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Beyond Reciprocity: An Ecology of Couplings in University–Community Engagement at Chilean State Universities

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Research Article

Keywords: University–community engagement, Reciprocity, Organizational semantics, Assemblage theory, Higher education

Posted Date: September 22nd, 2026

DOI: https://doi.org/10.21203/rs.3.rs-11107367/v1

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Additional Declarations: No competing interests reported.

Abstract

University–community engagement increasingly emphasizes reciprocity, yet less is known about how this normative expectation becomes operational within complex university organizations. This article examines how *bidirectionality*—the institutional term used in Chilean higher education to describe reciprocal engagement—is interpreted, translated, and mobilized across policies, management devices, academic practices, and territorial relationships. Drawing on 25 semi-structured interviews with managers and academics from four regional state universities in Chile, the study uses an abductive thematic analysis informed by social systems theory and assemblage theory. The findings show that bidirectionality operates less as a stable property of university–community relationships than as an organizational semantics whose meaning and capacity change across contexts. Its effects depend on recurrent connections among registration systems, funding, academic recognition, teaching and research practices, and sustained territorial relationships. To account for these interdependencies, the article develops the concept of an ecology of couplings, distinguishing three interconnected zones of relational densification: organizational–registral, academic–disciplinary, and territorial–relational. The framework explains why engagement practices may achieve strong territorial continuity while remaining weakly institutionalized, or become highly visible organizationally without developing comparable relational capacity. The article contributes to research on university–community engagement by shifting attention from whether reciprocity is present to the relational configurations through which it acquires, sustains, or loses organizational capacity.

1. Introduction

The relationship between universities and society has become a strategic dimension of contemporary higher education. Under labels such as third mission, university extension, community engagement, public engagement, or Vinculación con el Medio (VcM), institutions are increasingly expected to demonstrate that their activities contribute to social, productive, cultural, and territorial challenges in addition to sustaining teaching and knowledge production. This expectation has encouraged the creation of policies, specialized units, methodologies, registration systems, and evaluation devices (Compagnucci & Spigarelli, 2020). At the same time, it has generated controversies over which relationships count as university engagement, who is entitled to define them, and through which operations they become visible to the organization (Compagnucci & Spigarelli, 2020; Koekkoek et al., 2024; Wahyuni et al., 2024).

In Latin America, this transformation intersects with a long tradition of university extension associated with the democratization of knowledge, popular education, and social commitment (Cano & Flores, 2023). The expansion of third-mission and quality-assurance languages has produced varying combinations of extension, public responsibility, knowledge transfer, innovation, situated teaching, and the evaluation of contributions (Flores, 2024). In Chile, VcM condenses much of this reconfiguration. The 2018 reform reinforced its status as an institutional mission subject to evaluation, while accreditation criteria established expectations concerning systematicity, bidirectionality, internal and external

contribution, monitoring, and continuous improvement (Comisión Nacional de Acreditación, 2023; Ley N.º 21.091, 2018; Ley N.º 21.094, 2018).

Reciprocity occupies a distinctive position in this process. In the international literature, notions such as two-way engagement, reciprocity, and mutual benefit have sought to move beyond linear transfer models toward relationships in which universities and communities exchange knowledge and resources and can influence the course of collaboration (Weerts & Sandmann, 2008; Dostilio et al., 2012).

In Chile, this notion has followed a more explicitly organizational trajectory under the institutional term bidireccionalidad (hereafter, bidirectionality). The concept was already present in discussions of the engagement function before the reform (Von Baer, 2009), but since 2018 legislation, accreditation, and institutional policies have reinforced it to the point that it has become a recurrent criterion for distinguishing VcM from extension, classifying initiatives, and demonstrating contributions. Recent studies show, however, that Chilean universities do not use a homogeneous definition and that their instruments combine different notions of reciprocity, contribution, impact, and transformation (Irarrázaval, 2020; Araya Alarcón, 2024, 2025; Sandoval-Cuevas et al., 2024).

This article takes that trajectory as its point of departure and delimits the problem to the university as an organization. Bidirectionality is not treated as a property that researchers can directly attribute to a relationship between university and territory, but as an institutional semantics available for observing, describing, designing, and evaluating VcM.

This shift matters because the expression 'two directions' may suggest a relationship between two relatively compact units. Yet a university neither observes nor acts as a single subject. Its organizational and academic instances process relations with their environment from differentiated criteria and positions (Luhmann, 2010). Likewise, what the organization calls its 'environment' brings together heterogeneous actors, problems, and relational conditions that exceed the classifications through which the university seeks to render them intelligible. The analytical problem, therefore, is more ambitious than replacing two poles with a larger number of actors. It is to reconstruct the recurrent relations through which certain differences become organizationally relevant and acquire continuity.

The community-engagement literature has shown that reciprocity is not an automatic outcome of exchange and that partnerships articulate different perspectives, expectations, and capacities while also being traversed by power relations (Dostilio et al., 2012; Visser et al., 2026). Research on boundary spanners further shows that the continuity of these relationships often depends on people and units capable of connecting academic, administrative, and community languages, particularly where organizational support is weak (Weerts & Sandmann, 2010; Wahyuni et al., 2024). These contributions move the discussion from the existence of two parties toward the conditions that make a relationship possible, recognizable, and sustainable. The additional step proposed here is to examine how those conditions become linked within the university.

The research question is: How is bidirectionality organizationally configured in Chilean regional state universities, and which recurrent relations explain its uneven stabilization across management devices, academic practices, and territorial relations? This formulation shifts attention from the diversity of definitions to the process through which a normatively installed semantics circulates, is respecified, and acquires different operational capacities. The analysis asks who uses it, what it makes distinguishable in each setting, how it connects with records, resources, and recognition, and where those connections are interrupted.

The argument is that bidirectionality circulates as a recognizable semantic reference but does not retain an identical meaning or capacity. In a policy it may legitimize VcM; in a form it may classify; in a funding call it may select; in a course it may guide methodological adjustments; and in an academic trajectory it may name a form of listening or continuity. These respecifications are not anomalies relative to an ideal definition. They are the means through which the semantics acquires organizational existence. To reconstruct this process, the article proposes the notion of an ecology of couplings, an original analytical category that brings together the organizational selectivity described by Luhmann (2010) with DeLanda's (2021) relations of exteriority, relational capacities, and processes of stabilization.

Ecology refers here to a relational configuration with analytical and porous boundaries, within which recurrent relations of translation and conditioning partially depend on one another, cooperate, compete for resources and recognition, change, or are interrupted.

The remainder of the article is organized into five sections. The theoretical framework first presents bidirectionality as an organizational semantics and then integrates systems theory and assemblage theory into a common analytical device. The methodology specifies the organizational and reconstructive scope of the interviews. The results trace the installation, translation, inscription, and continuity of the semantics and conclude by identifying three zones of relational densification. The discussion develops the analytical yield of the ecology of couplings, and the conclusion summarizes its contribution to the study of VcM and of other semantics entering complex university organizations.

2. Theoretical strategy: semantics, selection, and exteriority

2.1. Bidirectionality as organizational semantics

Bidirectionality became established as a response to relational models in which universities transfer knowledge to communities conceived primarily as recipients (Von Baer, 2009). In the community-engagement literature, reciprocity and mutual benefit have served as principles for moving beyond unilateral service provision and recognizing that participants can intervene in defining problems, methods, and outcomes (Dostilio et al., 2012; Weerts & Sandmann, 2008; Visser et al., 2026). In Chile, the category was incorporated into the distinctive vocabulary of VcM and, with the 2018 reform and new accreditation criteria, acquired the capacity to organize which initiatives are recognizable as part of the

function and which contributions must be demonstrated (Araya Alarcón, 2024; Comisión Nacional de Acreditación, 2023).

Its expansion did not produce a single definition (Araya Alarcón, 2024). Bidirectionality can name diverse forms of participation and reciprocity, processes of learning and recognition, and modifications in the practices through which an initiative is articulated (Dostilio et al., 2012). Nor is it equivalent to co-production, horizontality, or transformation: exchange may occur without joint problem definition, feedback without continuity, individual learning without curricular change, or institutional modification without territorial partners recognizing it as a benefit (Visser et al., 2026). This semantic variation makes it possible to examine how the category is interpreted, translated, and endowed with effects within the organization.

From a systems-constructivist perspective, semantics can be understood as a repertoire of forms of meaning available for uptake in subsequent communications (Luhmann, 2007). Here, bidirectionality is analyzed as a reference that reappears and is respecified in different organizational settings. To say that bidirectionality circulates does not mean that an idea travels intact from one setting to another. It means that a recognizable reference is taken up and respecified whenever it becomes linked to different programs and decisions. Circulation therefore entails transformation.

This clarification makes it possible to distinguish first- and second-order observation (Urquiza et al., 2017). For university actors, bidirectionality functions as a resource for making certain relations intelligible and deciding whether a practice can be presented as VcM. For the analysis, the interest lies in observing these observations: who employs the distinction, what it makes visible, what it excludes, and with which decisions it becomes connected.

Bidirectionality thus constitutes the empirical case of a broader problem: how a normative category acquires operational capacity within a complex organization (Luhmann, 2010). Its stabilization depends not only on the existence of a formal definition but on whether it can be linked to decisions, incentives, devices, and practices that make it usable. The question shifts from 'what does bidirectionality correctly mean?' to 'how does it acquire meaning and capacity in concrete organizational relations?'

2.2. Organizational selection and relations of exteriority

The articulation between Luhmann (2007) and DeLanda (2021) is built around a shared problem. Although their ontologies and vocabularies differ, both theories seek to explain relations among elements that condition one another without being reducible to one another. Systems theory specifies the organizational side of this problem. For Luhmann (2007, 2010), organizations reproduce themselves through communications of decisions that connect with other decisions. An accreditation requirement, a demand attributed to the territory, or a professional expectation does not enter the organization as a direct instruction; it is selected and transformed into a difference compatible with organizational structures and premises.

This operation explains why 'the environment' cannot be taken for granted. In Luhmannian terms (Luhmann, 1998), system and environment constitute a difference. What counts as a relevant environment is constructed through the system's own operations of observation. A university may select certain regional needs, particular stakeholder groups, or specific outcomes as relevant, while other differences remain disconnected from its decisions. Operational constructivism does not claim that what lies outside the university is fictional. Rather, its relevance to the organization depends on the distinctions through which the organization can observe it and connect it with its own operations (Luhmann, 2007).

Assemblage theory adds a second dimension. DeLanda (2021) argues that the components of an assemblage maintain relations of exteriority: they can participate in different compositions and retain capacities that are not exhausted by any particular relation. A course, for example, may simultaneously function as a site of learning, a curricular requirement, support for a territorial initiative, and evidence in an accreditation process.

This is the bridge between the two approaches. Luhmann (2010) makes it possible to observe how a difference acquires intelligibility and connective capacity within the organization; DeLanda (2021) makes it possible to maintain that organizational selection does not exhaust the capacities or relations of what has been selected. The organization produces a relevant environment, but the components with which it relates retain exteriorities that may introduce new differences, resist codification, or sustain connections through other pathways. The first perspective explains the selectivity of inscription; the second, relative autonomy and the variability of relational capacities.

This articulation avoids two reductions. An exclusively organizational reading could precisely describe decisions while overlooking the fact that their continuity depends on relations and capacities that the organization does not fully control. An exclusively compositional reading could enumerate heterogeneities without explaining why some become policies, indicators, or criteria of recognition while others remain peripheral. The conceptual device adopted here therefore follows the movement between organizational selection and relational exteriority.

The concepts of territorialization and coding further specify this movement from assemblage theory (DeLanda, 2021). Territorialization means increasing the consistency of a composition through the stabilization of relations, temporalities, and forms of coordination; deterritorialization refers to processes that weaken or reconfigure that consistency. Coding fixes categories and criteria of membership. In VcM, organizational devices can stabilize certain relations by making them recognizable, but they also anticipate which forms of action are processable by the organization (Dahler-Larsen, 2014; Verdejo-Cariaga, 2024). At this point, coding connects directly with organizational decision-making. Categories therefore do not merely describe practices after the fact; they can operate as premises orienting their design (Dahler-Larsen, 2014).

The temporal dimension is especially relevant (Luhmann, 2010; Dahler-Larsen, 2014). A registration system operates retrospectively when it transforms a completed activity into comparable information,

but it can also operate prospectively when academics and teams know in advance which variables they will have to report. Future inscription reorganizes present decisions. Selection, coding, and territorialization therefore do not form linear stages; they are recursively linked. Practices produce information, information feeds decisions, and those decisions modify the conditions under which subsequent practices are designed.

2.3. Ecology of couplings: an original analytical category

On this basis, the notion of an ecology of couplings is proposed. The term 'coupling' is not used as a synonym for Luhmannian structural coupling (Luhmann, 2007). Strictly speaking, the latter refers to relations between autopoietic systems and should remain within that conceptual framework. Here, coupling is constructed as a second-order analytical category naming recurrent relations in which an organizational selection and components retaining exteriority come to condition and translate one another without merging. Occasional connection or mere co-presence is insufficient. Coupling entails enough recurrence for a relation to modify the possibilities of continuity, inscription, or action of the elements involved.

The notion retains three systemic intuitions (Luhmann, 1998, 2010)—autonomy, selectivity, and recurrent conditioning—and combines them with the relations of exteriority and relational capacities of assemblage theory (DeLanda, 2021). Thus, a sustained relationship between a course and a territorial organization may come to condition teaching plans and the partner's expectations; a registration system may condition which activities are designed while itself being modified by the categories and problems the organization needs to process.

'Ecology' names the configuration formed by these couplings and by the relations among them. The term is intended to capture something different from a network understood solely as a pattern of connections (Abbott, 2005). An ecological perspective also asks how different relations encounter unequal conditions of persistence and how they partially depend on one another. Sociology has used ecological vocabulary to study sets of actors, locations, and relations with boundaries of their own that remain linked to other ecologies (Abbott, 2005). Here the term is used more narrowly to observe interdependencies, cooperation, competition for resources and recognition, reciprocal modifications, and interruptions among relations participating in VcM.

The boundary of the ecology studied here is analytical and organizational. It includes those relations that, reconstructed from university actors' observations, recurrently intervene in the organizational configuration, inscription, and stabilization of VcM. This boundary is porous because these relations connect with organizations and problems extending beyond the university; however, the study does not seek to reconstruct those external ecologies from their own standpoint. The 'outside' appears insofar as it introduces differences that the organization selects and processes, while assemblage theory reminds us that these differences arise from components whose capacities are not exhausted by university selection.

3. Methodology

The article is based on a qualitative study with an organizational scope, aimed at partially reconstructing how university actors make sense of, translate, and mobilize bidirectionality in Chilean regional state universities. The qualifier 'partially' is important: interviews provide access to observations, attributions, and reconstructions of relations, but they do not substitute for direct observation of platforms, meetings, projects, or territorial interactions. The purpose is to identify recurrent relational mechanisms through participants' descriptions of decisions, devices, practices, and conditions of continuity.

The corpus consists of twenty-five semi-structured interviews conducted during 2026 fieldwork at four regional state universities. Most were conducted by videoconference and lasted approximately 60 minutes. Institutions were selected according to territorial heterogeneity, organizational trajectory, and regional location. The corpus was not designed to achieve numerical balance across universities but to provide sufficient variation to identify recurrences and contrasts in observations of VcM.

The sample included five participants with managerial responsibilities in VcM units and twenty academics with experience in projects, situated teaching, community work, applied research, or engagement with external actors. Purposive sampling prioritized participants able to describe institutional orientations and concrete implementation experiences. The distinction between managers and academics was used to characterize positions of observation, not to assume internal homogeneity. Differences and contradictions within both groups were explicitly sought during analysis. The study received institutional ethical approval, and participants took part after providing informed consent.

The interviews addressed conceptions of VcM and bidirectionality, relationships with policies and accreditation criteria, registration mechanisms, articulation with teaching and research, academic recognition, resources, continuity, experiences with external actors, and forms of adaptation to institutional requirements. Interviews were transcribed and anonymized. The codes DIR and ACAD are used to protect confidentiality and distinguish managerial from academic positions. Quotations were lightly edited to remove oral repetition and fillers without altering meaning.

The procedure approximated an abductive thematic analysis (Braun & Clarke, 2021; Tavory & Timmermans, 2014; Urquiza et al., 2017). Thematic analysis provided a flexible strategy for constructing patterns of meaning; abduction enabled categories to be reformulated through iterative movement between empirical material and theory; and a systems-constructivist orientation guided the search for observers, distinctions, and operations of selection. Assemblage theory, in turn, directed attention toward relations persisting beyond a particular inscription and toward the capacities that components acquired in different compositions. Coding and corpus organization were supported by Atlas.ti, following criteria of traceability among excerpts, codes, and analytical memos (Saldaña, 2021).

In a first phase, excerpts concerning bidirectionality, reciprocity, co-construction, feedback, territory, registration, evaluation, teaching, research, academic workload, resources, continuity, and accreditation were coded. The second phase examined who used these categories, from which position, and to

address which problem. Comparison identified differences among central units, disciplines, and trajectories without treating them as homogeneous blocks. A third phase followed episodes in which a practice changed inscription: activities recognized as teaching but not as VcM, relations present in academic trajectories but absent from registration systems, institutional requirements respecified within a course, and territorial problems transformed into research questions or pedagogical decisions.

The fourth phase focused on recurrent relations of translation and conditioning. Rather than calling every connection a 'coupling,' the analysis looked for recurrence and the capacity to affect subsequent possibilities: continuity of a relationship, access to resources, academic recognition, modification of a course, inscription in a record, or selection of a partner. These recurrences gave rise to three analytical concentrations presented at the end of the results as zones of relational densification. Densification does not refer to a formal network measure; it denotes the reiteration and chaining of relations around particular modes of operation.

The scope of inference is delimited by the corpus. The findings reconstruct university observations of territorial relations but do not allow the same interpretations of reciprocity, contribution, or transformation to be attributed to external organizations and communities. This delimitation does not invalidate the organizational analysis; it specifies its object. Future studies combining ethnography, project follow-up, analysis of platforms in use, and interviews with partners could reconstruct how these relations are observed and modified from other sides of the couplings.

4. Results

4.1. Installing a semantics: a shared category with different uses

Bidirectionality appears in the interviews as a category already established in the vocabulary of VcM, although its operational capacity varies according to who uses it and the decision to which it is connected. In some accounts it functions as a criterion for ordering and recognizing activities; in others, as a requirement to be translated into pedagogical practices or as a language for questioning how a relationship is constructed. The difference does not map neatly onto managers and academics. Within both groups there are more normative, pragmatic, critical, and flexible uses.

One manager describes how numerous activities involving firms, students, and external actors already contained forms of collaboration but were not institutionally recognized as VcM:

"When we have applied research and a company is involved, we do not register it. When we have teaching with engagement, we do not register that either. We know that a great deal of bidirectional activity exists; what happens is that we probably did not understand that this was part of engagement, and we had not realized that it was happening on such a large scale." (DIR-01)

The account shows an operation of reinscription. By retrospectively naming certain practices as bidirectional, the organization does not simply discover an essence that had been hidden; it produces a new plane of observation capable of bringing under VcM activities previously distributed across teaching, applied research, or innovation. Here the semantics acquires classificatory capacity and expands the information that can be connected to reports, planning, and accreditation.

This capacity does not require bidirectionality to become an absolute boundary. Another manager explains that the institution chose to recognize, within a broader model, activities that did not meet a rigid definition:

"The university has a presence in the territories. That presence may be a talk or a workshop at a school, and it did not fit such an inflexible equation of bidirectionality. It was decided that the model should be comprehensive: there were unidirectional, bidirectional, and even multidirectional elements. That makes it more complex, but that is reality." (DIR-02)

In this case, bidirectionality retains value as a normative reference but is incorporated into a classification that recognizes other directionalities. The decision does not eliminate the category; it changes the boundary of what the university can inscribe as VcM. The same language can therefore restrict or expand the domain of the function depending on the organizational program to which it is connected.

Variation also appears among academics. One interviewee questions the apparent neutrality of certain methodologies institutionally associated with bidirectionality:

"Bidirectionality and service-learning structure certain ways of working, which can be interesting, but I feel there is considerable sanitization of how the work is done, as if there were no political standpoint from which one approaches it. There always is." (ACAD-01)

Here the semantics is used to interrogate who defines the problem, from which position, and with what effects. Another academic emphasizes a different criterion: the possibility that the design remain open to modifications introduced during the relationship:

"You are supposed to arrive with a bidirectional project, but often the project is designed first and then someone who might be interested is sought out. That is where bidirectionality is lost. Working with communities is unpredictable; you need a framework that allows adjustment and change. For me, it means being open to a dialogical relationship and building something together." (ACAD-03)

It is important to stress that these accounts do not form two opposing blocks. A central unit may need demonstrability without rejecting openness, and an academic may value indicators when they help improve an initiative. What changes is the function the semantics performs in each situation. Bidirectionality stabilizes as a common reference precisely because it permits local respecifications. Its organizational circulation depends less on consensus around an exhaustive definition than on the possibility of connecting it with different problems.

4.2. Translating differences: who observes, and where practice changes

The same experience can acquire different inscriptions within the university. It may exist as teaching in a course plan, applied research in a project, professional collaboration for a partner, and VcM in a report. This multiplicity does not amount to several representations of an identical practice. Each inscription selects different aspects and enables different subsequent connections. The question 'who observes?' makes it possible to identify which difference becomes relevant in each operation.

An academic in the health field locates bidirectionality in the way experiences and forms of knowledge attributed to the environment come to affect professional education:

"The most concrete expression of bidirectionality should be how the needs and knowledge of the environment are incorporated into professional education. Programs are created by us as specialists and do not necessarily reflect what the community needs or forms of popular knowledge. In practical training I can orient this through academic freedom, but it remains informal." (ACAD-02)

The relevant passage does not occur between a territory that 'delivers' information and a university that 'receives' it. The academic selects differences she attributes to territorial experience, interprets them through disciplinary criteria, and converts them into pedagogical decisions within the latitude afforded by academic freedom. The change may be substantial for a course while remaining without formal curricular inscription. The capacity to alter a practice does not automatically entail the capacity to alter broader organizational premises.

The same mechanism appears in experiences with rural schools. One interviewee describes how an initial question changes as the relationship incorporates problems not contained in the original design:

"A more robust engagement question does not arise from the university alone. It may start here, but it is adjusted, corrected, and challenged by what the territory says. At first we were thinking about field trips; later, through conversations with schools, issues emerged around educational continuity, migration, connectivity, and the tension between the national curriculum and local relevance." (ACAD-06)

The relationship reconfigures the initial problem through differences emerging in the connection with educational communities. Academic categories orient the interpretation and processing of these differences, whose incorporation modifies the question and the criteria of relevance. In Luhmannian terms, this movement can be understood as an operation of selection and respecification; from DeLanda's perspective, as the actualization of relational capacities taking shape within the composition.

The same principle helps organize the distinction between discipline and profession. In health, education, engineering, or the social sciences, interviewees mobilize both disciplinary languages and criteria linked to professional practice. These planes are not equivalent. The discipline contributes ways of constructing problems and validating knowledge; the profession contributes criteria of intervention

and experiences derived from professional practice. Bidirectionality can be respecified in both and acquire different capacities to modify a course, a practice, or a research project.

The mobility of inscriptions has an additional consequence. There is no single subject that 'learns.' Modifications may be located in actors, practices, or organizational structures without necessarily extending across these domains. Analysis therefore requires specifying which communication or practice changes, who recognizes that change, and which relations allow it to acquire continuity. This precision avoids attributing to 'the university' a form of learning that can only be reconstructed in part of its operations.

4.3. Registration as a plane of observation and a temporal device

Registration systems occupy a central position because they establish a plane of observation considered sufficient for comparing heterogeneous practices and producing organizational information. The platform is not an autonomous observer, but it incorporates categories decided by the organization and conditions which aspects of an initiative can be inscribed. Registration therefore does more than store information: it connects practices with reports, accreditation criteria, monitoring, and potentially resource allocation.

One manager describes the purpose of one such system:

"From the first attempt to change the model—to move away from an extension-oriented view toward what is now defined—a registration system was implemented, where engagement activities have to be uploaded. Academics have to do this and define practically all the variables involved in each engagement activity, so that when peer reviewers come and ask us how many activities involve, say, interculturality or other areas, all those variables are recorded and we can quickly generate reports." (DIR-03)

The operation transforms different activities into comparable information through common variables. This equivalence creates organizational memory and makes it possible to observe distributions that previously remained dispersed. It can also recognize as VcM activities that already existed under other classifications. Through this route, coding makes visible and organizationally connectable practices that would otherwise remain outside institutional reports and decisions.

The most significant effect is temporal. Registration operates ex post when it translates an implemented initiative into institutional categories, but it also acts prospectively when those categories are known during formulation. One academic describes this directly:

"You are supposed to arrive with a bidirectional project. You commit yourself to activities and indicators all the way to the end, even though working with communities is unpredictable. If participation drops or the situation changes, there is not always a framework for modification. So the professor arrives with a template and looks for someone who might be interested." (ACAD-03)

The future requirement of inscription reorganizes present decisions. Objectives, indicators, and types of contribution anticipate which relations will be defensible before the organization. In turn, difficulties observed during implementation can generate later adjustments to forms or criteria. The temporality of VcM becomes recursive. Categories are used to read what has already been done and to preformat what has not yet occurred. This temporal dimension explains why registration participates in practice even before the form is actually completed.

Yet registered information only expands the capacity of a practice when it becomes connected to decisions about time, resources, and academic recognition. One academic describes the distance between the institutional visibility of VcM and the conditions that actually make it sustainable:

"Institutionally, it is said to be very important; it appears in speeches, plans, documents, and accreditation processes. But when you look at academic workload, incentives, evaluation criteria, the allocation of hours, or the availability of resources, engagement still competes at a disadvantage with other functions." (ACAD-12)

The account shows that the practice–registration relation may increase institutional visibility without by itself ensuring continuity. When inscription becomes linked to decisions about time, resources, or recognition, it can expand a practice's capacity to persist; when these connections are weak, its effects remain concentrated on demonstrability. The capacity of this coupling therefore depends on other couplings with which it does or does not become linked.

4.4. Continuity, dependence, and decoupling

Continuity makes this dependence among relations more visible. VcM initiatives unfold according to heterogeneous temporalities: academic planning, funding, administrative procedures, and territorial relationships do not necessarily coincide. Decoupling appears when a relation retains capacity on one of these planes but the conditions that should sustain it from another are interrupted or arrive at incompatible times.

One academic describes the incompatibility between administrative deadlines and the actual duration of an initiative:

"There was also an issue with spending the funds, which I understand is not the directorate's decision but comes from ministerial requirements about when the money can be spent. So the timelines do not really speak to each other. For example, you are awarded a project and only begin implementation in June, but then you have to spend the money by August even though the project ends in December." (ACAD-10)

Funding enables the relationship by providing resources, but its temporal rules may constrain another relation whose continuity requires a different timeframe. Teams respond through operational adjustments, complementary resources, or previously consolidated commitments. Such responses may sustain the relationship while shifting part of its stability toward less formalized personal or professional

capacities. In this case, the project–funding relation modifies the possibilities of the initiative–territory relation.

Decoupling names the point at which the articulation among these relations weakens without the relationship necessarily disappearing. A collaboration may continue territorially while losing organizational inscription, and an activity may retain high institutional visibility even after the relationship that originated it has been interrupted. The exteriority of components allows these divergent trajectories, while organizational selectivity explains why only some become premises for subsequent decisions.

4.5. Densifications and interdependencies among couplings

Comparative analysis identified three zones of relational densification, understood as recurrent concentrations of couplings around particular modes of operation. The distinction is analytically useful because it shows how relations situated in one zone condition the possibilities of relations situated in another.

The organizational–registral zone concentrates orientation, funding, registration, and evaluation devices through which initiatives acquire a form processable by the organization. Here bidirectionality is commonly respecified as a criterion of inscription, demonstrability, and validation. One director summarizes this articulation in relation to competitive funding:

"We are now reinforcing that projects should have bidirectional characteristics, be registered in the system, and measure their contribution in order to produce a final report." (DIR-03)

The academic–disciplinary zone brings together relations in which territorial experiences are selected, interpreted, and transformed into pedagogical or research decisions. Their capacity lies not simply in interaction with external actors, but in whether that interaction can modify instruments, content, questions, or academic practices. One academic recounts how participation by territorial actors altered an instrument developed by students:

"The students developed an instrument to conduct a diagnosis and, when they compared it with the residents, they realized it was very far from what the residents themselves would have asked. So they realigned the instrument." (ACAD-03)

The territorial–relational zone concentrates conditions of recurrence, trust, and continuity that university participants attribute to relationships with organizations and communities. Its observation remains delimited by the corpus, but it allows us to identify that the persistence of a relationship does not depend solely on its formal design. One academic expresses this through the importance of repeated presence:

"Trust is built when you come back. Not when you send the first email or make the first visit, but when the community sees that you do not disappear after the first activity." (ACAD-06)

Taken separately, these zones describe different concentrations. The ecology becomes visible when their interdependencies are followed. A sustained territorial relationship may introduce a difference that modifies a course; that modification may or may not become inscribed in a registration system; and that inscription may or may not subsequently connect with resources, academic workload, or recognition. The effect of the first relation changes according to the connections it manages to establish with those that follow.

The movement may also begin in organizational devices, whose resources, categories, and temporalities modify the conditions of academic and territorial relations. In these cases, one relation alters the possibilities under which another can be sustained.

These sequences specify the analytical yield of the ecology of couplings. A coupling identifies a recurrent relation capable of modifying the possibilities of the elements involved. The ecological dimension appears when the capacities and continuity of that coupling partially depend on the presence, modification, or interruption of other couplings. The unit of interest ceases to be an isolated relation and becomes the contingent pattern of dependencies that explains why the same practice can achieve high capacity on one plane while remaining weakly stabilized on another.

Bidirectionality circulates among these zones as registral evidence, a criterion for academic adjustment, or an expectation of territorial continuity. Its capacity varies according to the connections it establishes with devices, practices, and relationships.

5. Discussion

Bidirectionality has become established in the VcM and community-engagement literature as a way of distinguishing reciprocal relations from those centered primarily on transfer or unilateral service provision. This discussion has shown that reciprocity can hardly be reduced to the presence of two participants or to the identification of declared benefits. Dostilio et al. (2012) distinguish forms associated with exchange, influence, and generativity, while Janke (2013) warns that the presence of community actors is different from their effective capacity to influence the relationship. From the perspective of community partners, Darby et al. (2023) emphasize communication, sustained exchange, and participation in educational processes. These approaches help explain why bidirectionality in the interviews encompasses meanings ranging from the demonstration of contributions to listening, methodological adaptation, continuity, and the transformation of academic practices.

In Chilean universities, the incorporation of bidirectionality into policies, registration systems, and evaluation mechanisms gives it a specifically organizational dimension (Irarrázaval, 2020; Araya Alarcón, 2024, 2025). The findings show that this common institutionalization allows for respecification according to the decisions, practices, and positions from which VcM is observed.

This reading introduces a qualification to approaches aimed at operationalizing bidirectionality through classification and measurement instruments. Such devices can guide initiatives, compare experiences,

and produce evidence for quality assurance (Acero et al., 2024; Araya Alarcón, 2024, 2025; Sandoval-Cuevas et al., 2024). At the same time, the categories they incorporate participate in configuring what the organization can recognize and treat as VcM. As research on the constitutive effects of evaluation has shown, instruments intervene in the conditions of intelligibility of the practices they observe (Dahler-Larsen, 2014). Bidirectionality can thus redescribe activities previously inscribed as teaching or applied research, establish equivalences among heterogeneous experiences, and prospectively orient the design of new initiatives.

Coding establishes categories and criteria of legibility, while inscription converts an experience into a form capable of circulating within them. Because registration systems reinterpret completed activities and their categories can be anticipated during project formulation, information production, organizational decisions, and the design of practices condition one another recursively (Power, 1997; Shore & Wright, 2015; Dahler-Larsen, 2014).

The articulation between organizational selectivity and exteriority also makes visible what exceeds a particular inscription (DeLanda, 2021). An academic relationship may have little institutional visibility while retaining continuity through trust and trajectory. A course may simultaneously participate in educational processes, territorial relationships, and evaluation mechanisms. Likewise, a registration system may produce institutional information without connecting to the academic conditions required to sustain the registered practice. Luhmann (2007) allows us to reconstruct how certain differences acquire intelligibility and connective capacity within the organization, while DeLanda (2021) allows us to recognize that selected components retain relations and capacities not exhausted by that operation.

It is on this movement that the notion of an ecology of couplings demonstrates its analytical value. Analysis of a single relation can reconstruct how two components come to condition one another recurrently; ecological analysis adds the question of which other relations determine whether that coupling retains, expands, or loses capacity. This is not a meta-relation detached from the evidence, but a strategy for reconstructing partial dependencies.

The organizational–registral, academic–disciplinary, and territorial–relational zones express concentrations of these dependencies in the material analyzed. Their contribution goes beyond classifying each practice within a domain; their purpose is to trace trajectories that cross these domains. A territorial experience may sustainably modify a course while retaining low institutional inscription. An initiative may achieve high registral visibility while remaining weakly connected to academic recognition. Funding may temporarily stabilize a relationship and later conflict with the rhythms required to build trust. The zones acquire meaning through these connections and decouplings.

This perspective speaks to literature linking the consolidation of community engagement to organizational supports and intermediary functions (Holland, 1997; Furco, 2002; Weerts & Sandmann, 2010; Saltmarsh et al., 2019; Wahyuni et al., 2024). Personal trajectories and academic networks may sustain relationships beyond the duration of specific projects, although their institutional stability depends on articulation with resources, time, and recognition. Renick et al. (2025) show that support for

community-engaged scholarship requires combining material and organizational supports. The interviews add that the effectiveness of these supports also depends on how they are linked to one another and on their compatibility with territorial and academic temporalities.

The same perspective also addresses transformation associated with expectations of reciprocity. The effects of participatory collaborations can accumulate and follow trajectories that exceed the immediate outcomes of an initiative (Jagosh et al., 2012, 2015). Visser et al. (2026) likewise show that reciprocity takes different forms depending on the configuration of relations and benefits involved. In the cases analyzed here, transformations acquire different degrees of inscription in academic practices and organizational devices. Their persistence depends on the couplings that connect them to subsequent decisions.

The analytical utility of the model can be stated concretely. When an initiative appears territorially robust but fails to achieve institutional continuity, the ecology of couplings avoids explanations centered on a single deficiency and instead reconstructs which relations sustain the experience, which fail to connect, and where interruption occurs. The same procedure can be applied to VcM policies, programs, or systems: tracing how a semantics is translated into criteria, how those criteria are inscribed in devices, how devices connect with academic practices, and which supports allow the resulting modifications to persist. The challenge posed by this approach goes beyond asking whether bidirectionality exists; it is to locate the dependencies that allow a relationship to produce effects beyond the episode in which it occurs.

This use also has a comparative implication. Two universities may employ similar definitions of bidirectionality yet produce different configurations because the couplings among registration, resources, academic recognition, teaching, and territorial relations have different degrees of consistency. Conversely, institutions with different normative languages may achieve similar capacities through different compositions. The proposal thus enables comparison among configurations without presupposing a single sequence of institutionalization or reducing analysis to the presence of isolated components.

6. Conclusions

This study examined how bidirectionality is organizationally configured in the VcM of Chilean regional state universities. The findings show that although the category is established in normative and institutional vocabularies, it acquires different meanings and capacities when taken up by policies, registration systems, funding calls, disciplines, courses, and academic trajectories. In this sense, bidirectionality is analytically more productive as organizational semantics than as a general property of the university–territory relationship. Its variation is not merely an implementation deficit but part of the process through which a common reference becomes operational in a complex organization.

The articulation of systems theory and assemblage theory specifies this process through an explicit division of conceptual labor. Luhmann (2007) makes it possible to reconstruct operations of selection,

observation, and decision, while DeLanda (2021) contributes relations of exteriority, relational capacities, and processes of stabilization. Organizational selection makes a difference intelligible, but it does not exhaust the relations or capacities of what has been selected.

The principal theoretical contribution lies in the notion of an ecology of couplings. A coupling designates a recurrent relation capable of modifying the possibilities of continuity, inscription, or action of the elements involved. The ecology is the configuration formed when the capacity of one coupling partially depends on others. Its analytical value lies in showing that the stability of a territorial, academic, or organizational relation changes according to its connections with resources, records, recognition, temporalities, and other relations capable of reinforcing, redirecting, or interrupting it.

Empirically, the organizational–registral, academic–disciplinary, and territorial–relational zones represent densifications within a single configuration rather than independent compartments. A territorial relation may modify an academic practice without achieving curricular inscription; a registration system may produce memory and visibility without connecting to decisions about resources or recognition; and funding may enable an initiative while introducing temporalities incompatible with trust building. Rather than exceptions, these trajectories can be understood as forms of uneven stabilization produced by connections and decouplings among zones.

In operational terms, the proposal makes it possible to identify which couplings sustain a practice, how they condition one another, and where their chaining is interrupted. Faced with an initiative that is territorially robust but fails to achieve institutional continuity, the model reconstructs the dependencies explaining that trajectory without reducing it to a single deficiency. The same operation enables comparison among institutions, programs, and practices by attending to the relational architecture sustaining their capacities rather than only to compliance with a definition of bidirectionality.

The qualitative analysis, built from university observations, offers an illuminating reconstruction of the ways in which bidirectionality is selected, translated, and inscribed in the organization. On this basis, the research program should be extended by incorporating the perspectives of territorial organizations and communities alongside direct observation of devices in use. Ethnographic and longitudinal follow-up would broaden understanding of how the identified differences are observed, translated, and modified from different positions, including those that the university constructs as its environment.

Beyond bidirectionality, the proposal offers an analytical hypothesis for studying other semantics that enter universities and acquire unequal capacities as they circulate among decisions, practices, and devices. Quality, impact, relevance, sustainability, interculturality, or territorialization can be examined by tracing how they are respecified, which relations allow them to produce effects, and which decouplings limit their continuity. The contribution of the ecology of couplings, in this sense, is to explain why a category may be widely institutionalized and yet acquire different capacities depending on the relational configuration in which it participates.

Declarations

Author Contribution

D.V. conceived and designed the study, developed the theoretical framework and methodology, conducted the data collection and analysis, interpreted the findings, and wrote, reviewed, and edited the manuscript. D.V. read and approved the final manuscript.

Acknowledgement

The author would like to thank Tomás Koch Ewertz for his invaluable guidance, thoughtful feedback, and sustained support throughout the development of this research and manuscript.

Data Availability

The qualitative data generated and analyzed during the current study are not publicly available because they contain information that could compromise participant confidentiality and are subject to the conditions established through informed consent and institutional ethical approval. Anonymized data may be available from the author upon reasonable request, subject to ethical and confidentiality considerations.

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