

RESEARCH AND INNOVATION FOR REGIONAL ECONOMIC DEVELOPMENT AT UNIVERSIDAD CATOLICA SAN PABLO

Erasmus+ I2LATAM: Fortalecimiento de la investigación y la innovación en universidades jóvenes para el desarrollo regional en América Latina.

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Comentarios	

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Executive Summary

The mission of the university is to contribute to the development (transformation) of its environment. This mission, from a historical point of view, is addressed in the training of professionals who contribute to society in various fields of knowledge when they are required. In today's society, where information and knowledge are the keys to transformation, it is recognized that universities are centres for creating, deepening knowledge and adapting it to catalyse this transformation environment directly through research and innovation.

This report summarises the work carried out within the framework of the project: "Strengthening research and innovation in young universities for regional development in Latin America I2LATAM", this work has raised the awareness of university authorities in tune with the need of cooperating with external key players to cause an positive impact in its influence zone. The numerous meetings with companies, civil institutions and public sector held in the framework of this work have emphasised this as a priority. The project also has made clear the virtuous interaction consequence of such interactions.

Although the objective of articulating an ecosystem is a great challenge, we have benefited from the methodology of European peers who have come a long way by working intensely with their local environment. In addition, their experiences have encouraged us to continue with this action in a more structured way, interviewing key regional actors, organising the information in a systematic way that allows an internal analysis of the potential and opportunities for improvement of our institution. Finally, this has led to the design of a series of strategies indicated in this report and that will be implemented in the short term. In particular, we will focus on increasing the faculty (and administrative structure) and providing the conditions that will effectively promote its dedication to research and innovation projects that aim at solving regional issues.

Introduction

About Universidad Católica San Pablo and the Region of Arequipa

Since its foundation, the Universidad Católica San Pablo (UCSP) has recognized as a fundamental value the search for truth, which is the core of research and academic training, thus contributing to the formative process of professionals and to society. In this sense, the UCSP Research Directorate encourages the development and consolidation of research in the faculty. With this aim initiatives and guidelines are issued and applied to academic units that foster research at the university.

In the last 5 years, UCSP has developed 54 research projects with internal funds, while another 29 are financed by external, national and international institutions. These projects cover the different areas of specialisation of the UCSP and seek to contribute specifically to regional development.

The relationship between UCSP and external actors in the Arequipa region has identified our university as a reference actor within the research and innovation (R +I) ecosystem. This is evidenced by our participation in important regional initiatives such as; participation in the steering committee of the regional agenda for innovation, in which the region's priority areas were identified. In addition to this, it is a leading member of the Regional Ecosystem Dynamization (DER) project, an initiative led by the regional government of Arequipa, which seeks to consolidate the innovation ecosystem in the region.

About the I2LATAM Self-Assessment Process

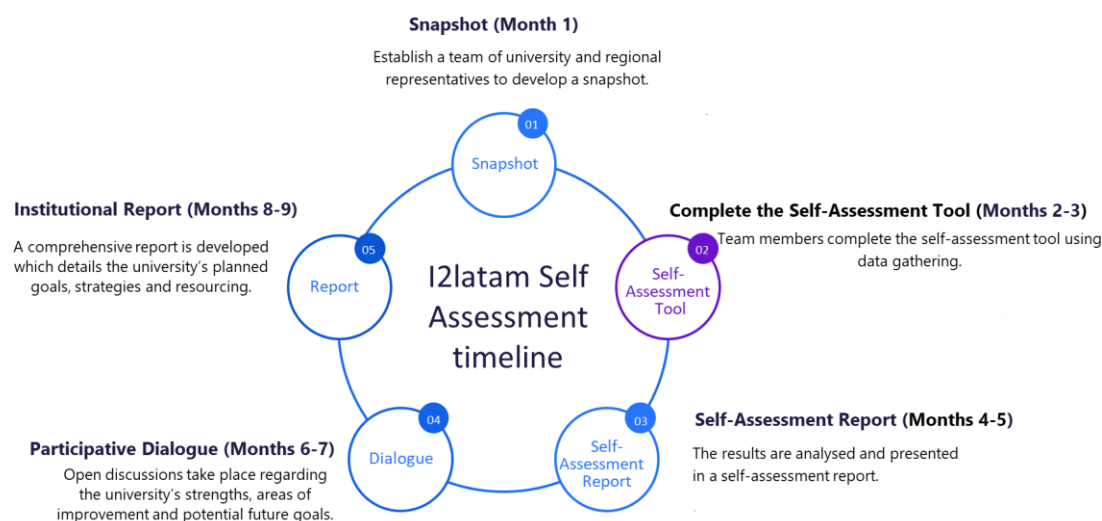
The I2LATAM Self-Assessment Process is a five-stage process that enables university senior management to assess their level of institutional support for, and design future actions to enhance, research and innovation activities relating to economic development within their region. Specifically, it allows universities to:

- Assess their current and aspirational levels of support for research and innovation activities relating to economic development within their region.
- Analyse the impact of the university and regional environment on engagement in research and innovation activity related to regional economic development.
- Identify future actions to enhance research and innovation activity related to regional economic development.

A core feature of this process is the self-assessment tool which allows the university to score themselves across 8 dimensions: Profile of Regional

Innovation System, Leadership, Organizational Capacity, Human Capital Development, Knowledge Exchange, Research Collaboration, Community Engagement and Measuring Impact. Their scoring across these eight dimensions are then analysed to determine their current and aspirational levels of support for research and innovation activity relating to economic development within their region (see the Self-Assessment Report).

The self-assessment tool is applied through a five-stage process as follows:



Piloting Methodology at Universidad Católica San Pablo

The self-assessment process was carried out in two sessions; with the participation of internal and external actors in the University.

To do this, previously, a compilation of relevant information and documentation was made, for each of the indicators to be evaluated (profile of the regional innovation system, leadership, organisational capacity, development of human capital, exchange of knowledge, collaboration in research, community participation and impact measurement).

During the meetings with internal and external participants a summary of the dimensions was made with the indicators obtained in the UCSP, so that all participants can contribute with the evaluation and have a current frame of reference for the elements evaluated.

Below is the list of participants of the UCSP external evaluation committee

- Director of Research at UCSP

- Director of the Centre for Business Liaison (CENDES) of the UCSP
- Head of the Office of Research Projects and Transfer (OPTI) of the UCSP
- Coordinator of the Regional Innovation Board of Arequipa (MIRA)
- Director of the technological scientific park of the Universidad Nacional de San Agustín.
- Researchers in the areas of specialisation identified in the research agenda (WP1).

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Self-Assessment Report

DIMENSION LEVEL OF ANALYSIS

Self-Assessment Report Template – Leadership

Overall Rating	Level of Activity	Level Description	Our Rating
0-20	Limited (1)	University leadership barely, if at all, supports R&I activity relating to regional economic development.	
21-40	Modest (2)		
41-60	Moderate (3)	University leadership supports R&I activity. However, this support may be sporadic, informal, or not fully institutionalised.	
61-80	Good (4)		68
81-100	Very Strong (5)	University leadership fully embraces R&I activity related to regional economic development. Leadership champions R&I activity at the institutional level and ensures sufficient structural support is in place for its development.	

Current Position: Explain the rationale for the item ratings, with reference to the evidence gathered in the snapshot phase.

UCSP shows good leadership on the part of the authorities in all the areas it has, which continuously support the research work

of its university community. This support is expressed by the allocation of resources to develop several initiatives that promote research in all areas (using internal funding for research initiatives) and promoting the applications to research grants funded by external bodies.

As first point, it can be mentioned that UCSP has an Institutional strategic plan, in which research is one of its strategic lines of action. UCSP has a Research Directorate, a transversal area in charge of overseeing, supporting, and promoting the research initiatives of the academic departments. In addition, the university works together with companies of the region for the preparation and execution of research projects (in applied science). Furthermore, noticing the importance and impact of research the university created a Projects and Research Transfer Office (1 boss and 3 persons hired) to ensure the proper development of projects (developing the planned activities) and to maintain direct contact with public funding entities.

University is also an active member for the Regional Innovation board (called in Spanish MIRA). MIRA groups universities, chambers of commerce, and gubernamental bodies are invited often to discuss issues about projects and funding for research lines that are of importance to our region.

UCSP has 3 lines of research authorised by the Country's Science and Technology (CONCYTEC). These lines allow the university to contact companies to develop research and innovation projects that receive funding through tax deduction systems (for the companies) making them attractive. The university has developed 4 research projects during 3 years (funded by companies) for around 0.7 millions of dollars.

Aspirational Position: Reference any specific aspirational activities for this dimension (consult Good Practice Statements).

University aspires to have a consolidated research and innovation agenda. Further, it is intended to update research and innovation policies that are currently in place. University requires to improve its intellectual property policies that can support the transfer of knowledge and technology from our researchers to others. In particular, a policy that promotes the work with companies and fosters the insertion of innovation (establishing better incentives).

Strengthen the relations with the key agents of the R + I ecosystem, thus, it is convenient to have greater participation in the activities carried out by MIRA, and the Development of the Regional Ecosystem (DER) project. The latter project is granted by

Innovate (part of the production ministry) to enhance the collaboration between actors that increase the level of regional value-added chains.

From the Research Projects and Transfer Office (OPTI), it is proposed to actively promote and support the applications for grants of external funding entities. More training for the OPTI team in the landscape of funding research and linking the activities with our faculty. At the same time, the promotion of projects with companies is expected to increase with joint support between OPTI and Center for Business Services (CENDES).

From the Research Directorate, it is proposed to establish links with regional and municipal bodies to enhance cooperation. Recently in Peru a law enables these bodies to spend resources into developing applied science projects that can solve problems of the community.

Self-Assessment Report Template – Organizational Capacity

Overall Rating	Level of Activity	Level Description	Our Rating
0-18	Limited (1)	Organisational capacity barely, if at all, enables R&I activity.	
19-36	Modest (2)		
37-54	Moderate (3)	Organisational capacity enables, to an extent, R&I activity. However, the current level of capacity is insufficient.	46
55-72	Good (4)		
73-90	Very Strong (5)	Organisational capacity fosters R&I activity. Sufficient funding, expertise and incentives are in place to realise the potential of R&I activity between the university and the	

		region.	
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Current Position: Explain the rationale for the item ratings, with reference to the evidence gathered in the snapshot phase.

The University, through the Research Directorate, promotes research by the development of research calls and other activities aimed at the participation of the university community. The area has an annual budget which is allocated to different activities that promote and foster the research such as:

- Internal funding for research and innovation activities. This is made similar to external funding bodies whose aim is twofold: i) develop research projects in underfinanced areas and ii) train our faculty to apply for future funding to other institutions.
- Monetary contribution as compensation for projects won,
- Purchase of equipment and materials for internal projects,
- Subsidies for the presentation of research in academic events as conferences, seminars, workshops and others.

The directorate of research cooperates with each academic department evaluating the profile of each faculty to be hired.

The university has a Service and Social Projection Directorate (SSPD), which makes the contact between companies and university. SSPD is also responsible for entrepreneurship through the business incubator. Thus research within faculty is governed by the research directorate and enterprise contact and services with companies is organised through SSPD. Further, SSPD is located in a different vice-chancellery than the research directorate. Thus, this form of organisation requires an effort to link between both directorates to achieve better results in transfer of knowledge .

Moreover, the Research directorate has a Research Projects and Transfer Office (OPTI), which is in charge of continuously supporting the researchers for the application to grants and external calls. This office (OPTI) supervises the development of the research projects from the University. In this way, it maintains active contact with researchers and financial institutions.

Regarding the dissemination of research and innovation activities, the University participates in several annual events such as, Perú con Ciencia Fair, where it presents the research projects in execution and other activities that are carried out.

Aspirational Position: Reference any specific aspirational activities for this dimension (consult Good Practice Statements).

The UCSP due to the development of I2LATAM understands there is a problem in its structure that separates research (pure & applied) from relationships and activities with industry (service & applied projects). It is now better understood that both activities benefit one from the other. Thus, the university is studying a form for better structuring the university These activities to promote links between them.

To improve the organisational capacity of the University, it is proposed to seek and develop a map of funding opportunities (national and international) related to the different academic faculties and areas of specialisation of the university to achieve and ensure the development of research continuously over time, this role should be assumed by the Research Projects and Transfer Office (OPTI). On the other hand, the university annually aspires to increase the research budget, which serves to foster research contests, dissemination of results, events, etc.

Likewise, It is intended to promote the capacity for articulation with the regional companies by creating a recognition and an economic incentive (in addition to the incentives assigned for the development of projects) for the research teams and articulators that obtain the greatest quantity and number of projects with companies, in around specific areas.

On the other hand, it is desired to improve the policies for the follow-up and development of research plans in each academic unit of the University, in this way, the competencies and specific research results in each discipline of the university should be improved.

Additionally, it is planned to establish policies for the financing of the University's research groups, which consider quantitative and qualitative factors in their evaluation, in this way support will be provided to the personnel who participate in training and development according to the level of maturity and scientific production.

Self-Assessment Report Template – Human Capital Development

Overall Rating	Level of Activity	Level Description	Our Rating
0-16	Limited (1)	Human capital development barely, if at all, drives R&I at the university.	
17-32	Modest (2)		
33-48	Moderate (3)	Human capital development, to an extent, drives R&I. However, the current range of human capital development activities explicitly linked to the region are limited.	
49-64	Good (4)		59
65-80	Very Strong (5)	Human capital development steers R&I. Strong collaboration between the university and the region ensures human capital is sufficient for the development of R&I.	

Current Position: Explain the rationale for the item ratings, with reference to the evidence gathered in the snapshot phase.

The university is improving its attraction and retention policies for researchers and professors that develop projects. Several research centers and units are aware of the importance of having professors with better skills for research. This was not present in the past of our university. UCSP was (until some years ago) an institution centred in education only. Thus, research is still in its growing phase where hiring professors with a research profile is very important. For this reason, we consider that the number of researchers is an important factor that needs to be improved at the University. Given that many researchers have the role of teacher and academic manager (authorities, team leaders) it means that the development of research and projects is relegated in some aspects. On average, professors have 10 academic hours per week devoted to research out of a

total of 40 hours per week of work

The university incorporates courses related to research and innovation in the different professional faculties and is committed to access to university education for students from economically and socially disadvantaged areas, through internal (UCSP) and external scholarships such as Pronabec.

On the other hand, the university, through the Research Directorate, grants incentives, promotion opportunities and rewards to academic staff who actively develop research and innovation activities through: travel subsidies, economic incentives for project development, financing for research groups, recognition and economic incentives for publications and research with companies, among others. In addition, support is provided annually to professors to improve their skills by granting them post-doctoral periods, internships, and obtaining advanced degrees.

Aspirational Position: Reference any specific aspirational activities for this dimension (consult Good Practice Statements).

The University has a developing human capital, however, some points for improvement in this area have been identified.

The need to incorporate full-time professors with a research profile and to increase the number of hours dedicated to this activity among the University's faculty. The University's senior management has approved an ambitious plan to increase the number of full-time professors. According to this plan, 50 new full-time faculty members will be added up to 2026 (the University currently has 125 full-time faculty members).

In addition, greater participation of the research area is required in the development of the curricula of the University's programs. Emphasise coordination meetings between the academic departments and the Directorate of Research, constant coordination with the Undergraduate area to work hand in hand in order to identify ways to align the current course offerings with the needs of the region.

Also, an activity that should be increased is the support for research internships (incoming and outgoing). This initiative will be coordinated with the Directorate of International Relations and Cooperation for proper planning and dissemination.

Self-Assessment Report Template – Knowledge Transfer

Overall Rating	Level of Activity	Level Description	Our Rating
0-20	Limited (1)	Knowledge transfer barely, if at all, stimulates R&I activity.	
21-40	Modest (2)		
41-60	Moderate (3)	Knowledge transfer, to an extent, stimulates R&I activity. However, the current number and range of knowledge transfer activities explicitly linked to the region are limited.	
61-80	Good (4)		72
81-100	Very Strong (5)	Knowledge transfer is a driving force of R&I. An intense stream of knowledge transfer outputs from a wide range of channels between the university and the region spur the development of R&I.	

Current Position: Explain the rationale for the item ratings, with reference to the evidence gathered in the snapshot phase.

The university is committed to the genuine exchange of knowledge with Arequipa's regional industry, the public sector, the charitable sector and society in general, and has signed institutional cooperation agreements, 13 of which are still in force. In addition, it provides opportunities for UCSP staff and students to participate in knowledge exchange activities with regional actors, for which it has more than 18 agreements for international university cooperation (<https://ucsp.edu.pe/internacional/estudiante-ucsp>).

The university has invested in a business incubator KAMAN, which has as a mission to provide knowledge and application of innovative methodologies to entrepreneurs with an emphasis on the southern macro region, to consolidate their business objectives, generating proposals for different solutions to common problems of the population and the company, taking

advantage of the opportunities of the global environment for the benefit of the development of the region and the country.

The UCSP has developed projects with business linkage, from 2014 onwards it has developed 33 projects in cooperation with industrial companies, likewise, it has collaborated within the framework of law 30309 (tax incentive law - research for taxes) with companies in 4 research projects (nearly 0.7 million dollars in investment). Most of these projects were granted to implement new processes (in Perú) but with known technology abroad or to perform measurement studies about raw material for industrial purposes.

Finally, UCSP has specific institutional policies and strategies related to intellectual property and technology transfer to support collaboration between its university and industry partners.

Aspirational Position: Reference any specific aspirational activities for this dimension (consult Good Practice Statements).

The transfer of knowledge needs to be dynamized, which requires a better articulation with the ecosystem. The main transfer activities take place within the framework of competitive funds promoted by the state (Proinnovate, law 30309 - research for taxes). In particular, the University needs to improve the regulations that promote the care of the intellectual property and its transfer to society.

It is necessary to encourage the development of research on industry problems in which small development companies (suppliers) participate. This can support the development of innovative solutions in medium to large companies. To this aim, the university is getting close to companies and stakeholders implementing a monthly meeting with these actors to get acquainted and offer the university capabilities to solve problems in these institutions. The first meeting of the series is planned to be the first of June 2022.

It is required that the Research Projects and Transfer Office (OPTI) will place greater emphasis on networking, events, and facilitating relationships between the university, companies, and regional entities. For this initiative, support will be requested from CENDES (Center for Entrepreneurial Development at the Service and Social Projection Office). Finally, our expectation is to take advantage of our participation and active role in: MIRA (regional innovation board) and the DER project (dynamization of regional ecosystem).

Self-Assessment Report Template – Research Collaboration

Overall Rating	Level of Activity	Level Description	Our Rating
0-18	Limited (1)	Research collaboration barely, if at all, fosters R&I activity.	
19-36	Modest (2)		
37-54	Moderate (3)	Research collaboration, to an extent, fosters R&I activity. However, the current number and range of research collaborative arrangements explicitly linked to the region are limited.	41
55-72	Good (4)		
73-90	Very Strong (5)	Research collaboration is central to R&I. A wide range of recurring research collaborative arrangements between the university and the region strengthen the development of R&I.	

Current Position: Explain the rationale for the item ratings, with reference to the evidence gathered in the snapshot phase.

The university has signed agreements, contracts, and collaborative R&D sponsored projects with academic and non-academic partners in the region, as part of this collaboration it has developed 45 cooperative projects with non-academic partners in the region.

However, the university does not yet have revenues from patents, licences, R&D contracts, and consulting projects more than the funds assigned to the development of the project itself. The university has identified a future source of revenue that might come

from Intellectual property transfer. However, policies need to be updated and approved by the highest authorities in our university.

The university has provided services to 45 non-academic regional partners, in addition, rents 03 laboratories or its equipments for performing laboratory services. In the case of laboratories, the services are performed at:

- Concrete and construction materials testing laboratory.
- Rocks and pavement mechanics laboratory.
- Hydraulics and fluid mechanics laboratory.

In the case of renting equipment, this happen less often:

- Anechoic chamber for RF measurements.
- Evaluation of the strength and compressive resistance.

Due to the presence of a cement company (Yura S.A.) the university is seeking to partner to develop a specialised cement laboratory to give services and interact in a direct way with this company.

UCSP facilitates the participation of external organisations or individuals in consulting, management, validation, and review boards for HEI, institutes, centers, or programs offered through the hiring of trained professionals, in addition to supporting collaborative activities among professors to address regional problems, assigning resources to research groups.

Aspirational Position: Reference any specific aspirational activities for this dimension (consult Good Practice Statements).

Given the specific conditions of the region and in particular, the fact that there are several universities in the region, it is necessary to seek the associativity of the universities for the development of research and innovation projects that address regional problems and that are developed with complementary capabilities.

To this end several bodies are emerging (regional agenda, Innovation network, among others). The one with clear dominance is

MIRA with gathers universities under the chamber of commerce.

As a latent opportunity for improvement are the possibilities of articulation with:

- The MIRA (Regional Innovation Roundtable),
- The DER project (Dynamization of regional ecosystems).
- The KOICA project for the improvement of innovation capabilities and startups.

In addition, the link between the research area and the Business Development Center CENDES should be strengthened to reach a larger base of companies and clients (non-academics who could receive services from the University).

Despite that, the interaction with companies appears vibrant and several resources are assigned to it, it is perceived that the “level” of interaction has to improve. For the moment, most of the interaction with companies is for renting equipment or laboratory services but not to tackle or mitigate problems that the companies have discovered. This type of interaction will require research skills and calls for innovative solutions. The university is seeking forms to get closer to companies to offer potential solution to initiate this “level” of interaction for this, regular face-to-face meetings with managers are arranged with the rectorate and research directorate.

Self-Assessment Report Template – Community Engagement

Overall Rating	Level of Activity	Level Description	Our Rating
0-10	Limited (1)	Community engagement barely, if at all, triggers R&I activity.	
11-20	Modest (2)		
21-30	Moderate (3)	Community engagement, to an extent, triggers R&I activity. However, the level of community engaged R&I that is explicitly linked to the region is limited.	29
31-40	Good (4)		
41-50	Very Strong (5)	Community engagement induces R&I. Community engagement between the university and the region is prevalent and of strategic importance to the development of R&I.	

Current Position: Explain the rationale for the item ratings, with reference to the evidence gathered in the snapshot phase.

The strategic pillars of UCSP are divided into Teaching-Learning, Research and Service, and projection to society, these are considered in a transversal way in relationship to the community and the environment. This point is reflected in the document "Identity of the UCSP" which analyses the culture, values, and organisational principles of the university in seven dimensions; within them, we highlight research and teaching, since from it "outreach projects and initiatives emerge, either in the development of the solidarity dimension of the university, as well as going out to meet the needs of the public and private sector."

Likewise, the University, through the Directorate of Research, promotes the development of research and innovation projects, in

a collaborative manner with academic, governmental, and private institutions. Thus, between 2016 and 2021, 54 research projects have been financed with internal funds (self-financed) while 25 others are externally funded by institutions such as CONCYTEC, and Proinnovate, among others. Finally, 04 projects are financed through the European Union and in execution with a variety of universities in Latin America and Europe.

On the other hand, students and professors of our academic institution have active participation with external institutions, so that, according to reports from offices such as the alumni community, 24 companies in the region constantly require professionals for the development of practices, in the various training specialties that the university develops.

Thus, we have four Research lines authorised to execute projects under Law No. 30309 (Research for Taxes), in addition to providing specialised training and consulting services. These services are channelled through the Business Services Center (CENDES).

As part of its continuous improvement system, CENDES conducts satisfaction surveys for the companies that receive the services described above. This year, the average satisfaction rate was around 90%.

Despite these links and results, there is a lack of channels to promote research that is not directly funded by the government. All the projects developed in our university are in some way financed through gubernamental institutions. This makes the projects attractive for companies but limits the freedom of the initiatives to the boundaries established in the calls. Also, this usually has strict regulations for buying equipment and other expenditure categories. Furthermore, this does not allow to change or adapt projects once they are approved, this might be needed to adapt to finding or to reach better outcomes if in coordination with the beneficiaries.

Hence, the evaluation and follow-up processes for these activities are still in a maturation stage (a maturation in our institution and the regional ecosystem). The information described above justifies the result obtained in the application of the instrument, placing us in the "good" range with 28.6 points obtained.

Aspirational Position: Reference any specific aspirational activities for this dimension (consult Good Practice Statements).

Research results should be better communicated to a broader audience and to a specialised public, such that it promotes interaction with stakeholders. The university has to create better communication channels with stakeholders to send information (research results) and to have feedback about them.

Within community participation, through the Directorate of Service and Projection to Society should be enhanced. The aim is to strengthen the processes of evaluation and follow-up of the objectives of the various activities and programs carried out by the University. This may arise from the incorporation of external actors in the planning and evaluation processes (steering committees, evaluation boards, consulting committees, or others); in such a case, the recipients of the initiatives would have a more protagonist and active participation. Therefore, it is necessary to develop metrics and indicators to evaluate the results of the activities developed with external entities.

Self-Assessment Report Template – Measuring Impact

Overall Rating	Level of Activity	Level Description	Our Rating
0-16	Limited (1)	Measuring the impact of R&I activity barely occurs, if at all.	
17-32	Modest (2)		24
33-48	Moderate (3)	Measuring the impact of R&I activity does occur to some extent. However, certain assessment and evaluation methods are underdeveloped or unconnected to regional impact.	
49-64	Good (4)		
65-80	Very Strong (5)	Measuring the impact of R&I activity is highly developed. Targeted and comprehensive assessment, evaluation and feedback mechanisms and procedures are in place to measure the impact of R&I on the region.	

Current Position: Explain the rationale for the item ratings, with reference to the evidence gathered in the snapshot phase.

The University annually evaluates the results of research activities through the Award for Excellence in Scientific Research, which rewards the authors of articles in scientific media of recognized academic prestige, taking into account their quality, visibility, and impact. In addition, the Awards for Excellence in Undergraduate and Graduate Thesis Research, that reward the work of faculty advisors and students who have supported and approved undergraduate and graduate theses of high academic and scientific quality. These awards are for the faculty and students at UCSP.

On the other hand, through the guidelines indicated in the research policies, the research lines and groups are evaluated and monitored. As a result of these actions, improvements can be established within the activities and initiatives developed.

The university actively participates in projects aimed at increasing regional development. In this regard, important advances have been made, such as participation in the steering committee for the preparation of the Regional Innovation Agenda for the Arequipa region, and being part of the driving group (group that works as steering committee) in the project for the dynamization of innovation ecosystems financed by Pro Innóvate, the executive arm of the Ministry of Production.

The impact of these projects, as well as their results, are, however, still incipient and not well reported. A challenge in the medium term is to establish indicators to determine their influence on regional development. The score obtained by the working group indicates that in this indicator the university is positioned in the "modest" category with 23.7 points.

Aspirational Position: Reference any specific aspirational activities for this dimension (consult Good Practice Statements).

To improve the impact of research at the University, it is proposed to articulate regional economic development, based on the goals or impacts generated as a result of the research and innovation (R + I) agenda. An institutional proposal is being worked on from the recently created pro-rectorate for the creation of a centre (observatory) that publishes social, economic and cultural indicators periodically that serve as a basis for the evaluation of the different regional initiatives (of our university as well as of the local and regional authorities). The university was aware of the need to measure the impact in several indicators. Hence, in 2021 the observatory was proposed and approved by authorities; its formal creation and initial actions are scheduled for June 2022.

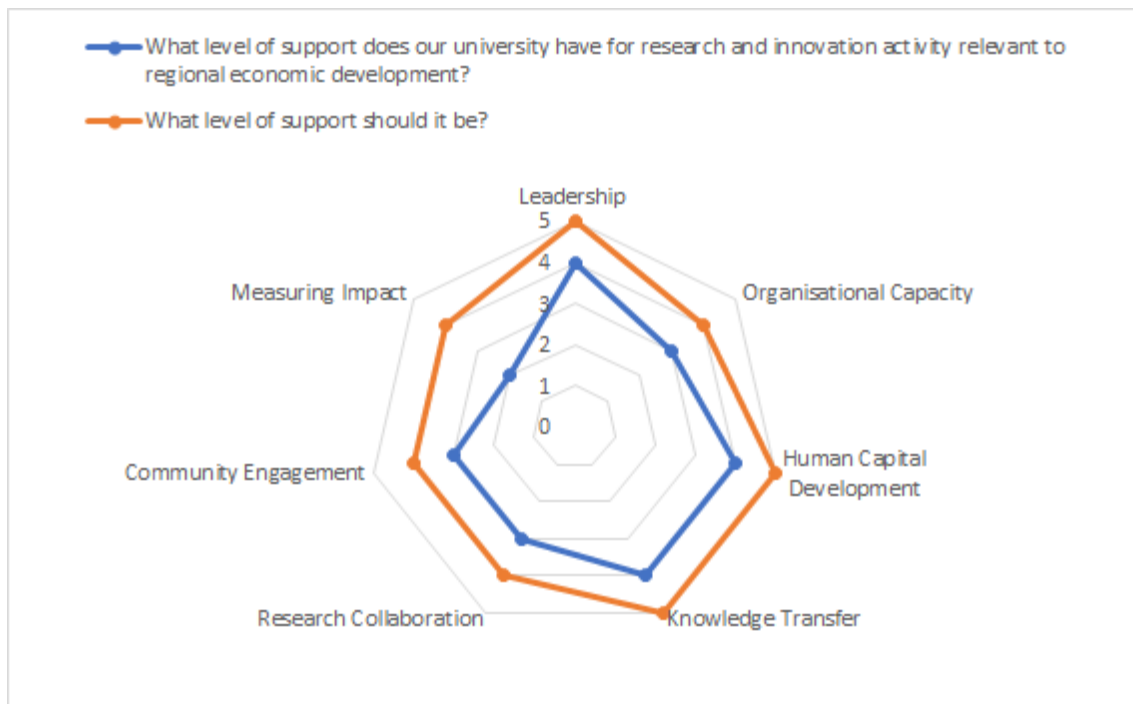
This center should be supported by updated and relevant data that will allow cost-benefit and/or cost-effectiveness evaluations of the proposed initiatives. To this end, we intend to establish a system of internal and external data collection (INEI, MEF, BCR) to help in the evaluation and decision making. The data collection will also include qualitative data obtained from polls to citizens in the region to estimate the satisfaction in several aspects.

TOOL LEVEL OF ANALYSIS

Table of Ratings – Current and Aspirational Levels

	What is the current level of your University's support for research and innovation activity relevant to regional economic development?	What is the current level of your University's support for research and innovation activity relevant to regional economic development?
Leadership	4	5
Organisational Capacity	3	4
Human Capital Development	4	5
Knowledge Transfer	4	5
Research Collaboration	3	4
Community Engagement	3	4
Measuring Impact	2	4

Spider Diagram - Current and Aspirational Levels



Participative Dialogue

About the Participative Dialogue

The participative dialogue is an open discussion (e.g., workshop) among university management, staff, students and the key stakeholders in the region regarding the university's ability to engage in R&I activity related to regional economic development. The purpose is threefold:

1. Determine if the results of the Self-Assessment Report thoroughly, accurately and fairly represent the extent to which the university is engaged in research and innovation activity related to regional economic development.
2. Confirm the SWOT and PEST analysis of university led research and innovation activity related to regional economic development.
3. Identify the future actions that should be taken by the university to enhance research and innovation activity related to regional economic development.

First, the university self-assessment team should present the results of their self-assessment report. Second, the university self-assessment team should receive feedback on the SWOT analysis and PEST analysis (see analyses below) from external members. Third, all members of the participative dialogue should articulate future actions to be taken by the university to enhance research and innovation activity related to regional economic development (see future actions below).

About the Participative Dialogue at Universidad Católica San Pablo

The report of the self-assessment tool was used as the main component for the development of the SWOT and PEST analysis. These were presented in the participative dialogue process with the internal team of the Universidad Católica San Pablo (administrative staff of the knowledge transfer office and faculty related to the research areas) and a set of external persons that are representative of regional stakeholders. Both the internal and external persons involved were specifically invited for this work.

Additionally, to determine the strategies for planning future actions and their linkage to the institutional strategy, a prioritisation exercise was carried out for each of the items. A scale of 1 to 10 was used, with 10 being the maximum value and 1 being the minimum.

In order to align the strategies proposed to the institutional policy of the University, a logical framework was organised according to the objectives of the

Annual Operational Plan (POA) of the Directorate of Research. the main tasks listed in the POA are listed below:

- O1: Develop the research model of our university according to our identity.
- O2: Encourage and consolidate the dynamics of community-academic work.
- O3: Improve productivity and raise the quality of UCSP's academic work.
- O4: Encourage the creation of postgraduate educational programs that contribute to research.
- O5: Update, issue and disseminate the corresponding regulations and policies that allow the proper functioning of all academic units in the area of research.
- O6: To raise the academic quality of formative research work at the undergraduate and graduate levels.

Finally, the items corresponding to the PEST analysis were classified as potential opportunities or threats, depending on their nature. This classification and the scores were obtained from the external articulation team in the participative dialogue session.

The result of this process is shown below:

SWOT Analysis

University

Strengths - *the areas of R&I activity relating to regional economic development that the university does well in.*

1. Positive image in the community and capacity for articulation (convening) with other relevant entities in the region
2. Formulation and application of research projects jointly with regional companies to national financing funds.
3. Good relationship with governmental entities that finance R+D+i (Pro Ciencia, Pro innóvate, among others).
4. Identified areas of internal specialisation in R+D+I.
5. Participation of the University as a key player in regional economic development (KOICA, MIRA, DER).
6. High level of satisfaction with the services provided to companies.
7. Relevant laboratory equipment in some disciplines (Natural Sciences & Electrical Engineering).
8. Development of research projects applied to the region's problems.
9. Growing academic body (increasing number of professors) with specialisation to develop R+D+i.

Prioritisation of strengths based on the participative dialogue

Cod.	Strengths	Score
F5	Participation of the University as a key player in regional economic development (KOICA, MIRA, DER).	8,40
F3	Good relationship with governmental entities that finance R+D+I (Prociencia, Pro-Innovate, among others).	8,20
F6	High level of satisfaction with the services provided to companies.	7,90
F1	Positive image in the community and ability to articulate (convening) with other relevant entities in the region.	7,50
F9	Growing academic body with specialisation to develop R+D+I.	7,50
F8	Development of research projects applied to the region's problems.	7,40
F7	Relevant equipment in some disciplines (Department of Natural Sciences and Department of Electrical Engineering).	7,25
F2	Formulation and application of research projects jointly with regional companies to national financing funds.	6,50
F4	Identified and defined areas of internal specialisation in R+D+I.	6,20

Weaknesses (Potential for Improvement) - *the areas of R&I activity relating to regional economic development that the university could realistically improve.*

1. Need to strengthen some academic areas, some recently created (Health Sciences).
2. Need to improve the organisational structure (Organisational Chart) - Vice Rectorate (hierarchical).
3. Need to increase the number and dedication of professors to R+D+I.
4. Need to increase resources for research (infrastructure, equipment, human and financial).
5. Need to promote the transfer of R+D+i results.
6. Need to measure the impact of R+D+i to the society (create indicators and follow-up processes).

Prioritisation of Weaknesses based on participatory dialogue

Cod.	Weaknesses	Score
D4	Need to increase the number and dedication of professors to R+D+i.	8,58
D5	Need to promote the transfer of R+D+i results.	8,17
D3	Need to increase resources for research (infrastructure, equipment, human and financial).	8,00
D6	Need to measure the impact of R + D + i activities generated by the UCSP at the regional level (create indicators and follow-up processes).	8,00
D2	Need to improve the structure (Organisational Chart) - Vice Rectorate (hierarchical)	7,33
D1	Need to strengthen academic areas, recently created (Health Sciences)	5,67

Opportunities - the internal and external opportunities for the university to develop areas of R&I activity relating to regional economic development.

1. Financial resources are being injected into the R+D+i system (The World Bank loans to Concytec).
2. New international funding sources (EU, others).
3. Growing R+D+i ecosystem (development). Greater articulation with companies and creation of startups.
4. Possibility of developing agricultural extension projects that will require R+D+i (agricultural / water).
5. Decentralisation of R+D+i funds (by the state).

Prioritisation of Opportunities based on the participative dialogue

Cod.	Opportunities	Score
O1	Financial resources were injected into the R+D+i system (WB loans to Concytec).	9,00
O4	Possibility of developing agricultural extension projects that will require R+D+i (agricultural / water).	8,00
O2	New international funding sources (EU, others).	8,75
O5	Decentralisation of R+D+i funds (by the state).	7,50

03	Growing R+D+i ecosystem (development). Greater articulation with companies and creation of startups.	7,50

Threats - *the internal and external threats to the university in developing areas of R&I activity relating to regional economic development.*

1. National political instability (lack of long-term R+D+i public policies).
2. Arequipa's prioritised sectors (Mining, Agroindustry, Textiles, and Tourism) have had negative impacts due to the sanitary crisis (Covid19).
3. Lack of clarity in regional R+D+i policy.
4. Scarce regional funds for financing R+D+i activities (mainly from the government).
5. Regulatory standards and management processes that limit (or lengthen) the process of acquiring specialised equipment for R+D+i.

Prioritisation of Threats based on the participative dialogue

Cod.	Threats	Score
A1	National political instability (lack of long-term R+D+i public policies).	8,75
A2	Arequipa's prioritised sectors (Mining, Agroindustry, Textiles, and Tourism) have had negative impacts due to the sanitary crisis (Covid19).	7,75
A3	Lack of clarity in regional R+D+i policy	7,25
A4	Scarce regional funds for financing R+D+i activities	7,50
A5	Regulatory standards and management processes that limit (or lengthen) the process of acquiring specialised equipment for R+D+i.	7,67

PEST Analysis

Region

N°	Factors	Opportunity / Threat	Score
1	Law 27972 by which municipalities can promote R + D + i projects.	Opportunity	8,0
2	Insufficient regional leadership from the regional authority.	Threat	8,0
3	Lack of regional policies for R + D development.	Threat	7,8
4	Scarce regional funds for financing R + D + i activities.	Threat	7,3
5	Excessive regulation for the transfer of research in certain sectors (for instance health).	Threat	7,0

Economic - regional economic factors (e.g., employment rates, sectoral/business growth) that could affect the university's engagement in areas of R&I activity relating to regional economic dvlpt.

N°	Factors	Opportunity / Threat	Score
1	Arequipa's prioritised sectors have had negative impacts due to the health crisis (Covid19).	Threat	9,0
2	Arequipa is the fourth most competitive region in Peru, according to the Regional Competitiveness Index 2021 (INCORE). Leading pillars such as: infrastructure, education and health. However, the pillar of institutions (regional public institutions is almost the last region at the national level).	Opportunity	9,0
3	The employment rate in the Arequipa region during 2020 was 87.3% mainly in the mining, construction, commerce and other services sectors. Being 94% in 2017.	Opportunity	8,0
4	Arequipa has prioritized productive sectors: mining, agribusiness, camelid textiles and tourism.	Opportunity	8,0
5	Economy with a high informal component, many small and medium enterprises in the region.	Threat	8,0
6	In the context of the southern macro region, Arequipa is the second region that receives more income from canon (mining taxes), over canon and royalties.	Opportunity	8,0

Social - regional social factors (e.g., culture, demographics) that could affect the university's engagement in areas of R&I activity relating to regional economic dvlpt.

N°	Factors	Opportunity / Threat	Score
1	The population growth of the Arequipa region is 1.5 million inhabitants with an intercensal growth of 1.8% (the second highest at the national level). This makes it necessary to develop innovations in public services in order to meet growing demands.	Opportunity	8,0
2	Competitive culture and little articulation that prevents cooperation and associativity to	Threat	8,0

	improve productivity.		
3	In certain geographic areas, a conservative culture persists that prevents the entry of innovations.	Opportunity	8,0
4	The population of Arequipa has a high tendency towards entrepreneurship.	Opportunity	8,0
5	Gradual growth of the regional business sector's confidence in the services provided by the academic sector (universities, researchers, etc.).	Opportunity	8,0

Tech - regional tech factors (e.g., rate of innovation) that could affect the university's engagement in areas of R&I activity relating to regional economic dvlppt.

N°	Factors	Opportunity / Threat	Score
1	The number of researchers in the region is 257 and represents 7% of the national total, with the highest concentration in Lima (2667 researchers representing 62.52%).	Threat	8,50
2	The regional innovation ranking 2021 shows Arequipa among the 5 most competitive regions of Peru. But with a significant deterioration in the institution's dimension (public management).	Opportunity	8,00
3	The national census of research and development (Concytec) determines that R + D + i spending in the Arequipa region in 2016 was 22.7 million representing 4.4% of the total executed at the country level.	Opportunity	7,50
4	Arequipa is the region with the highest number of patent applications (INDECOPI, 2022).	Opportunity	7,00
5	The 3 most important universities in the region, in cooperation with the KOICA agency, develop actions to strengthen entrepreneurship.	Opportunity	7,00

Future Actions

Actions needed to maximise strengths in delivering R&I activity for regional economic development.

Cod	Strengths	Future Actions	Objectives
F5	Participation of the University as a key player in regional economic development (KOICA, MIRA, DER).	Foster the participation of UCSP researchers in projects of regional impact, through a policy of incentives.	O2
		Generate bonds of trust between UCSP and external actors (Government - Business) to crystallise proposals for the development of graduate programs aligned to the regional needs and potentialities of the University.	O4
F3	Good relationship with governmental entities that finance R+D+I (Prociencia, Pro-Innovate, among others).	Specialise personnel in charge of project management.	O1
		Apply for government initiatives for the development of postgraduate educational programs	O4
		Review and update the regulations for project management (internal-external) to ensure their proper execution.	O5
F6	High level of satisfaction with the services provided to companies.	Included in the annual research indicators, the development of projects with companies (law 30309).	O1
		Generate spaces for annual interaction - around specific topics - between companies and researchers, in order to generate initiatives that allow the crystallisation of regional development initiatives.	O2

		Improve the incentives and update policies for the faculty that participate in collaborative projects (business-government).	O5
F1	Positive image in the community and ability to articulate (convening) with other relevant entities in the region.	Develop calls for research projects for UCSP members with the participation of external actors such as associated entities.	O2
		Train faculty and researchers in key activities to maintain and raise the quality of their academic work: scientific writing, academic integrity, etc.	O3 O6
		Conduct a biennial mapping of UCSP capabilities (linked to external needs) to determine potential areas of specialisation, which will allow the identification of strategic areas of knowledge for the development of graduate programs.	O4
F8	Development of research projects applied to the region's problems.	Promote internal calls with regional challenges	O2
		Link the development of theses (undergraduate-postgraduate) with regional challenges.	O3

Actions needed to leverage opportunities for R&I activity for regional economic development.

Cod.	Opportunities	Future Actions	Objectives
O1, O2, O4,O5	External financial resources: World Bank loans to Concytec, international	Strengthen the support work for OPTI - dissemination (Research Directorate -MKT) for external funding calls, considering the areas of specialisation of UCSP	O1

	financing and other sources of financing.	researchers. Seek to link graduates with spin-off companies.	
		Promote spaces for interaction between members of the university community (research groups), in order to develop proposals for research projects. Develop collaborative research initiatives (business - state).	O2
		Design a training program for junior research professors in tools for the development of their research initiatives (scientific writing, research methodology).	O3
		Develop graduate programs linked to regional and financed topics (business-government)	O4
		Review and update the regulations for the management of projects (internal-external) in order to improve their execution.	O5
O4	Possibility of developing agricultural extension projects that will require R+D+i (agricultural / water).	Develop research dynamics in specific thematic areas (agriculture) in order to develop proposals for research projects to close gaps in the identified sector.	O1 O2
		Develop specialisation programs in thematic areas related to the agro-industrial sector.	O4
		Improve incentives for professors who participate in collaborative projects (business-government).	O5
		Guide the development of theses in basic and applied research in thematic areas (agriculture).	O6

Actions needed to work on weaknesses in delivering R&I activity for regional

economic development.

Code	Weaknesses	Future Actions	Objective
D1	Need to increase the number and dedication of professors to R&D&i.	- Hiring accredited researchers with exclusive dedication to research. - Development of agreements and relationships with research groups for the use of resources. - Establish the figure of full-time research professor.	O1
		- Strengthening of research groups. - Through dynamics that allow obtaining resources.	O2
		Hiring of professors with work experience in the business sector (public and private sector).	O3
		- Hiring recognized researchers with experience in the academic lines of the proposed programs. - Generate an incentive program for professors who carry out applied research in graduate programs.	O4
D2	Need to promote the transfer of R&D&i results.	Train technology transfer managers in the best practices, policies and procedures for their tasks.	O1
		Establish a technology transfer policy that allows the design of processes and indicators for its execution.	O5
		Articulate graduate programs tailored to business needs, but with an emphasis on research and innovation.	O4
D3	Need to increase research resources (infrastructure, equipment, human and financial resources).	Articulate the deployment of spaces with institutional needs (infrastructure master plan).	O2
		- Prioritize the acquisition of equipment and resources for research (professors) in the identified disciplines. - Develop agreements and relationships with external research groups that allow the use of external equipment.	O3
D4	Need to	Promote the work of the Prorectorado for	O1

	measure the impact of the R+D+i activities generated by the UCSP at the regional level (create indicators and follow-up processes).	development that evaluates indicators for measuring the impact of R+D+i activities at the regional level.	
		Establish guidelines for the development of an R+D+i observatory at the regional level (articulating with the work of Prorectorado for development).	05
D5	Improve the Structure (Organizational Chart) - Vice Rectorate (hierarchical)	Create a structure that contributes to the various functions of promotion, dissemination, support, evaluation and transfer of research and innovation.	01
		Update the operations and functions manual - MOF in order to optimize the proper functioning of all academic units in the area of research.	05
		Establish a specialized office of academic integrity, which has as one of its main functions the generation of a culture of integrity in the UCSP community.	04

Actions needed to protect against threats to R&I activity for regional economic development.

Code	Weaknesses	Future Actions	Objective
A1	National political instability (lack of long-term public policies in R+D+i).	Participate in concerted dialogue roundtables organized by the government on R+D+I that seek to strengthen public policies.	01
		Link the development of theses (undergraduate-postgraduate) with business needs, making non-state financing possible.	06
A2	The prioritised sectors of Arequipa have had negative impacts due to the sanitary	Participate in dialogue roundtables organized by the regional government to design R + D + i programs that favor the closing of gaps in the prioritized sectors.	01
		Encourage the participation of research groups through internal calls for R + D + i	02

	crisis (Covid19).	projects in thematic areas oriented to the economic development of the region's prioritized sectors.	
		Encourage the development of academic work on topics oriented to the economic development of the region's prioritized sectors.	03
		Promote the creation and periodic updating of a map of business needs and problems.	04
A3	Lack of clarity in the regional R&D&i policy.	Involve UCSP faculty in the dialogue roundtables led by the regional government for the design of public R + D + i policies.	02
		Align the lines of matrix and sectoral research, to the capacities of the UCSP and the R + D + i needs of the region.	05
A4	Scarce regional funds for financing R&D&i activities.	Promote the participation of professors with external entities (companies), in order to channel private R + D + i funds.	02
		Update the project follow-up policy to ensure successful project implementation.	05
A5	Regulatory standards and management processes that limit (or lengthen) the processes of acquisition and transfer of specialised equipment for R&D&i.	Actively participate in the review of the bases of each call for proposals to make comments on them, thus ensuring the execution of the project without any inconvenience.	02