Dynamics, with the support of IDB and the Pacific Alliance on the innovation-driven entrepreneurial economic ecosystems of Bogotá, the universities ICESI and Javeriana play a role in the ecosystem, although it appears to be rather marginal compared to other actors.

Figure 5.1. Ecosystem analysis of Bogotá and the role of ICESI and the Javeriana



Note: This figure provides a visualisation of the collaborations between actors of the economic ecosystem of Bogotá with a node size dependent on the number of mentions by other participants and the strength of said mentions (weighted in degree), highlighting in blue the universities categorised as Enablers, those focusing primarily on education and capacity building, and in green the universities categorised as Knowledge Generators, those focusing primarily on research and the development of new technologies. These visualisations, along with the interpretation of each node's centrality metrics, allow for the analysis of the positioning of universities mentioned within their innovation-driven entrepreneurial economic ecosystem.

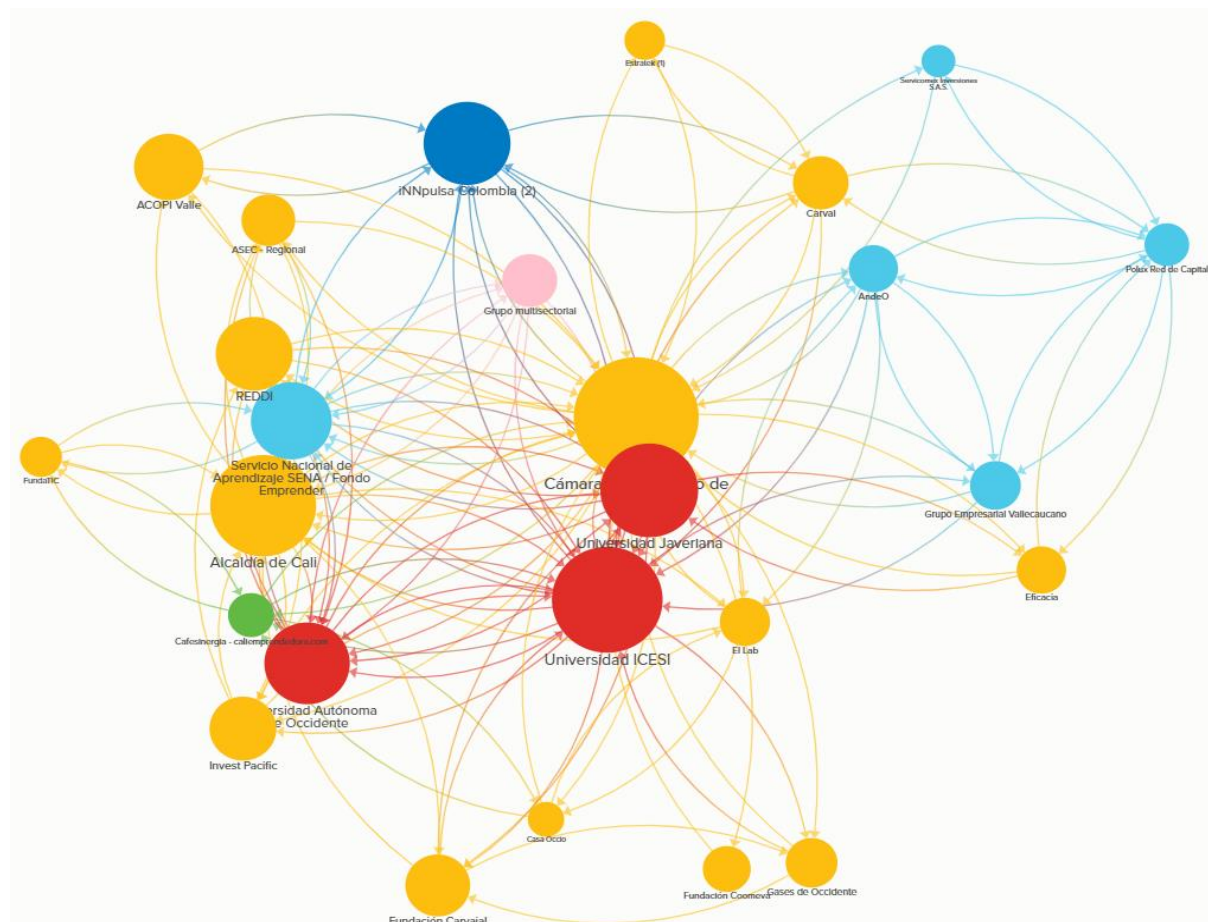
There could be a dissonance between what the university sees as its presence in the ecosystem and what this independent mapping exercise finds. Data collection for each ecosystem was conducted by first identifying as many actors as possible through desk research, which were in turn invited to attend a workshop on strengthening innovation-driven entrepreneurial economic ecosystems and fill an online survey regarding their social dynamics with other actors.

Source: Tedesco, M. (2022^[3]), "How and why to study collaboration at the level of economic ecosystems", *D-Lab Working Papers: NDIR*, MIT D-Lab.

In the Bogotá innovation-driven entrepreneurial economic ecosystem (Tedesco et al., 2021), 16 universities were identified: nine knowledge generators and seven enablers. Of these, none stands out as "gravitational centres", taken by the College of Higher Administration Studies, the best-positioned university in the structure according to the metrics shown in the sociogram. In general, a low involvement from all the universities is shown in this ecosystem. So long as ICESI and the Javeriana can be visualised within the structure, their influence appears to be marginal. The National University of Colombia (Manizales Branch) does not appear, which may be explained by the fact that the institution is not in Bogotá.

The analysis of the ecosystem of Cali conducted by the Inter-American Development Bank (IDB) shows however that ICESI is an important actor in Cali with strong ties with local actors (see Figure 5.2). ICESI runs two business-oriented programmes: i) Alaya, which provides free assistance (in business consulting and basic knowledge) to help entrepreneurs to start up, run and grow a business; ii) Propyme, which provides paid advisory and consulting services to companies that have been already established for 5 to 20 years but that are in the process of growth and expansion. ICESI acknowledges that Cali Chamber of Commerce, iNNpulsa Colombia, Alcaldía de Cali and other universities are the actors of the local ecosystem with whom they have main strong relations. They consider that the Cali ecosystem is at an early stage of development and that it needs more articulation between the most important actors. According to ICESI, the main challenges of the Cali ecosystem are related to the generation of deal flow: in their opinion, the Cali ecosystem lacks public financing in the incubation stage and lacks training for potential founders.

Figure 5.2. Ecosystem analysis of Cali and the role of ICESI Colombia



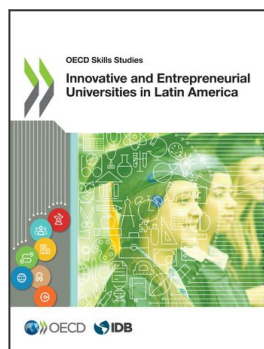
Note: Actors included serve exclusively to innovation-driven start-ups. This figure shows the relations between actors that are either informal or formal for actors who serve innovation-driven start-ups but who can also serve any other type of start-up. Each circle represents one actor and each arrow connecting two circles represents a relation between two actors. The colours represent different types of actors: universities are represented in red, government agencies in blue, financiers in light blue, service providers (consulting, mentoring, incubation, acceleration, etc.) in orange, private sector in pink and media in green. The size of a circle is determined by the eigenvector of the actor, which refers to the centrality of the actor in the network (how well connected an actor is to other well-connected actors); larger circles denote higher eigenvectors or more central actors.

To prepare the network analysis, Goñi and Gonzales (2022^[41]) also conduct in-depth interviews with the most relevant actors in each ecosystem. These interviews go into detail about the business model of each actor, their specific interactions with the ecosystem, their opinion about the ecosystem development and their perception of what opportunities exist for public interventions to further dynamise their ecosystems.

Source: Goñi and Gonzales (Goñi Pacchioni and Gonzales, 2022^[41]).

References

- Goñi Pacchioni, E. and A. Gonzales (2022), “Ecosistemas innovadores de emprendimiento en América Latina”, Banco Interamericano de Desarrollo, Mimeo. [4]
- iNNpuls Colombia (2019), “El taller creativo “Empredetón” llega a Barranquilla este 19 de septiembre”, <https://innpulsacolombia.com/innformate/el-taller-creativo-empredeton-llega-barranquilla-este-19-de-septiembre>. [2]
- Tedesco, M. (2022), “How and why to study collaboration at the level of economic ecosystems”, *D-Lab Working Papers: NDIR*, MIT D-Lab. [3]
- UNAL (2022), *¿Qué hacemos?*, National University of Colombia - Manizales Branch, <http://extension.manizales.unal.edu.co/acerca-de/que-hacemos/>. [1]



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