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Fostering Innovation Management and University Business Linkages at Higher Education Institutions

Connection with the environment (society and companies) – Postgraduate studies

Miguel Mendoza[1]

[1] Universidad Peruana Cayetano Heredia (Lima, Peru)

Abstract

The relationship between universities and their surrounding environment—particularly with the productive sector and civil society—has become a central dimension of contemporary higher education. This paper analyzes the importance of strengthening university engagement with society and companies from the perspective of postgraduate education. First, it examines the conceptual framework of university–industry–society interaction and the so-called "third mission" of universities, highlighting its relevance for innovation, knowledge transfer, and sustainable development. Second, it discusses the Peruvian context, identifying institutional and structural challenges that limit effective collaboration between universities and external actors. Third, the paper presents the experience of Universidad Peruana Cayetano Heredia (UPCH), focusing on institutional initiatives aimed at promoting innovation, social responsibility, and collaboration with public and private organizations. Finally, it proposes strategies and indicators to strengthen engagement from graduate programs, emphasizing co-created academic programs, applied research projects, and partnerships with external stakeholders. The study concludes that consolidating institutional structures, fostering collaborative networks, and promoting inclusive and intercultural communication are essential to enhance the social relevance and impact of universities in Peru.

Keywords: university–environment engagement; technology transfer; graduate education; university–industry collaboration; Peru.

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1. INTRODUCTION

The relationship between the university and its environment—particularly with the productive sector and social organizations—constitutes one of the pillars of contemporary higher-education development. Universities have moved from being institutions focused on professional training and scientific knowledge generation to becoming strategic actors for sustainable development, innovation, and social cohesion (Etzkowitz & Leydesdorff, 2000). In this context, university–industry–society interaction is recognized as an essential dynamic in the construction of knowledge ecosystems, where cooperation drives both economic competitiveness and collective well-being.

The so-called third mission of universities refers precisely to this commitment to the environment, complementing teaching and research with activities oriented toward technology transfer, social innovation, and territorial development (Benneworth & Jongbloed, 2010). In the Latin American context, this mission becomes even more relevant given that universities operate in settings where social inequality, economic informality, and institutional constraints demand a more strategic and transformative engagement (Arocena & Sutz, 2016).

From a business perspective, universities serve as sources of talent, applied research, and technological solutions, while for civil society they represent spaces for dialogue and co-creation of knowledge oriented toward the common good. Collaboration can take multiple forms: internships, open innovation projects, university social responsibility programs, or service-learning initiatives (Vallaeys, 2014). These mechanisms help align the relevance of training with labor-market demands and territorial needs, generating synergies that strengthen both educational quality and the university's social impact.

In sum, engagement with the environment should not be understood as a complementary activity, but rather as a structural dimension of modern university management. It involves building sustainable cooperation networks, developing institutional innovation policies, and strengthening participatory governance. In this way, the university reaffirms its role as a key agent of inclusive and sustainable development, capable of articulating academic knowledge with the economic and social dynamics of its immediate and global environment (OECD, 2019).

2. Context of the presentation

2.1. The university–environment relationship in the Peruvian context

In Peru, the relationship between universities and their environment has evolved in recent years in response to regulatory, economic, and social changes demanding a more relevant and articulated higher education system. University Law No. 30220 (2014) establishes that universities must contribute to sustainable development through scientific research, technological innovation, and social responsibility, recognizing the importance of actively engaging with the productive sector and civil society. This orientation seeks to ensure that universities move beyond traditional professional training to become agents of change in their territories (Superintendencia Nacional de Educación Superior Universitaria [SUNEDU], 2025).

However, university engagement in Peru faces several challenges. Weak articulation with the business sector, limited investment in research and development (R&D), and a fragile innovation culture hinder the consolidation of knowledge ecosystems. According to the Organisation for Economic Co-operation and Development (OECD, 2019), Peru's R&D expenditure does not exceed 0.2% of GDP, far below the Latin American average of 0.7%, limiting the ability of universities to generate applicable and transferable knowledge. Furthermore, many institutions lack robust organizational structures to facilitate cooperation with companies, local governments, or social organizations (Consejo Nacional de Ciencia, Tecnología e Innovación [CONCYTEC], 2023).

Programs such as the Special Science Popularization Initiatives and the Technological Innovation Funds (FINCyT) have fostered collaboration networks

between universities and companies. Yet sustaining these networks requires institutionalizing engagement policies within universities. The triple-helix model proposed by Etzkowitz and Leydesdorff (2000)—university, industry, and government as drivers of innovation—provides a valuable framework for strengthening the role of Peruvian universities in productive and social development.

2.2. The need for offices for engagement and technology transfer

Strengthening university–environment relationships requires specific organizational structures to manage, coordinate, and promote cooperation with external actors. Technology Transfer Offices (TTOs) and Engagement or Outreach Directorates fulfill this role, facilitating interaction between academia and the productive or social sectors. Their creation responds to the need for institutional mechanisms that translate research into innovation and academic training into social development (Benneworth & Jongbloed, 2010).

In Latin America, leading universities in innovation—such as the University of São Paulo, the University of Chile, and the Pontifical Catholic University of Chile—have robust structures for technology transfer, business incubation, and intellectual-property management. These offices act as intermediaries that reduce cultural and bureaucratic barriers between academia and industry, ensuring the sustainability of collaborative initiatives (López et al., 2021).

In Peru, universities have begun to advance in this direction. The Universidad Peruana Cayetano Heredia (UPCH), for instance, has a Directorate for Innovation and Technology Transfer that promotes applied research, scientific entrepreneurship, and collaboration with the productive sector. Furthermore, the Pontifical Catholic University of Peru (PUCP) has a Research Management Office with a dedicated Intellectual Property and Technology Transfer unit. These experiences demonstrate that institutionalizing such structures strengthens research management, innovation culture, and external funding opportunities (Vela et al., 2018).

University Social Responsibility (USR) and Outreach Offices play a parallel role in engagement with civil-society organizations and local governments. According to Vallaeys (2014), USR should not be limited to community extension, but rather understood as a comprehensive management strategy aligning teaching, research, and social projection with community needs. Dedicated social engagement offices allow universities to design service-learning programs, participatory research initiatives, and social innovation projects, strengthening institutional relevance and legitimacy.

These offices support alignment with the Sustainable Development Goals (SDGs) and national science and innovation goals. Modern university management must therefore include specialized units capable of coordinating cooperation with industry, civil society, and government, ensuring that knowledge creation has a real societal impact (UNESCO, 2021).

2.3. The importance of academic programs co-designed with key actors

Academic program design is another critical aspect of university engagement. Program relevance depends largely on responsiveness to labor-market demands, social challenges, and emerging technological opportunities. Thus, involving key actors—industry, professional associations, social organizations, local governments, and alumni—is essential to ensure program quality and relevance (OECD, 2019).

Strategic university planning must incorporate participatory diagnostic and consultation mechanisms, enabling consensus on competencies required for future professionals (Bryson, 2018). In Peru, SUNEDU (2022) promotes evidence-based continuous improvement processes, especially in curriculum design and program accreditation.

Collaboration with external actors also supports competency-based education and the creation of joint graduate programs. These approaches align with global trends toward flexible, interdisciplinary, outcome-oriented higher education (CEPAL, 2020). Jointly designed graduate programs in areas such as innovation, environmental management, or digital transformation can enhance employability and social relevance.

Co-creation also fosters applied research and social innovation. Arocena and Sutz (2016) argue that interactive learning between universities and society drives inclusive innovation, particularly in developing scientific systems. Engaging local communities, civil associations, and subnational governments in academic design fosters contextualized knowledge and sustainable solutions.

Methodologically, building relevant academic offerings requires participatory planning and institutional foresight, applying tools such as stakeholder analysis, curriculum co-design workshops, and labor-market trend studies (Godet, 2007). This results in updated graduate profiles, contextualized competencies, and flexible programs integrating practice and applied research.

Ultimately, co-designed academic offerings strengthen university legitimacy, promote inter-institutional trust, and create broader learning communities. Universities do not merely train professionals—they foster knowledge networks that generate shared value across academia, industry, and civil society.

3. AXES OF ANALYSIS

3.1. The experience of Universidad Peruana Cayetano Heredia in its relationship with the environment

UPCH has, in recent years, built an increasingly solid relationship with its environment, particularly with companies, public institutions, and social organizations. Historically recognized for its excellence in biomedical and public health research, the university has diversified its scope toward areas of innovation, entrepreneurship, and social responsibility, aligning itself with international trends in university management based on the triple helix model (Etzkowitz & Leydesdorff, 2000).

The creation of the Directorate of Innovation and Technology Transfer (DITT) and the Directorate of Social Responsibility and Engagement (DRVS) marked a turning point in the institution's strategy. DITT has promoted applied research projects and partnerships with the productive sector, particularly in biotechnology, digital health, and environmental sustainability. It has also supported professors and researchers in participating in international networks and innovation competitions (UPCH, 2023). These actions have enabled research outcomes to transcend the academic sphere and contribute to solving concrete social and economic problems.

Meanwhile, DRVS has strengthened interaction with communities, municipalities, and nongovernmental organizations through service-learning programs, professional volunteering, and social innovation initiatives. During the COVID-19 pandemic, UPCH stood out for its scientific communication efforts and collaborative community-health projects (Ministerio de Educación del Perú, 2021). This institutionalization of social engagement has helped consolidate a more participatory university culture oriented toward social impact.

However, challenges remain in creating transversal articulation between these directorates, the faculties, and the Graduate School—especially in integrating research, teaching, and outreach under a unified strategic approach.

3.2. Strategies and indicators to strengthen engagement from graduate programs

UPCH's Graduate School can play a central role in strengthening engagement with the environment, given that graduate studies represent the space where research and advanced training converge with innovation and knowledge transfer. In this context, the following strategies and indicators are proposed:

a) Institutional strategies

- *Integrate engagement into curricular design*: incorporate courses and innovation or territorial-intervention projects in master's and doctoral programs, in collaboration with external actors (OECD, 2019).
- *Strengthen university–industry–society agreements*: promote internships, applied research, and co-funded theses aimed at solving sector-specific challenges (Vela et al., 2018).
- *Develop joint or co-created graduate programs*: design master's degrees and diplomas with participation from public, private, and civil-society sectors, ensuring relevance and employability.
- *Encourage scientific and social entrepreneurship*: support incubators and networks of specialized mentors who guide graduate students in developing innovation projects.
- *Promote responsible internationalization*: foster academic cooperation with institutions abroad that value technology transfer and sustainable local development (UNESCO, 2021).

b) Monitoring and evaluation indicators

- Number of active agreements with companies and social organizations linked to graduate programs.
- Percentage of master's and doctoral theses with applied impact or participation from external actors.
- Amount of funding secured through joint university-environment projects.
- Number of students and faculty involved in innovation or social entrepreneurship programs.
- Satisfaction levels of external strategic partners (measured through surveys).
- Applied scientific production (patents, technical reports, innovative products) generated through partnerships.

The systematic use of these indicators would allow UPCH to develop an evaluation culture focused on impact, consolidating a university-management system that connects academic knowledge with national needs.

3.3. Limitations in advancing engagement and the linguistic dimension

- Despite institutional progress, UPCH faces structural and cultural limitations that affect its ability to expand external engagement. Key challenges include:
- *Institutional fragmentation*: lack of articulation between faculties and directorates leads to duplicated efforts and hinders the development of large-scale interdisciplinary projects (SUNEDU, 2022).
- *Limited resources for technology transfer*: many initiatives rely on competitive external funding and lack stable institutional financing (Vela et al., 2018).
- *Limited business-sector participation*: a cultural gap persists between academia and industry, characterized by mistrust and insufficient incentives for cooperation (López et al., 2021).
- *Weak culture of social-impact evaluation*: although outreach projects exist, results are not always systematically measured or communicated to society.

A particularly relevant factor in the Peruvian context is the language barrier. Most engagement initiatives operate in Spanish, limiting the effective participation

of Indigenous and rural communities. Incorporating Quechua and other Indigenous languages into communication, training, and research represents both a challenge and an opportunity to strengthen social relevance.

There are institutional examples in this direction. The National University of San Antonio Abad of Cusco (UNSAAC) has implemented bilingual university-extension programs to train Quechua-speaking communities. In addition, the National University of San Cristóbal de Huamanga promotes research and publication of scientific materials in both Quechua and Spanish (Barrionuevo, 2025). UPCH itself has initiated intercultural-health experiences through its Public Health and Nursing faculties, though they are still in the early stages.

Promoting multilingual communication in university management and social outreach not only guarantees inclusion but also enriches scientific production and cultural exchange. In a multilingual country like Peru, linguistic diversification should be considered an element of educational quality and social relevance (UNESCO, 2021).

In summary, UPCH has taken significant steps in strengthening its relationship with the environment through the creation of new directorates and programs focused on innovation and social responsibility. Nonetheless, consolidating a comprehensive engagement policy will require greater institutional articulation, financial sustainability, and intercultural openness to communicate knowledge in the country's diverse languages. Only then can the university fully fulfill its mission as an agent of scientific, economic, and social development.

4. CONCLUSIONS

4.1. UPCH's experience in its relationship with companies and social organizations

In recent years, UPCH has shown significant progress in its engagement with external stakeholders, especially following the creation of new units focused on innovation, entrepreneurship, and social outreach. These initiatives have enabled the consolidation of joint projects with companies and organizations, promoting technological solutions, community health programs, educational initiatives, and projects with territorial impact.

The creation of the Innovation and Entrepreneurship Directorate and the Social Responsibility and Engagement Directorate was a strategic step. As a result, the university not only strengthened its capacity for knowledge transfer, but it also expanded opportunities for faculty and students to engage directly with social and productive actors. In this way, UPCH has been able to respond more effectively to national challenges such as public health, education, biomedical research, and social innovation, reaffirming its role as a scientific institution committed to the country.

This experience demonstrates that when a university organizes itself institutionally to look outward, opportunities for collaboration multiply, value creation becomes more diverse, and sustainable relationships are built on trust and shared objectives.

4.2. Strategies to strengthen engagement at the graduate level

At the graduate level, there is a tremendous opportunity to deepen university–society relationships. Suggested lines of action include:

- Co-created programs with companies and organizations, where external representatives participate in curricular design and serve as guest lecturers.
- Applied research or innovation projects developed in collaboration with organizations that present real-world challenges.
- Professional internships and research stays in public institutions, NGOs, and private companies.
- Seminars, innovation roundtables, and dialogue forums with actors from the productive sector, the social sector, and local communities.
- A network of external mentors to support thesis projects aimed at solving real problems.

To monitor these initiatives, simple and relevant indicators may be considered, such as the number of active partnerships, joint projects, students involved in engagement activities, participating faculty, and satisfaction of external partners.

4.3. Remaining limitations and challenges: a critical perspective

Despite progress, challenges remain. University culture remains largely focused on traditional research, which at times diminishes the emphasis placed on social engagement and collaboration with the productive sector. There are also operational and administrative barriers that hinder agile execution of projects with external actors. Another critical point is the need to strengthen soft skills, leadership, and communication competencies among academic staff and students to improve dialogue with other sectors.

Finally, an underexplored aspect of engagement is the country's linguistic diversity. Most of our communication and outreach strategies are developed in Spanish—and sometimes in English—leaving aside indigenous languages such as Quechua or Aymara. However, institutional examples already point the way: SUNEDU has released informational materials in Quechua, and universities such as UNSAAC and UNMSM have developed bilingual cultural and educational initiatives. Including these languages is not only a cultural gesture but a necessary step for the university to truly engage with a diverse and multicultural country.

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