LISTO TOOLKIT FOR ENTREPRENEURIAL UNIVERSITIES

LISTO

The LISTO Project (2020)

LISTO Toolkit for Entrepreneurial Universities

LISTO

CONTRIBUTORS AND EXPERTS WHO CAN GIVE FURTHER ADVISE ON THE TOPIC

Uppsala Universitet, Sweden (UU)

Ernesto Gutíerrez, Collaboration Manager, Uppsala University Innovation

Göran Lindström, Associate Professor, Department of Civil and Industrial Engineering

Philipp Baur, Project Coordinator, Division for Internationalisation/ Unit for Global Partnerships

University of Groningen, The Netherlands (UG)

Aard Groen, Dean, University of Groningen Centre of Entrepreneurship, Professor of Entrepreneurship and Valorisation

Olga Belousova, Assistant Professor Entrepreneurship

Aniek Ouendag, Coordinator, VentureLab North

Universidad de Valladolid, Spain (UVA)

Enrique Baeyens Lázaro, Professor School of Industrial Engineering, Institute of Advanced Technologies (UVa), General Director PCUVa

Miguel Ángel Nuevo Pérez, International Relations Office

Beatriz Nuevo Pérez, International Relations Office

Parque Científico Universidad de Valladolid (UVA)

Lourdes Rodriguez Blanco, Projects Director

Carolina Delgado Sahagún, Innovation-Transfer Knowledge

Universidade Federal de Pernambuco, Brazil (UFPE)

José Roberto Ferreira Guerra, Coordinator of Entrepreneurship and Incubation of the Innovation Affairs Office

Solange Coutinho, Associate Professor of the Design Department

Sérgio Ribeiro de Aguiar, Adjunct Director of the Innovation Affairs Office (at the time)

Geraldo Leite Maia, Coordinator of Technology Transfer of the Innovation Affairs Office

Universidade de São Paulo, Brazil (USP)

Marcos Nogueira Martins, Head of USP Innovation Agency, Physics Professor, Institute of Physics

Liliam Sanchez Carrete, Head Assistant of USP Innovation Agency, Finance Professor, FEA Business School

Liliane Sartorio Ayala, Collaborator at USP Innovation Agency, PhD candidate Business Administration at FEA

Universidade Federal do Rio Grande do Sul, Brazil (UFRGS)

José Luis Duarte Ribeiro, Senior Technological Development Officer

Marcelo Lubaszewski, Director of Zenit Science Park

Sabrina Pojo, Coordinator of the University-Industry collaboration Office

Universidad Nacional del Litoral, Argentina (UNL)

Germán Rossetti, Associate Professor, School of Chemical Engineering

Oscar Quiroga, Titular Professor, School of Chemical Engineering

Leticia Arcusin, Adjunct Professor, School of Chemical Engineering

Melisa De Greef, Adjunct Professor, School of Chemical Engineering

Luciana Tottereau, Coordinator of Entrepreneurs Program of the Technological Transfer Office

Universidad Nacional de Córdoba, Argentina (UNC)

Franco M. Francisca, Undersecretary of Innovation, Transfer and Technological Linkage

Silvia Aisa, Director of the Innovative Technologies Management Specialisation Program, School of Economics.

Andrés Matta, Secretary of Science, Technology and Internationals Relations of the Faculty of Economic Sciences

Universidad Católica del Uruguay, Uruguay (UCU)

Daniel Perciante, Vicerector for Research and Innovation, Professor, Exact and Natural Sciences Department

Magdalena Giuria, Director for Innovation and Entrepreneurship and Adjunct Professor, Innovation and Entrepreneurship Ithaka Center

Catherine Krauss, Associate Professor, Innovation and Entrepreneurship Ithaka Center

Florencia Clemente, Adjunct Professor, Innovation and Entrepreneurship Ithaka Center

Universidad ORT Uruguay, Uruguay (ORT)

Enrique Topolansky, Director, Center for Entrepreneurship & Innovation

Laura Diaz-Arnesto, Coordinator of Academic Projects, International Office

CONTENTS

INTRODUCTION

The role of Higher Education in society and the economy is transforming fast. In addition to the traditional mission of knowledge generation and teaching, there is an increasing focus on how universities contribute to socio-economic development through innovation in research, knowledge exchange, teaching and learning, governance and external relations (Etzkowiz, 2008; Guerrero et al, 2015; Gibb et al, 2009). Universities play an important role in addressing some of the world's most pressing challenges and the cross-sectorial implementation of the Sustainable Development Goals (SDGs), an urgent call to action adopted by all United Nations Member States. This requires the ability to collaborate effectively and strategically with the public and private sector (El-Jardali, 2018).

In this context, the concept of entrepreneurial university has emerged as a trending topic. Broadly speaking, entrepreneurial universities are engaged with civic society, try to contribute to societal development in interaction with many actors, teach and support entrepreneurship and stand on the opposite side of the "Ivory tower" university (Etzkowiz, et al, 2019). According to Gibb et al (2013), entrepreneurial universities are

> designed to empower staff and students to demonstrate enterprise, innovation and creativity in research, teaching and pursuit and use of knowledge across boundaries. They contribute effectively to the enhancement of learning in a societal environment characterised by high levels of uncertainty and complexity and they are dedicated to creating public value via a process of open engagement, mutual learning, discovery and exchange with all stakeholders in society - local, national and international. (p. 3)

While innovation and entrepreneurship have become key elements in the mission and strategy of universities, there is less clarity in what it means in practice to be "entrepreneurial". The reasons and purpose why a

university chooses to become more "entrepreneurial" might differ depending on its profile, context and the stakeholders involved. Students might look for help to start their own company or to learn transversal skills to become more employable; academics might look for ways to create not only intellectual but socio-economic impact and to support students in becoming agents of change; companies might look for a partner with relevant knowledge and interest in collaboration; governments and funding bodies have an interest in higher returns on research investments and strong innovation eco-systems.

While each university will have to make its own individual choices on how to foster and define its entrepreneurial character, collaboration between universities can help in this process. This was the premise of the Erasmus+ project LISTO – Latin American and European Cooperation for Innovation and Entrepreneurship (www.listoproject. eu). Between 2017 and 2020, LISTO brought together 10 universities from Uruguay, Argentina, Brazil, Spain, the Netherlands and Sweden and one Technologycal Park to facilitate an exchange of good practices to strengthen collaboration between universities and social and economic environments. The LISTO consortium focused on three specific actions:

1 Testing a tool for university-industry interaction (AIMday);

2 Co-creating an International Virtual Classroom (LISTO IVC Entrepreneurial Solutions in Innovative Global Networks); and

3 Developing strategies and recommendations for strengthening the entrepreneurial spirit in the university.

The group of ten LISTO partner universities could not have been more diverse. Some were founded several centuries ago, while others, mere decades. Some are public, some private. Some have only a few thousand students, some more than one hundred thousand. In terms of profile, there was a range from traditional, comprehensive research universities to more applied, specialized universities. Given

the plurality in background, mission and operation of the participating institutions, it was clear we would need an open approach. Our ambition was to use the international and intercultural differences in the group as an opportunity to learn from each other, and to develop new insights and recommendations fitting the needs and expectations of each partner.

There are a number of frameworks, models and benchmarking tools that define "Entrepreneurial University", e.g. EC-OECD (A Guiding Framework for Entrepreneurial Universities), HEInnovate (probably most used today as a development framework including assessment) or Multi-U-rank (EU-supported instrument which is used as a ranking instrument). The LISTO consortium studied them but decided to develop a simpler, more action-oriented approach in line with the specific interests of the LISTO partner universities.

The Toolkit in the following pages shares our experience and results of working together promoting the entrepreneurial spirit in our universities. Its main purpose is to inform the strategic decision-making processes in the LISTO partner universities to become more entrepreneurial. However, the Toolkit is also aimed at a broader audience, for instance universities interested in developing and implementing similar international collaborations.

The LISTO Toolkit for Entrepreneurial Universities consists of three parts:

Chapter 1 gives an introduction into the activities and methods used by the consortium to analyze the entrepreneurial dimension of our universities. We stress that an open and action-oriented approach is key for the success of the collaboration. By putting a methodological emphasis on looking for the entrepreneurial spirit in our universities, we highlight the importance of activities which allow for peer-learning and practical exchange.

Chapter 2 presents the results of our self-diagnosis. The LISTO MESAVAR Approach combines 50 change-oriented essential elements for entrepreneurial universities. While this approach is an expression of the specific context of the LISTO consortium, it serves as an inspiration and reference for other universities, too.

Chapter 3 makes 10 specific recommendations for making the LISTO universities more entrepreneurial. In addition, we supplement the recommendations with a number of good practice examples of the LISTO consortium.

References

El-Jardali, F., Ataya, N. & Fadlallah, R. (2018). Changing roles of universities in the era of SDGs: rising up to the global challenge through institutionalising partnerships with governments and communities. **Health Res Policy Sys**, 16, 38.

Etzkowitz, H. (2008). **The triple helix. University-industry-government. Innovation in action.** Madison: Routledge.

Etzkowitz, H., Germain-Alamartine, E., Keel, J., Kumar, C., Smith, K. N., & Albats, E. (2019). Entrepreneurial university dynamics: Structured ambivalence, relative deprivation and institution-formation in the Stanford innovation system, **Technological Forecasting and Social Change**, Elsevier, vol. 141(C), 159-171.

Gibb. A., Haskins, G. & Robertson, I. (2009). **Leading the entrepreneurial university: Meeting the entrepreneurial development needs of higher education institutions.** Oxford: NCGE.

Gibb A., Hofer A-R & Klofsten, M. (2013). The entrepreneurial higher innovation education institution: A review of the concept and its relevance today. **HEInnovate.**

Guerrero, M., Cunningham, J. A., & Urbano, D. (2015). Economic impact of entrepreneurial universities' activities: an exploratory study of the United Kingdom. **Research Policy**, 44(3), 748–764.

METHODS AND ACTIVITIES: LOOKING FOR THE ENTREPRENEURIAL SPIRIT IN OUR UNIVERSITIES

This chapter proposes a 3-step approach for analyzing the entrepreneurial dimension of universities as a joint activity of a group of universities. The way is the goal here. This means that the intention was to facilitate a series of activities relying on methods that engage the whole group - even if the group is very heterogeneous. In the case of LISTO, we worked with 3 staff from each of the 10 partner universities, with a combination of senior staff (e.g. Dean of Entrepreneurship, Director Innovation Office) and experienced teachers/researchers who are experts not only in their particular subject but also on innovation and entrepreneurship.

Step 1 is about developing a working definition, common understanding and collaborative approach. Step 2 is an in-depth self-analysis of the entrepreneurial dimension of each partner university. Step 3 is a SWOT analysis, identifying the Strengths, Weaknesses, Opportunities and Threats to generate options for action and recommendations.

In the particular case of the LISTO project, step 1 was conducted as a face-to-face workshop in Valladolid, Spain; step 2 was done independently by each partner with the help of a digital survey tool; step 3 was done through video conference and virtual exchange methods as the COVID-19 pandemic made another workshop impossible. For each of the 3 steps, we will present a number of activities and describe the methods and the results of the LISTO consortium

Step 1: Collaborative Design of Analysis

Activity 1: What is an "Entrepreneurial University"?

- Presentations: Each university has 3 minutes to present its particular definition or vision of an entrepreneurial university, with support of one presentation slide.

- Teamwork: Subsequently, groups of 5 participants discuss the different definitions and develop a combined definition (duration 30 minutes).

- Summary: Presentation and comparison of the group definitions.

Result: The LISTO working definition of an "entrepreneurial university":

> **An entrepreneurial university empowers the whole of its community (academic and administrative staff, researchers, students, and alumni) to commit to develop a mindset for knowledge generation, creativity and innovation under uncertainty in order to solve real complex problems and create new opportunities, as the means of adding value to society and contributing to sustainable development, locally and internationally.**

Activity 2: How to measure the entrepreneurial dimension?

- Preparation: Each university presents the strategies it uses, how they are organized and how they encourage an entrepreneurial spirit at the university. Each presentation is structured in four dimensions: 1. Human capital, resources, activities; 2. Strategic management and networking, 3. Environment; 4. Results and dissemination, including specific indicators for analysis. To illustrate the strategic lines, each presentation also includes a good-practice example.

- Teamwork: In groups of 5 participants, partners develop essential elements as indicators for measuring the entrepreneurial dimension of their universities.

Documentation: all indicators are collected and

summarized in a list of essential elements.

Duration: 20-30 minutes each for presentation; 45 minutes for team work.

In the case of the LISTO consortium, we developed a list of essential elements. They provided the basic structure for step 2 of the activities. A refined version of these elements is presented in chapter 2 of this Toolkit.

Step 2: Self-Diagnosis (Questionnaire)

Based on the essential elements, we developed a questionnaire to conduct an in-depth analysis of each partner university. The questionnaire was developed using a web-based survey tool and filled in by each partner. While there exist ranking tools (e.g. Multi-U-Rank) and detailed self-assessment tools (e.g. HEInnovate), the LISTO consortium opted for a simpler, non-ranking self-diagnosis developed by the consortium to reflect the different states of entrepreneurialism of each partner university. Moreover, the LISTO consortium saw a need for a more action- and change-oriented approach.

The scope of this questionnaire is consistent with the objectives of the LISTO project and the organization and philosophy of the partners. In order to examine the entrepreneurial spirit, we defined four areas in the questionnaire to be analyzed quantitatively: general context, internal dimension, ecosystem, entrepreneurship.

Entrepreneurship is the process of innovation that reallocates resources to new opportunities, through the implementation of resources and risk-taking skills. In construction of this questionnaire, we incorporated this approach into the analysis of entrepreneurship as indicated by the participants from each university, taking into account variables related to the ecosystem and the governance of each university.

We have observed that beyond satisfying a need and generating income for the entrepreneur, forges stronger communities for support. It does this through the generation of employment and wealth in its ecosystem and evaluating the scope: the capacity to stimulate the

economy and allow a great change and the social mentality of spreading the spirit of entrepreneurship.

Step 3: SWOT Analysis

The survey-based self-diagnosis of each partner provides the foundation for a joint SWOT analysis. The methodology of step 3 is based on an analysis of the threats, weaknesses, opportunities and strengths in each partner institution. This raises a number of questions and challenges which were discussed subsequently in more detail.

Activity 1: Definition of variables and areas of analysis

Each SWOT analysis will lead to results indicative of the local circumstances and conditions. Conducting the SWOT analysis in a group of universities allows for a comparative examination highlighting not only differences but also similarities and overlaps. This allows us to climb out of the depth of each respective institutional context and be able to look at the "bigger picture" of the entrepreneurial dimension and to generate strategic options. In the case of the LISTO consortium, the comparative part of the SWOT analysis focused on three areas: 1. Internal dimension 2. Environment/ecosystem 3. Entrepreneurship.

Activity 2: Challenges and Questions

Based on the findings of the SWOT analysis (1. Internal dimension, 2 Environment/Ecosystem, 3. Entrepreneurship), we organized three virtual workshops in which each participant contributed with one specific challenge/question.

The goal of this activity was to interpret the SWOT analysis in more detail and come up with some solutions for the questions/challenges. This discussion was action-oriented towards some recommendations that can inform institutional strategy decisions in the future.

The guiding questions were:
- What possible actions or solutions do you see?
- How can you build on strengths to further your aim and strategy?

- What needs to be changed to minimize your weaknesses?

In this interpretation, it is important to think across the boundaries of the SWOT matrix.

- What relationships exist between strengths + weaknesses versus opportunities + threats?

- What internal strength is paralleled by an external opportunity or connected to a threat?

- Which internal weakness is matched by an external threat or external opportunity?

Activity 3: Development of recommendations

Based on the detailed SWOT analysis and the particular challenges/questions, the group identified three main, overarching topics which were of greater significance to the LISTO group. The three challenges were:

1 How can transdisciplinarity become a strategic opportunity for a more entrepreneurial university?

2 How can we improve the internationalization of our entrepreneurs, researchers and innovation office staff? How can we help startups in our local system internationalize funding for their products, services or projects?

3 How to spread the entrepreneurial culture in different technological areas? (Some faculties are more receptive to this type of initiative than others).

As in the previous activity, we organized three separate virtual workshops. The goal was to develop five recommendations each to address the specific question / challenge. The target audience was senior university management to inform future policy development concerning innovation and entrepreneurship. It is important to be as specific as possible by focusing on the Why, What, Who and How. After a collective editing work, we came up with a synopsis of 10 specific recommendations which are presented in Chapter 3 of this Toolkit.

Conclusion

Together we found that despite differences, the LISTO universities share a similar context whose institutional, social and economic strengths support entrepreneurship at the university. The arrival of this cultural paradigm when it comes to innovation has made an impression on society and has become common practice due to the employability of our graduates and the relationship with the ecosystem.

However, the cultural mentality change is still in progress and at different stages of progression that are often affected by socio-demographic characteristics. While all the LISTO universities have adapted well to this new Mindset, some contexts facilitate the stability of entrepreneurship policies more than others. The dichotomy between long and short term, stable and unstable, marks the context of the entrepreneurial university.

Regarding internal government and applying the LISTO experience to the strategic plans of the universities in the form of recommendations, the SWOT analysis found that the university is a leader in entrepreneurship within the regional ecosystem.

The way in which this leadership is maintained and developed concerns not only the synergies established at the local and regional levels but also the organization of the entrepreneurship structures of the university and their regulations. All of these structures are related to the management of funding.

Additionally, it has been shown that entrepreneurship units are more effective when they become a common unit and are able to manage the relationship to all disciplines establishing transdisciplinarity in their spirit of entrepreneurship. Including the analysis of governance and politics of an entrepreneurial university has resolved some of the debates within the university regulations. This has shown the importance of the transdisciplinarity of the organizational units dedicated to entrepreneurship.

Within the ecosystem analysis that was conducted in correspondence with our partners, the relationship between university regulation and knowledge interchange became clear. This interchange with society is providing enough results, according to the SWOT, to consider the ecosystems in which we work as talent attracting centers and as economic development.

In this sense, it has been shown by the SWOT that beyond this level, the growth of the ecosystem should/ must examine internationalization. Thus, the challenge is: to simplify the procedures in relation to the ecosystem and to expand our innovation network internationally.

Regarding entrepreneurship as a unit of analysis, we found strategies and formulas for working together in teaching entrepreneurs (e.g. International Virtual Classrooms), and for reinforcing the value chain that offers skills to our community, including training our trainers.

After the group activity, the SWOT analysis has given us the opportunity to define the target audience for our actions and this may be included as a recommendation when communicating knowledge or innovations.

Finally, dissemination and the transversal importance of Information and Communication Technology (ICT) are supporting the way to the internationalization of the ecosystem.

A more systematic conclusion of the analysis is presented in chapter 2 - The LISTO MESAVAR Approach: 50 Essential Elements for Entrepreneurial Universities.

THE LISTO MESAVAR APPROACH: 50 ESSENTIAL ELEMENTS FOR ENTREPRENEURIAL UNIVERSITIES

The LISTO MESAVAR approach for fostering entrepreneurial spirit in universities is composed of 50 essential elements plus 10 Key Performance Indicators (KPIs). The 50 essential elements are organized in five balanced dimensions, in such a way that each dimension embraces the 10 most important elements in their respective domain. The dimensions of MESAVAR are: (1) Align the Mindset, (2) Prepare the Environment, (3) Engage all Stakeholders, (4) Conduct the Actions, and (5) Deliver VAlue for stakeholders. The 10 KPIs are presented as a sixth dimension, labeled (6) Measure Results.

The logic behind MESAVAR is as follows: the elements of the three first dimensions, (1) Align the Mindset, (2) Prepare the Environment, (3) Engage all Stakeholders, are necessary for (4) Conduct the Actions, which will (5) Deliver VAlue for stakeholders. Next, the use of KPIs in (6) Measure Results will provide the necessary feedback to adjust and improve the actions. Figures 1 and 2 show MESAVAR dimensions and its general logic as an approach for entrepreneurial universities.

MESAVAR dimensions

Align the Mindset for
Prepare the Environment
Engage Stakeholders
Conduct the Actions
Deliver Values to stakeholders
Mesure Results (KPIs)
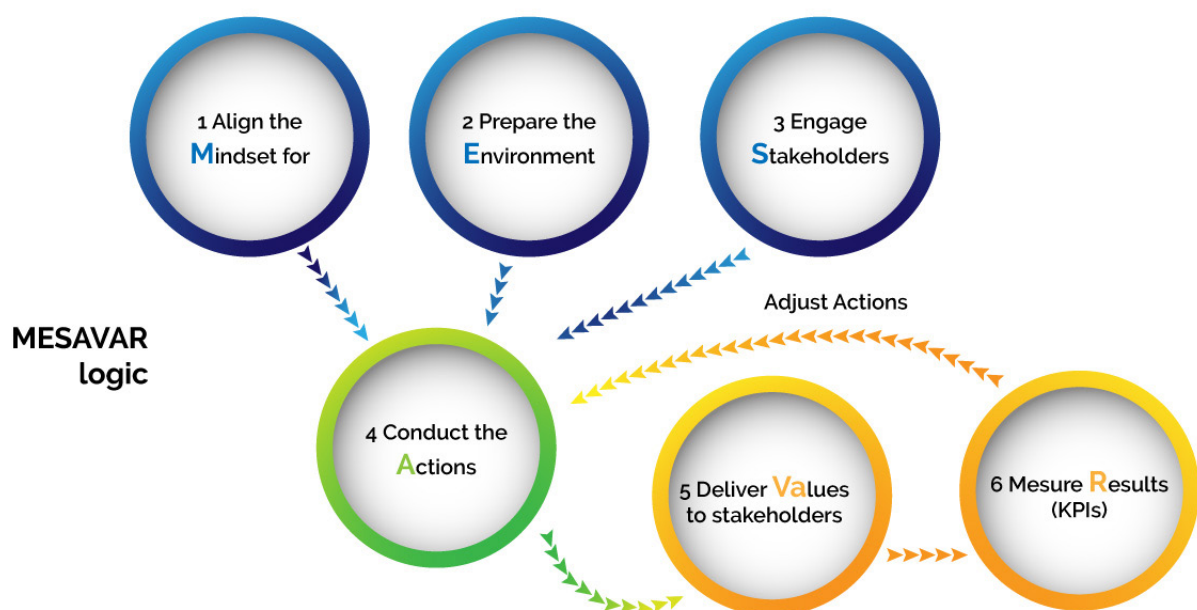
Figure 1: MESAVAR dimensions

Figure 2: MESAVAR logic

The selected elements for each dimension and the KPIs are presented and briefly discussed below.

The first dimension – **Align the Mindset for** – involves establishing an organizational culture conducive to the entrepreneurial spirit. This is achieved by reinforcing some elements as true values of the organization. The 10 essential elements or values selected to comprise the first dimension are: Change, Out-of-the box thinking, Risk-taking, Transdisciplinarity, Collaboration & Co-creation, Sustainability, Internationalization, Global-Local thinking, Transforming the world, and Research, Development & Innovation. The reinforcement of these values is essential to welcome and allow the entrepreneurial spirit to flourish at the university. Change, which implies movement and doing, is at the heart of the entrepreneurs. Out-of-the-box thinking is necessary to establish successful disruptive ventures. Transdisciplinarity and Collaboration & Co-creation are elements that facilitate the development of solid business solutions.

A Risk-taking attitude is necessary to pursue new and disruptive solutions. Sustainability, as a core value, is mandatory in a world that can no longer support social or environmental damage. Internationalization, Global-Local thinking and the desire to Transform the world ensure that high-impact ventures will be pursued. Finally, R&D & Innovation reminds us that research alone is not enough; it needs to be developed to reach the market and be recognized as an innovation, being a meaningful contribution for society.

The second dimension – **Prepare the Environment** – comprises a set of elements to be planned and implemented to allow the harmonious operation of an entrepreneurial university. Top management commitment appears as the first element of this dimension, because it facilitates everything else. Without the endorsement of top management, the entrepreneurial spirit will not be spread throughout the university. Governance and supporting Policies are other central elements, necessary to lead the journey and ensure the spirit of an entrepreneurial

university. Networking provides quick solutions for problems that entrepreneurs will certainly face.

Funding is necessary to cover the expenses of the entrepreneurship ecosystem or solve cash flow problems. Organizational Capacity is an important element to cope with ecosystem management and operation. Qualified Innovation Staff is central for running the entrepreneurship programs and supporting new ventures. Infrastructure, involving co-working spaces, equipment and labs, is necessary to conduct the actions. Qualified Mentoring provides fast development and greater value for business propositions. Communication channels are essential to connect and inform stakeholders.

Engage Stakeholders is the third dimension. This is not an easy task because entrepreneurship ecosystems have many stakeholders. Focusing on the chief stakeholders, the Administration of the University must be engaged, because it enables or facilitates many actions. Students at all levels are also key stakeholders, as they propose and conduct many of the ventures. Researchers afford the raw material for entrepreneurs, in the form of new technologies, new methods, or new algorithms.

Teachers & mentors use their experience to provide knowledge and guidance to potential entrepreneurs. University Staff supports R&D and the entrepreneurship ecosystem activities. Alumni, if engaged, may support new ventures, through funding or mentoring. Industry is an essential stakeholder that can help in many ways, from providing seed money for relevant start-ups to being a partner in the production and distribution of new products. Funding Agencies provide money for training programs, R&D, and incubated companies. Society demands, endorses and benefits from new ventures. Government issues incentive policies and is especially interested in the spreading of new competitive business.

The first three dimensions are essential to prepare the mind, the environment and the stakeholders for action. On the other hand, the fourth dimension – **Conduct the actions** – is where things happen. In this dimension, the

selected 10 essential actions are: Courses, comprising the offering of a comprehensive entrepreneurial training program; Challenges, such as hackathons and the like, encouraging students and researchers to participate; Events, promoting success stories, connecting the actors of the entrepreneurship ecosystem and attracting new participants; International projects, fostering global thinking and scalable solutions in local ventures; U-I Collaboration, which helps in qualifying R&D activities and establish partnerships for making ventures viable; Protection of IP, assuring that all knowledge generated by the entrepreneurial ecosystem will be protected by law and available for new businesses; Technological Transfer and Knowledge Transfer, reinforcing partnerships with public and private organizations and achieving mutual benefits; Start-up Support, provided by incubators and mentors, ensuring a higher rate of success in entrepreneurial initiatives; and Spin-off Support, offering the conditions and incentive for the emergence of companies derived from laboratories and technological parks.

The fifth dimension – **Deliver VAlue for Stakeholders** – brings together the elements that justify the ecosystem's existence. There are 10 selected elements which guide ecosystem activities. The first element, Better professionals, is a value delivered by the ecosystem, because entrepreneurial training develops a series of skills, which contribute to the delivery of better professionals, even if they come to work as company employees and not as entrepreneurs. Entrepreneurial professionals are another relevant value, because through entrepreneurial training, a greater number of entrepreneurs will generate their own New companies, providing More jobs and Technological progress, which are important values for society.

Start-ups launched by these entrepreneurs can offer Better products and services, Solutions to social problems, or Solutions to environmental problems, which are also relevant values delivered by the entrepreneurial ecosystem. In addition, these new companies generate an Increase in

Gross Domestic Product that benefits society as a whole. Finally, among the selected elements, the establishment of Inspiring workplaces, as is typical in entrepreneurship and innovation ecosystems, also stands out as a relevant value. These inspiring workplaces contribute to changing working conditions and people's relationship with work for the better.

The sixth dimension – **Measure Results** – comprises a set of 10 Key Process Indicators (KPIs) selected for tracking the performance and progress towards an enduring entrepreneurial university. The set comprises three process-oriented KPIs and seven result-oriented KPIs. People impacted by courses, challenges and events, the first process-oriented KPI, measures the effort made in training and provides knowledge to potential entrepreneurs. The remaining two process-oriented KPs are Capacity of tech parks or incubators, which measures the potential of the ecosystem concerning the launch of new ventures, and the Current number of incubated companies assesses how deeply this potential is exploited.

Next, the seven **result-oriented KPIs** are presented. Start-ups derived from the university in the last 5 years measures our efficiency in transforming incipient business proposals in real companies. Deposit of patents in the last 5 years evaluates the volume of our R&D activities, while Patents granted in the last 5 years appraises the quality of these activities. Money received in royalties in the last 5 years informs us if our R&D activities are market-oriented and valued by the business partners. Contracts with external companies in the last 5 years measure if our activities are comprehensive, capable of attracting many partners, while Money contracted with external companies in the last 5 years reveals the size and value attributed to the U-I collaboration. Finally, the Impact in local economy, in spite of being difficult to assess, is an essential measure of value for society and usually crucial for sustaining the funding flow.

Figure 3 presents a compact version of MESAVAR, depicting the dimensions, the logic connecting the dimensions, the 50 essential elements and the 10 KPIs.
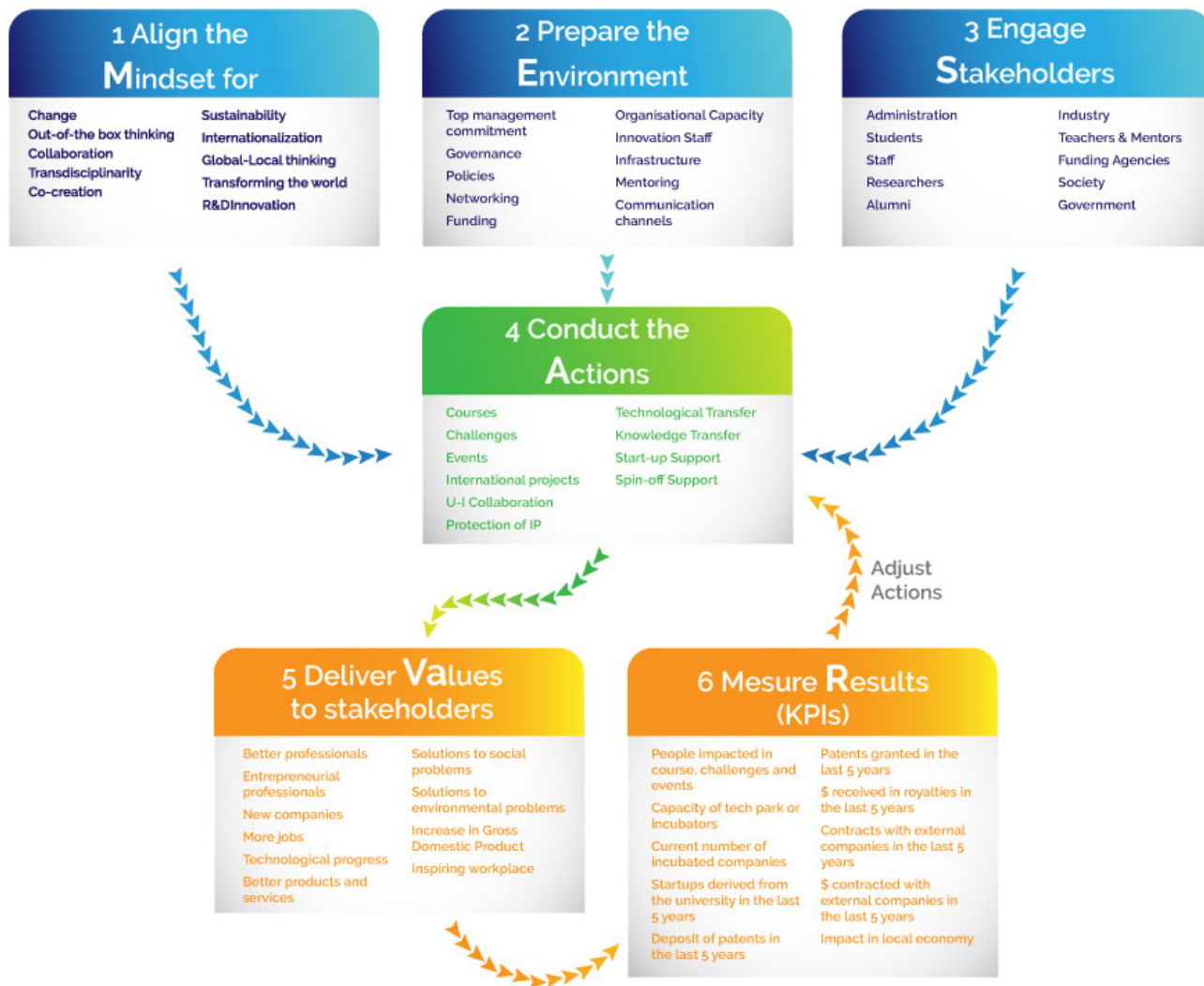
22

Figure 3: LISTO MESAVAR approach for fostering entrepreneurial spirit in universities: the 50 Essential Elements and 10 KPIs for Entrepreneurial Universities, The MESAVAR model was elaborated by professor José Luís Duarte Ribeiro (UFRGS).

RECOMMENDATIONS AND GOOD PRACTICES

After the virtual meetings, the work groups presented 15 recommendations related to the challenges discussed in the previous section. In order to set up a list of best practices for our university communities, we analyzed and consolidated the list of recommendations. The final list is presented in the following pages, with color indications and graphic elements to highlight **for whom** we are addressing the recommendations, **what you can do** to achieve the proposed results, how to **engage external agents** in terms of internationalization and **how you can achieve the results** desired by the recommendations.

Recommendations for whom?

1 University Top Management Engagement: transdisciplinarity as a strategy

> Transdisciplinarity is one of the key characteristics and driving forces to successfully include entrepreneurial and innovative mindsets, attitudes and culture as a strategic objective of the universities. In order to boost transdisciplinarity, universities need to create incentives and policies that encourage transdisciplinary studies through their different knowledge areas. This requires top management engagement on writing the policies, approving it in the academic boards and assuring wide dissemination across all sectors of the university and through teachers, students, and staff.

GOOD PRACTICE

Transdisciplinarity in Institutional Development Programs and Statutes (UNL)

The concept of Transdisciplinarity is incorporated in the Institutional Development Programs and Statutes of the Universidad Nacional del Litoral. The UNL University Assembly (highest university management body) approved the reform of the University Statute in 2012. In turn, the guidelines proposed in the UNL Institutional Development

Plan (2010-2019), contemplate the rules of institutional life for the coming decades related to the quality, legitimacy and relevance of the University. Chapters 2 ("Research and Development") and 3 ("University Extension") deal directly with the impact of transdisciplinarity on academic activities

2 Transdisciplinary disciplines for undergraduate and graduate courses: smart education

In order to boost transdisciplinary entrepreneurial education, universities need to implement classes with a transdisciplinary curriculum – both at the undergraduate and graduate level. This requires a joint effort and collaboration between Innovation and International Affairs Offices, the senior university management, faculty boards and experienced teachers to design and approve updated curricula. These new programs must take into account different ways to promote the internationalization of students, the exchange of international backgrounds in terms of Entrepreneurship and Innovation and the cross-cultural collaboration to promote self-transformation. It also must take into account the imperative to attract students from different knowledge/technological areas.

GOOD PRACTICE

"Projetão": teaching innovation and entrepreneurship (UFPE)

The discipline "Projetão" was offered for the first time in 2002. It was proposed by four professors from UFPE; two from the Computer Center, another from the Psychology Department and the final one from the Design Department. This multidisciplinary background was also found among students enrolled in the discipline. Over the years, teachers and students from other areas have joined this movement. In 2017, the discipline started to be offered in another campus of UFPE and, for the humanities students, was offered as "Projetão - Creative Economy." In 2019, seven different classes of "Projetão" were offered at UFPE. The approach used in Projetão is based on the well-established fundamentals such as the Lean Startup model, the User-Centered Design and the Design Thinking methodology. All this effort contributed to the development of something like an

entrepreneurial style, attitude or culture among students who participated in the discipline. Link: www.projetao.com.br

UVaEmprende (UVa)

UVaEmprende is an extra-curricular sequence of training which the Science Park manages and offers to the regional ecosystem through the four campuses. The itinerary is adapted to the needs of students and researchers and the stage of development of their ideas. From the initial design stage to producing a prototype UVaEmprende provides the tools and methodologies needed to launch a project and advance it. For example, UVaEmprende provides training for Design Thinking, Elevator pitch, Creativity, Model Canvas, User experience, Lean Startup, Social entrepreneurship, Branding, Storytelling, Blockchain, VMP, and Marketing. The program has three levels

Reach your dreams: Are you interested in entrepreneurship? Do you want to turn your passion into your way of life?

Boost your idea: Do you have an idea that can meet a need or problem in society through a product / service?

Evaluate your project and go to market: Are you ready?

3 Engaging Researchers and Professors: from the laboratories and classes to an entrepreneurial immersion

To change faculty mindset and attitudes, to share good practices and tools of entrepreneurial culture, and to recognize the importance of an entrepreneurial approach linked to teaching, extension and research practices, it is proposed that researchers and teachers from different knowledge areas carry out immersion stays in technological centers, business incubators, and/or business complexes from other countries. This will promote their entrepreneurial mindset and allow them to test the possibility of taking advantage of these skills to develop technology-based companies. These actions might deliver interdisciplinary and collaborative training options for teaching strategies to develop entrepreneurial attitudes in students.

GOOD PRACTICE

"Lazos" Program: linking university with the SMEs (UNC)

The Universidad Nacional de Córdoba has different programs to promote Entrepreneurship within the University and support entrepreneurs in the regional environment. Lazos means "ties", "links". The program is designed to solving one specific local problem: the local economy is mainly made up of Small and Medium-sized Enterprises (SME) with numerous survival and growth problems, but graduates do not have the skills to provide specialized and interdisciplinary assistance to these entrepreneurs and enterprises. The program is managed by the Faculty of Economic Sciences of the UNC and the Ministry of Industry, Commerce and Mining of the Government of the Province of Córdoba. The main effort is to put together entrepreneurs from the region, graduates with an entrepreneurial profile from UNC and researchers from different areas such as Economics, Business, Accounting, Psychology, Engineering, Social Communication, Law and Design. UNC already promoted 12 editions, involving 150 startups, 600 graduates and 12 professors.

Mentor4Research (UU)

Mentor4Research gives researchers the opportunity to work with experienced mentors who have many years of experience from working outside of academia. The goal of the program is to facilitate deeper insight into and understanding of the commercialization process, to increase links with the business community and to carry out a preliminary evaluation of the commercial potential of their research. Mentor4Research is intended for researchers and postgraduate students in all research fields - from science and engineering to medicine, the humanities and social sciences. It requires no prior knowledge of commercialization, but the program is especially tailored to those with little or no experience of commercializing research and who want to know more. In addition to the individual meetings with mentors, Mentor4Research includes a number of joint events where researchers get the chance to meet fellow participants and gain in-depth or new knowledge about relevant topics in impact creation processes. The program runs annually by UU Innovation, as part of the support offered to researchers.

4 The Technology Transfer Office Staff: From bureaucratic routines to strategy and beyond

To make a change oriented to a new way of doing things that promotes entrepreneurship by learning from experiences in other countries, it is proposed to develop and launch virtual or face-to-face training programs on good practices and challenges that LISTO member universities can carry out in each of their work areas. This training is especially intended for the work teams of the Technology Transfer Offices to open their minds to new management possibilities, getting to know other ecosystems.

GOOD PRACTICE

International Entrepreneurship Program (USP)

Among the several initiatives to promote entrepreneurship, Universidade de São Paulo has a few that combine entrepreneurship and internationalization. They are described briefly below.

For Faculty: Babson College (Boston University) – Babson Entrepreneurial Leadership & Innovation Program for Educators (ELI). (Within Santander-USP partnership program). Designed for faculty growth in entrepreneurship and leadership.

For Staff: Babson Entrepreneurship & Innovation Symposium for RedEmprendia Fellows. This course aims to improve the Agency's assistance to entrepreneurs.

Fundamentally, the course taught how entrepreneurs should think about their business, especially about purpose and objective, always asking: Why? Who? What? How?

For Startups and Staff: RedEmprendia Landing Program is an internationalization support initiative aimed at companies and entrepreneurship professionals of all members of Redemprendia (universities and their business incubators and technology parks). The program supports international stays of one week, during which a work plan is developed. It usually consists of commercial activities and market promotion (for companies) and exchange of knowledge and good practices (for professionals).

Recommendations for what you can do

5 Transdisciplinary challenges and entrepreneurial competitions: engaging by effort and motivation

In order to boost transdisciplinary culture, universities need to promote challenges and hackathons that encourage cooperation between participants in a variety of professional backgrounds. These activities might be organized by the Innovation Office in cooperation with all interested schools/faculties. They should connect interested undergraduate and graduate students, teachers, and staff to organize, join and contribute in the events. Events must engage citizens to solve real problems as well, through the development of innovative solutions. We also addressed the importance of calling external entrepreneurs and organizations (including companies) for action! Prizes are also something to keep in mind in order to engage the participants.

GOOD PRACTICE

Decentralized innovation: the Ithaca Center (UCU)

At UCU (Universidad Católica del Uruguay) we have a decentralized innovation concept. Ithaka is the center for entrepreneurship and innovation designed to be transversal and interact with all the academic units, but it is not the "owner" of innovation or the sole innovator. Its mission is to promote and boost innovation in all academic units and university departments, so we help design, encourage, and execute different activities for the different units, taking into consideration their special needs. For instance, with the audiovisual center we co-organized a speed dating event to help mingle audiovisual startups composed of student entrepreneurs and traditional businesses that were in need of creative connections. In partnership with human resources, we organized an innovation idea contest for faculty and staff and then implemented the winning idea for the university. With the Student Affairs Office, we organized a hackathon to improve our university cafe in which we also invited entrepreneurs and ended in a transformation of our cafe. We consider this to be a best practice because we don't see ourselves as the owners of innovation but as multipliers.

Entrepreneurship based on real problemas:
the Center of Innovation and Entrepreneurship (ORT)

At the Center for Innovation & Entrepreneurship, CIE, entrepreneurship is encouraged based on real problems. To achieve this, we work with NGOs, companies and other organizations which present their challenges to us. With the support of tutors, we seek to provide a solution. One recent example, in the face of the pandemic, is the HackCovid19UY initiative, where we work with Fundación da Vinci, the IDB (Inter-American Development Bank), ANDE (Agencia Nacional de Desarrollo), the newspaper El País and other partners, aiming at quickly identifying the problems that SMEs and society in general have. An open call was launched to listen to the needs and, in parallel, entrepreneurs who wanted to collaborate in the search for solutions were called. The former were asked to return and describe the problems they have, while the latter were asked to record their data and abilities, with which skills they could contribute. Once this stage was closed, we proceeded to map needs with skills. Teams were formed, who worked with tutors through a Design Thinking process to develop a prototype, a minimum viable solution to be tested. As a result of the process, a jury selected 4 ideas, which today are supported by the CIE to become start-ups. Furthermore, LISTO project partner Universidad de Córdoba (UNC) joined the idea and the initiative was replicated in Argentina, organized by the FIDE Incubator of the School of Economics; and also in Costa Rica through the Agencia Universitaria para la Gestión del Emprendimiento.

6 Transdisciplinary Spaces and Experiences: from co-working to events

To reach this goal, universities need to create co-working spaces designed and built as a joint effort of many faculties, assuring transdisciplinarity in their origin. To do so, the Innovation Office might contact the interested faculties, designing the co-working as teamwork, and approving it in the academic boards. Regarding these new spaces, you can also create public events to approximate Universities to Society, to promote scientific and technological solutions and to join projects to solve problems from startups and corporations.

Thematic events must be proposed to engage all stakeholders in projects to fill technological gaps and priorities. In this sense, it's a match making kind of event in which scientists, entrepreneurs, and organizations can come together to develop cooperation projects addressing social demands, creating innovations and, as a consequence, economic development. Developing and enhancing entrepreneurial culture is the key point here. It is needed to truly create engaged people involved in the entrepreneurial and innovative process and to promote awareness on entrepreneurship among the university community.

GOOD PRACTICE

Awareness and engagement among the university members: the University of Groningen Center of Entrepreneurship (UG)

The University of Groningen Centre of Entrepreneurship (UGCE) has developed a funnel approach, which combines "Awareness and interest", "Engagement" and "Action" steps. The funnel begins with raising Awareness and Interest through multidisciplinary entrepreneurship where the UGCE offers extracurricular courses with 100 students per year from all faculties, summer schools, and open lectures from the local entrepreneurs open to students from all faculties and levels of education. They furthermore actively participate in the career days and fairs for students of different faculties. All of these events are either free or very low (financial/time) cost aiming to attract as broad an audience as possible. Engagement activities include curricular courses adapted per faculty, specialized summer courses, minor programs, with 80 students and a "pressure cooker" event – VentureLab Weekend, with 35 participants per edition. It is very important to have the next step, where all generated interest could be channeled towards the VentureLab Weekend, where those students whose interest runs deeper can spend a weekend developing a business plan and get a taste of pitching to investors. After this weekend, the most motivated entrepreneurial students can then continue to Action and develop their business (idea) in the business accelerator of VentureLab North. In the past four years 180 cases have

passed through the VentureLab North program. Within the funnel "awareness – engagement – action" VentureLab is playing a critical role, as without it the momentum achieved through awareness and engagement would not fully be realized. This systematic "funnel" approach gives any student access, and the possibility to figure out if entrepreneurship is truly their path, with supportive instruments to move to the realization of this path.

7 International programs

It is recommended to design and implement an internationalization program focused on strengthening entrepreneurial development for students, teachers and researchers, so as to strengthen entrepreneurship culture within university, and to bring other cultures, knowledge and practices to our university. To boost internationalization, LISTO members could enlist and share all their programs and partnerships to identify synergies. This requires new forms of collaboration between university leadership, International Relations and Innovation Affair Offices.

GOOD PRACTICE

LISTO IVC Entrepreneurial Solutions in Innovative Global Networks

The International Virtual Classroom was developed by the LISTO consortium. It aims at developing and strengthening students' innovation and entrepreneurial skills within the framework of an international, multicultural and multidisciplinary virtual teaching and learning environment, with a focus on global entrepreneurial ventures and the United Nation's Sustainable Development Goals. The 30-hour course (14 synchronous and 16 asynchronous working hours) includes local/in-person sessions, international video conference and virtual exchange group work outside the face-to-face sessions. The course is run by teachers from each LISTO partner and open to 100 students each year.

Recommendations for how to engage external agents

8 Raising Entrepreneurs with International Engagement: local startups and the born global challenge

Global mindset and deep knowledge in culture and business in prospect countries are fundamental to successfully navigate international markets. To achieve this, it is necessary to educate/ train University entrepreneurs (students, staff, professors), incubated start-ups, and University spinoff companies for business internationalization. This training should include concepts like exports, imports, culture in the target country/ ies, markets, laws, etc. It could be done through specialized consulting and mentoring for particular products/services, through funding/financing for the participation in business events, business rounds and soft landing. This will allow raising awareness of opportunities to go international and provide resources such as the Erasmus for Young Entrepreneurs funds, or developing collaborations such as the LISTO project, to encourage cross cultural collaboration from Secondary schools.

GOOD PRACTICE

Local companies and global markets: the GLOBALTECH Program (UFRGS)

At UFRGS we have the GLOBAL TECH Program. This program was designed to prepare regional tech companies/startups aiming to access global markets to go through a full business internationalization program, starting from Portugal to get to the European market. The Global Tech Program offers (i) Training for companies/startups in topics such as exports, imports, international markets, international funding, etc; (ii) Specialized consulting and mentoring in tech European markets (specially the portuguese market); (iii) Participation in an international mission to the Web Summit, including services such as business networking with local authorities, potential partners and customers, one-to-one meetings and business rounds, and visits to innovation hubs with soft landing capabilities. Our Global Tech Partners are: SEBRAE (Brazilian Service to Support Micro and Small Companies) and local Science and Tech Parks - Zenit/

UFRGS, Tecnopuc, Tecnosinos and Feevale TechPark. Our funding model is: All services are 70%+ subsidized by SEBRAE. Remaining 30% must be covered by company/startup.

Recommendations for how you can achieve desired results

9 Creation of the LISTO International Network: promoting entrepreneurship and innovation globally

To take advantage of the level of commitment and interaction among current and future members, it is recommended to institutionalize the network of professors, researchers and staff created during LISTO Project execution to promote future actions (eg. programs, projects, courses) in our universities. This will allow professors, researchers and staff related with entrepreneurship and innovation disciplines, programs and offices to formalize a network in the institutions by means of institutional registries, by the research groups, laboratories or linked with undergraduate or graduate programs.

10 Building a School Together: the formalization of the transdisciplinary agenda

To achieve these results, universities need to create transdisciplinary schools in order to develop more problem and solution-oriented research and teaching consulting. This must be implemented by involving people from different schools or faculties on a broad topic such as public health, energy, sustainability, etc. To do so, the university should create a multi-faculty based institute on such topics, with a budget at the institutional level, and an entrepreneurship area in each of those schools organized by the Innovation Office or by Entrepreneurship Centers.

Contact Information LISTO Consortium

LISTO Project website: www.listoproject.eu

Instagram: @listoproject

Uppsala University Innovation: www.uuinnovation.uu.se

University of Groningen Centre of Entrepreneurship:
https://www.rug.nl/ugce

Parque Científico Universidad de Valladolid:
http://www.parquecientificouva.es/

Universidade Federal de Pernambuco, DINE - Diretoria de Inovação e Empreendedorismo: https://www.ufpe.br/positiva

Universidade de São Paulo, AUSPIN - Agência de Inovação:
http://www.inovacao.usp.br/

Universidade Federal do Rio Grande do Sul, SEDETEC - Secretaria de Desenvolvimento Tecnológico:
 https://www.ufrgs.br/sedetec/

Universidad Nacional del Litoral, Vinculación y Tranferencia Tecnológica: https://www.unl.edu.ar/vinculacion/

Universidad Nacional de Córdoba, Secretaría de Ciência e Tecnología:
https://www.unc.edu.ar/ciencia-y-tecnolog%C3%ADa

Universidad Catolica del Uruguay, Ithaka Centro de Emprendedurismo e Innovación:
 https://www.ithaka.ucu.edu.uy/

Universidad ORT Uruguay, CIE - Centro de Innovación y Emprendimientos: https://cie.ort.edu.uy/

About the LISTO project:

LISTO (Latin American and European Cooperation on Innovation and Entrepreneurship) was an Erasmus+ capacity building project (Key Action 2) running from 2017 until 2020. The consortium of 3 universities from Europe, 3 from Brazil, 2 from Argentina and 2 from Uruguay brought together experts from innovation offices and entrepreneurship teachers to facilitate an exchange of knowledge and good practice. It focused on three main areas: methods to strengthen university-industry relations; teaching entrepreneurship through virtual exchange; and strategies to promote innovation and entrepreneurship in the university.

For more information, see: **www.listoproject.eu**

The consortium published two e-books and one toolkit available in English, Spanish and Portuguese:

1 University-Industry Cooperation in Latin America. Lessons learned from Applying the AIMday Methodology

2 Entrepreneurial Virtual Classroom Handbook. An Interdisciplinary Approach from a European and Latin American Collaboration

3 LISTO Toolkit for Entrepreneurial Universities

The books are available on the project website as well as on the **Erasmus+ Results Platform**

This toolkit shares the experience of the LISTO consortium addressing the question of how to foster "Entrepreneurial Universities". It gives an introduction into the activities and methods to self-diagnose the entrepreneurial dimension of the partner universities, presents the results in the form of a change-oriented model, and makes 10 specific recommendations for making the LISTO universities more entrepreneurial. In addition, it shares a number of good-practice examples. The main purpose of this toolkit is to inform strategic decision-making processes in the LISTO partner universities to become more entrepreneurial. However, the toolkit is also aimed at a broader audience, including universities interested in developing and implementing similar international collaborations.

LISTO