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Case studies in Chile

This chapter analyses initiatives conducted by Adolfo Ibáñez University and the Pontifical Catholic University of Chile 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 ecosystem of Santiago de Chile and beyond.

Adolfo Ibáñez University (UAI), Chile

The UAI is a private institution created in 1988. Originally a business school, a Faculty of Engineering was added in 1996. It has three campuses (in Peñalolén, Santiago, Las Condes, Santiago and Viña del Mar) and eight faculties: engineering, science, business, liberal arts, government, law and psychology. It is a small to mid-sized university, with 3 400 undergraduate and 800 postgraduate students. It does not receive funding from the government but is funded through the private foundation Fundación Adolfo Ibáñez. Entrepreneurship is one of the six key values of the university along with critical thinking. The Faculty of Engineering and sciences has developed a strategic plan focused on orienting research and knowledge transfer for sustainable growth in areas that are important for Chile such as energy, space exploration, water and natural resources and mining.

Entrepreneurship education

Currently, there are discussions about creating interdisciplinary programmes to mainstream entrepreneurship education but there is already a master's programme in innovation run by the Faculty of Economics that is open to everyone. There are also master's programmes in technological entrepreneurship and sustainable entrepreneurship.

The Faculty of Engineering has its own design lab: a 100 m² facility that enables prototype development and laser printing. The Start-up School project in the Faculty of Engineering and Sciences:

- Aims for students to discover their calling and develop science-based start-ups.
- Builds synergies within the innovation ecosystem which has a data observatory, is working with Google, Microsoft, Huawei and Icare, and partners with CORFO, the state agency that supports entrepreneurship, to have students participate in the Start-up Chile programme seed accelerator.
- Employs three pillars: building skills and abilities (entrepreneurship mindset), building a local ecosystem and building a strong connection with Chile and the rest of the world.
- Has a methodology for entrepreneurship class in Start-up School which follows design-thinking and methodology of active learning (workshops in class and teams: identifying a problem and focus on the solution).
- Has an engineering curriculum where students in the fifth year are encouraged to do internships in a company in order to get into the Start-up School (and a third of students participate in this track).

Connection with the ecosystem driven by entrepreneurship education

The faculty also has a data observatory whose mission is to process, store and make available data in order to contribute to the development of innovation. The Ministry of Science, Technology and Innovation, as well as Amazon Web Services, sponsor the observatory.

The university is creating its own incubator but does not intend to get government funding from CORFO because they have enough private funding. The institution is also building a network of mentors. Additionally, angel investors are involved as interest grows in start-ups in the early stages.

For extracurricular activities, the university engages with hackathons, initiatives from the government, and Amazon and Huawei organised hackathons and data-driven business models to fight climate change. The Faculty of Engineering organises a contest in partnership with Santander Bank.

Remaining challenges related to entrepreneurship education

The university would like to continue its international expansion, especially in Latin America, creating more linkages and becoming a leading university at the regional level in terms of entrepreneurship development.

The university needs to improve its governance in order to mainstream entrepreneurship and the entrepreneurial and innovative agenda across all faculties. The technology transfer office (TTO) should be strengthened.

Knowledge transfer strategy

Technology transfer is mentioned in the university's institutional mission and development plan. To implement the knowledge transfer strategy, the UAI has chosen to set up a TTO at the central level and then create centres at the faculty or school level. The specialised centres of the different schools and faculties of the UAI cover different areas and combine research, continuous education, and extension and technology transfer activities. These centres allow the university's interaction with different communities and the construction of a bidirectional and mutually beneficial relationship in areas such as energy, mining, finance, entrepreneurship, public policy, urbanism, culture and heritage.

Connection with the ecosystem driven by knowledge transfer activities

The UAI Faculty of Engineering of reported working with the Integrated Centre for the Piloting of Mining Technology (CIPTMIN), a not-for-profit corporation which works to develop innovative technologies for the mining sector. The university's researchers are working with CIPTMIN to develop technology solutions for mining companies, such as technologies for smart mining and technical solutions for small-scale mining. This co-operation is essential in responding to the needs of the market since CIPTMIN helps to prepare the technological readiness of the technology and research developed by the Faculty of Engineering. The university also works with regional authorities of the sixth region to attend to the needs of the mining sector. Researchers are collaborating with technical schools and miners to help them use more developed technological solutions.

Incentives for staff to engage in knowledge transfer activities

The university ambitions to gradually enrich the training of students with technology transfer activities, as well as those academics undertaking applied research. Incentives currently vary according to the school or faculty and each faculty has a performance evaluation for their staff, which include technology transfer indicators.

Remaining challenges related to knowledge transfer activities

What has been a disincentive in the past is that the universities' internal accreditation processes did not consider innovation and linkage with the external stakeholders. There were only incentives for scientific publications but not for other contributions such as the generation of intellectual property (IP), technological contracts and spin-offs. The university is working to create a new set of indicators.

As a private university, there are few important regulatory barriers but, as any university, it faces some barriers when interacting with businesses (priorities and time horizons are different). There is no established culture of collaboration between academia and business: contacts are rather sporadic and ad hoc (project-based).

To push new technologies onto the market, the university reported lacking expertise in the protection of IP and commercialisation. The university also lacks resources to fund knowledge transfer and, in an immature innovation ecosystem (with a low degree of collaboration amongst actors or of investment in research and development), this is a major obstacle, as the university would need resources to scale up much of its activities in order to stimulate innovation.

Pontifical Catholic University of Chile (PUC)

This private university that has 5 campuses (4 in different districts of Santiago and 1 in the city of Villarrica) and 18 faculties covering multiple disciplines (social sciences, engineering, arts, architecture, law). The university focuses on innovation, digitalisation and service to the community.

Entrepreneurship education

In the School of Engineering, there are mandatory entrepreneurial courses for all undergraduates and an “innovation challenge” for first-year students which encourages design-thinking to find solutions to a problem or prototype design. There is also a practical course for third-year students using the lean start-up methodology, during which students must develop an entrepreneurial project. The School of Design also has a “challenges to business creation” course in which teams of students find opportunities for new businesses. The business school has courses on design-thinking and social innovation and offers an MBA which includes design-thinking for business creation and social entrepreneurship.

Connection with the ecosystem driven by entrepreneurship education

The university’s Innovation Center UC (*Centro de Innovación UC*) aims at promoting entrepreneurship throughout the institution, through events, networking and projects with the public and private sectors. It is linked to the Research Vice-rectorate. The centre was created thanks to a donation from the Angelini group (USD 15 million) and is now self-funded. It has its own building, which helps to congregate all initiatives, offers services to companies to help these scale up their innovation potential and is currently working with biotechnologies (such as Sinovac) and telecommunications companies. The centre connects the companies with research and data analytics teams within the university and is looking to expand these services to other countries in Latin America. It is currently collaborating with Colombia, Mexico and Peru, in particular with the University of The Andes and the Tecnológico de Monterrey. In addition, as a part of the innovation centre, Incuba UC is a programme that supports entrepreneurs that already have a project (currently 120).

Impact of COVID-19 pandemic on entrepreneurship education

During the pandemic, the university engaged in virtual mentoring initiatives, which allowed for more participants since there were no limitations on space. It has been especially challenging for the School of Design as this required some creative thinking, but the situation has since improved as it is offering hybrid-learning courses.

Remaining challenges related to entrepreneurship education

The university will be focusing its efforts on tackling a number of development challenges in the area of entrepreneurship education. As with large proportions of higher education institutions (HEIs) adapting to current and future demands, the university is working to manage its exposure to market resources. It receives funding from both the public and private sectors (Santander) but still has some dependence on market forces. Private sector funding tends to be allocated to determining projects, providing the university with a temporary income, as opposed to public funding which represents a more continuous source of revenue.

Additionally, given the relevance of its respective functions in entrepreneurship education, the university recognises that there are benefits to improving dialogue and exchange between the TTO and the innovation centre.

Knowledge transfer strategy

As a large university, faculties are granted a high degree of autonomy. Each faculty has its own mission, rules and evaluation procedures for academics. Knowledge transfer is no exception. Strategic priorities are set by the central administration, which created a Department of Development and Transfer, but each faculty sets its own priorities and organisational structures.

During the interview process, stakeholders discussed knowledge transfer activities carried out by the university's School of Engineering and the School of Business Administration. Knowledge transfer is an integral part of the School of Engineering's vision and mission. The school has established structures and programmes to promote knowledge transfer, such as the Research and Innovation Directorate and the Industry Liaison Office, whose mission is to serve as a link between academia and the public and private sectors to transfer knowledge and technologies.

The university's business school also conducts knowledge transfer activities. A Public Commitment and Engagement working group has strategic collaboration objectives, such as fostering social responsibility in students and participating in public debate.

Connection with the ecosystem driven by knowledge transfer activities

The university reported connections with the business sector and the government. For instance, since 2015, the School of Engineering has carried out a transformative strategic plan, Engineering 2030, with the support of the Production Development Corporation (CORFO, Ministry of Economy). The main goal of the 2030 engineering project is to contribute to the integral and economic development of Chile through renewing education, research, entrepreneurship and global connections.

The university has also been active during the pandemic, providing support to external stakeholders. The Faculty of Engineering participated in the COVID-19 National Board and contributed with solutions in all sectors affected by the pandemic, including in the health, social and economic spheres. Based on new developments or its focus on technologies, in the first semester of 2020, the PUC School of Engineering generated more than 20 innovative scientific-technological solutions to support the management of the pandemic, from COVID-19 detection kits, disinfection equipment and methods for monitoring ventilation conditions that allowed the reopening of restaurants.

The business school is more focused on helping entrepreneurs. There are several examples, such as consultancy work carried out by professors of the faculty, the Innovation and Future Festival and seminars gathering entrepreneurs and students to develop innovative ideas.

Incentives for staff to engage in knowledge transfer activities

It is not mandatory for researchers to participate in knowledge transfer activities; however, those who take part in these activities receive financial compensation as follows:

- Inventors are paid royalties, in the case of licensed technologies.
- Researchers with spinoff companies may request to, to dedicate time to the company (for a period of two years).
- Researchers are rewarded on the annual TTO anniversary.
- Faculty regulations recognise technology transfer and spinoff activities for evaluation of research.
- The university has funds for IP and seed funding.

Remaining challenges related to knowledge transfer activities

- Stakeholders reported a number of challenges remaining in the development of knowledge transfer activities. Principally, they noted a need for greater incentives, both for industry, in the sense of industry understanding the importance of research and development to stay competitive, and for academics, to be attracted to and remain informed of developments in applied science over pure science.
- There is a clear ambition to embed trust building into activities. Lack of trust between stakeholders has been identified as a limiting factor: it is particularly hard to establish when there has been no previous contact between stakeholders. Stakeholders believe that efforts to align language and expectations between stakeholders would also support trust building.
- New opportunities for collaboration should be created to decrease intrinsic research risks.
- Harmonising knowledge transfer activities across faculties within the university would make for a more unified image.

Ecosystem analysis of Santiago de Chile and the role of the UAI and the PUC

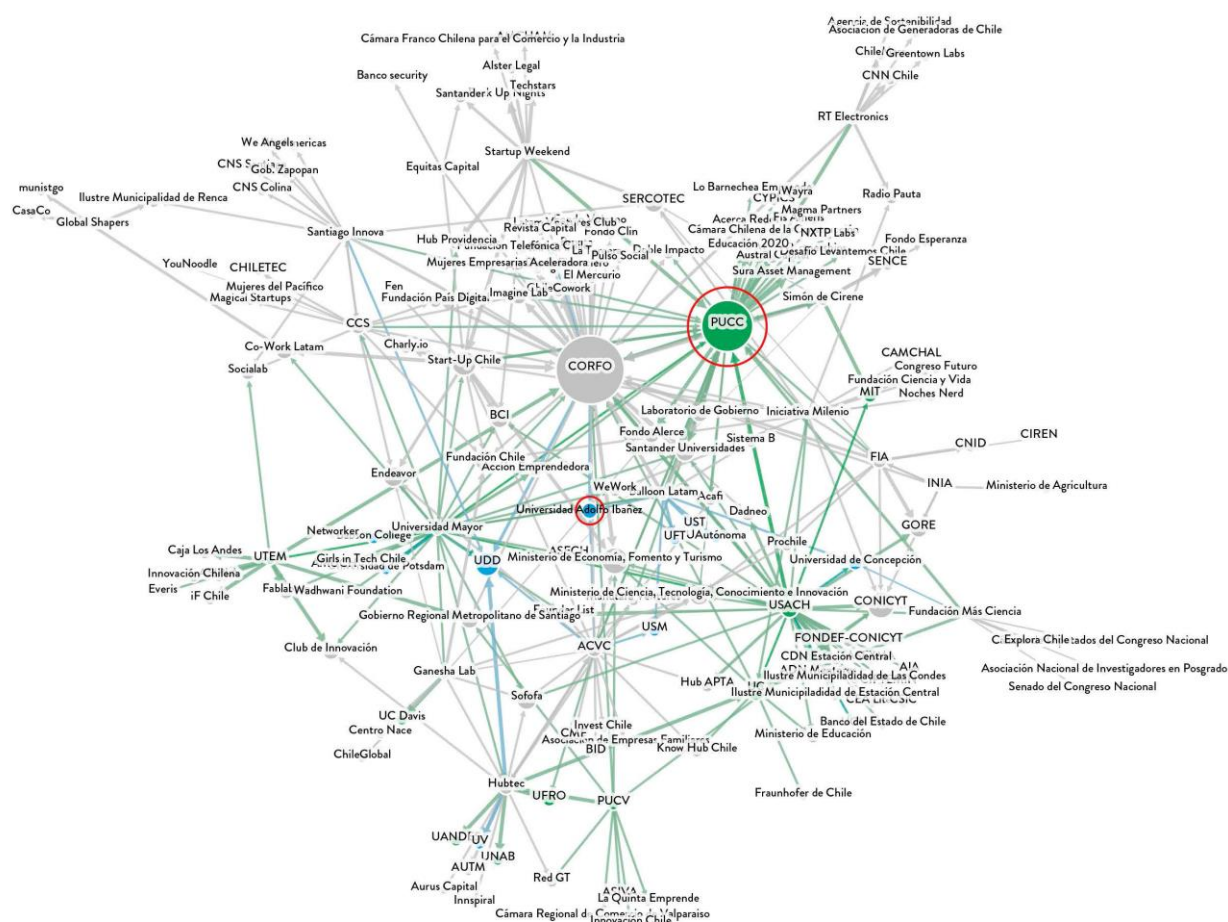
As evidenced by the analysis carried out by Global Ecosystem Dynamics, in collaboration with MIT D-Lab and supported by Santander Universidades, on the innovation-driven entrepreneurial economic ecosystems of Santiago de Chile, the UAI and the PUC play a role in the ecosystem.

This ecosystem presents a vast number of universities, with 12 enablers and 11 knowledge generators. From these, only the PUC shows a solid positioning in the study (Tedesco, 2022^[1]) it is considered to be a gravitational centre with high intensity and mentioned 13 times by correspondent actors.

In contrast, the UAI presents a smaller influence in Santiago de Chile's innovation-driven entrepreneurial economic ecosystem, locating itself on the periphery of it.

The PUC is classified as a knowledge generator and the UAI as an enabler.

Figure 6.1. Ecosystem analysis of Santiago de Chile and the role of the UAI and the PUC



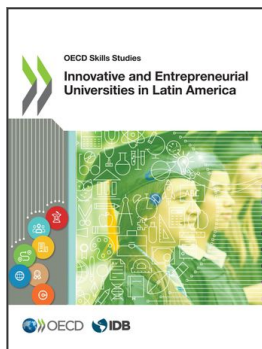
Note: This figure provides a visualisation of the collaborations between actors of the economic ecosystem of Santiago de Chile with a node size dependent on the number of mentions by other participants and the strength of said mentions (weighted in degree), highlighting in blue the universities categorised 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^[11]), "How and why to study collaboration at the level of economic ecosystems", *D-Lab Working Papers: NDIR*, MIT D-Lab.

Reference

- Tedesco, M. (2022), “How and why to study collaboration at the level of economic ecosystems”, [1]
D-Lab Working Papers: NDIR, MIT D-Lab.



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