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Ecosystem of a collaborative research center in project studies: A conceptual framework

Ecossistema de centro de pesquisa universitária em *project studies*: Um *framework* conceitual

José da A. Moutinho[1,2], Roque Rabechini Junior[2], and Gabriela Fernandes[3]

[1] State University of Rio de Janeiro, Rio de Janeiro, RJ, Brazil
[2] Nove de Julho University, São Paulo, SP, Brazil
[3] University of Coimbra, Coimbra, Portugal

Authors' notes

José da A. Moutinho is now a project manager in R&D at State University of Rio de Janeiro (Universidade do Estado do Rio de Janeiro – UERJ); Roque Rabechini Junior is now a professor at the Postgraduate Program in Project Management of Nove de Julho University (Universidade Nove de Julho – Uninove); Gabriela Fernandes is now an assistant professor at the Faculty of Science and Technology of University of Coimbra (Universidade de Coimbra – UC).

Correspondence concerning this article should be addressed to José da A. Moutinho, Rua São Francisco Xavier, 524, Maracanã, Rio de Janeiro, Rio de Janeiro, Brazil, ZIP code 20.550-900. Email: moutinho_pmp@yahoo.com.br

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Abstract

Purpose: To provide a conceptual framework of the ecosystem of a collaborative research center in project studies. The ecosystem is an environment capable of articulating and integrating different actors, such as academics and practitioners from public and private organizations, nongovernmental organizations, and professional associations. Furthermore, it discusses theoretical and empirical frontiers in project studies and produces knowledge and technologies directly applicable to organizations, generating impact at the individual, organizational, and social levels.

Originality/value: The creation of a collaborative workspace that includes academics and practitioners in the co-production of knowledge has been highlighted as critical to driving project management forward. The framework establishes a common language among academics and practitioners to enhance the impact of the results of collaborative research on project management.

Design/methodology/approach: A systematic literature review was carried out from a search on the Scopus and Web of Science databases, with 11 frameworks being evaluated from the perspective of sustainable impacts. The most appropriate framework was identified, analyzed, and enriched with an additional layer dedicated to project management.

Findings: The conceptual framework proposed comprises four layers: project studies, process (resources, activities, outputs, outcomes, and impacts), supporting mechanisms and circumstances, and context. For future studies, we suggest adding empirical data to the proposed structure and evaluating the framework in a collaborative academic environment.

Keywords: research center, collaborative research, project management, project studies, framework

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Resumo

Objetivo: Propor o *framework* conceitual do ecossistema de um centro de pesquisa universitária em *project studies*. Trata-se de um ambiente capaz de articular e integrar distintos atores, como acadêmicos e praticantes de organizações públicas e privadas, organizações não governamentais e associações de classes, com o propósito de discutir fronteiras teóricas e empíricas em *project studies* e produzir conhecimento e tecnologias diretamente aplicáveis às organizações, e assim gerar impacto em nível individual, das organizações e da sociedade.

Originalidade/valor: A criação de espaço colaborativo, envolvendo acadêmicos e praticantes, para coprodução de conhecimento, tem sido apontada como crítica para impulsionar a área de gestão de projetos. O *framework* estabelece uma linguagem comum entre acadêmicos e praticantes para potencializar o impacto dos resultados de pesquisas colaborativas em gestão de projetos.

Design/metodologia/abordagem: Foi realizada uma revisão sistemática da literatura a partir de uma busca nas bases de dados Scopus e Web of Science, e avaliaram-se 11 *frameworks* sob a perspectiva de impactos sustentáveis. O *framework* mais aderente foi identificado, analisado e enriquecido com uma camada adicional dedicada à área de gestão projetos.

Resultados: O *framework* conceitual proposto é composto por quatro camadas: *project studies*, elementos processuais (recursos, atividades, resultados diretos, indiretos e impactos), mecanismos organizacionais de suporte e circunstâncias, e contexto. Como estudos futuros, sugerem-se a agregação de dados empíricos à estrutura proposta e a avaliação do *framework* em um ambiente acadêmico colaborativo.

Palavras-chave: centro de pesquisa, pesquisa colaborativa, gestão de projetos, pesquisa universitária, *framework*

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INTRODUCTION

One way universities have found that increases research relevance has been to work closely with external organizations, relying on the triple helix model (Etzkowitz & Leydesdorff, 1998). This widely promulgated model (Kurowska-Pysz & Walanci, 2017; Mascarenhas et al., 2019) is grounded on the principle of the production and exploration of knowledge through collaboration between industry, academia, and government (Faccin & Balestrin, 2015; Ribeiro & Nagano, 2018), giving rise to the emergence of intraorganizational ecosystems (Moore, 1998).

This is a process through which organizations can engage in a continuous cycle of interdependent changes (Moore, 1993). Ecosystem analogies do not refer to individual actors but, rather, to interactions between actors in the same environment and the creation of value that a single organization could not create by itself (Durst & Poutanen, 2013). From this perspective, a university context can be seen as an ecosystem consisting of actors with the ability to engage with external organizations through collaborative interfaces (Fukuda & Watanabe, 2008). The consequent narrowing of relationships between researchers and practitioners increases the relevance of the knowledge produced, which has been discussed in several disciplines (Cherney & McGee, 2011; Crona & Parker, 2011; Pettigrew, 1997).

The issue is also very much on the agenda of project management researchers. Academia, in pursuit of a practical component, is faced with a complex scenario that would be suitable for the generation of new ideas and challenges to the dominant theory (Walker, 2008; Walker et al., 2008). Indeed, project management still lacks the wherewithal to further impact its field of operations in a positive way (Fernandes et al., 2020; Söderlund & Maylor, 2012), especially given that its conceptual basis remains open to criticism for its lack of relevance (Geraldi & Söderlund, 2016; Morris, 2010; Söderlund & Maylor, 2012). With no solid theoretical basis, it is difficult for research to converge on the robust conclusions necessary for its application by practitioners (Padalkar & Gopinath, 2016).

Research in the field of projects, however, is diversifying rapidly (Geraldi & Söderlund, 2018). Scholars have broadened their theoretical, epistemological, and ontological bases. They have extended the focus of studies beyond projects themselves and their management and embraced individual aspects, teams, organizations, and society in general (Padalkar & Gopinath, 2016). Despite this change of focus, research on this field remains linked to the same conceptual family (Jacobsson et al., 2015), which supports the idea

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of project studies as an integrative concept for study in, on, and around projects (Geraldi & Söderlund, 2016, 2018).

In the social sciences, a university research project can be seen as a system formed by researchers, their interactions, all the elements that mediate them, the external participants – if there is any –, the perspectives of each of the actors, and their objectives (Zittoun et al., 2007). They are characterized as complex organizational environments with specific requirements (Löhr et al., 2018) and multiple conflict factors (Löhr et al., 2017).

Research produced in collaboration with practitioners is more liable to be used in practice, with potentially more effective impacts, compared to research conducted alone (Cheruvelil et al., 2014). Impacts are understood to be the indirect outcomes of collaborative environments that can take place at the individual level, such as academics, students, and practitioners; the organizational level, such as universities, research centers, and companies; and at the level of society, such as the community, science, or even geographical region (Kellogg Foundation, 2004).

However, collaborations can be paradoxical, as they can involve contradictions caused by differences between partners. According to the Collaborative Advantage Theory, their structuring revolves around the tension between the synergy created through joint work and the inertia to produce results. Collaboration management should focus on the potential advantages arising from such partnerships in light of the interplay of issues such as purpose management, trust, culture, and leadership (Huxham & Vangen, 2005). Factors influencing research collaborations are not only of interest to the researchers involved but also to organizations (Bukvova, 2010). Several organizations have tried to encourage collaboration by creating research centers or funding university research (Sonnenwald, 2007).

Some initiatives involving long-term collaboration between academia and external actors, such as industry, demonstrate promising attempts at innovation in knowledge co-production (Fernandes et al., 2020). Several research centers, in collaboration with leading companies, were created in the early 21st century (Söderlund & Maylor, 2012), which bear witness to the enormous potential of studies in project management (Berggren & Söderlund, 2011; Geraldi et al., 2020). Indeed, the possibility of the creation of collaborative spaces has been highlighted as critical to boosting knowledge in the field of management (Nowotny et al., 2003). There are records in the literature of successful long-term partnerships between companies and educational institutions in project management (Söderlund & Maylor, 2012). However, thorough research must be conducted to benefit and use such meaningful collaborations (Söderlund & Maylor, 2012).

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The study conducted by Berggren and Söderlund (2011) indicates the potential of the teaching of project management to create a space for knowledge co-production, so that research can be developed with the involvement of academics and practitioners: the *agora*, according to Nowotny et al. (2003). This is an integrative environment where such actors can address project management issues and then discuss and propose solutions (Söderlund & Maylor, 2012).

One way this space can be materialized in the university context is through the university research center. Indeed, university research centers have historically been seen as one of the main strategies for increasing such long-term collaborations and interactions (Thune & Gulbrandsen, 2011) between universities and external organizations in many developed countries (Chai & Shih, 2016; Ponomariov & Boardman, 2010). As a central feature, the university research center has an explicit mission (Boardman & Gray, 2010). Indeed, it seeks to promote collaboration with actors external to the university (Bozeman & Boardman, 2003; Moutinho & Rabechini, 2021). University research centers are perceived as specific mechanisms through which companies and universities can create organizational bridges across the boundaries of cultural and structural differences (Nursall, 2003). Their creation fills gaps between universities and external organizations previously unfilled by either the university itself or by its laboratories and academic departments (Ponomariov & Boardman, 2010; Styhre & Lind, 2010).

Thus, this research seeks to precisely address this identified gap with the question that guides the research:

- How can the ecosystem of a collaborative research center for project studies be conceptually represented in such a way as to enhance the impact of its results at the individual, organizational, and social levels?

This study therefore aims to propose a conceptual framework for the ecosystem of such a collaborative research center in project studies. This is an environment capable of bringing together and integrating different actors, such as academics and practitioners from public and private organizations, non-governmental organizations and professional associations, to discuss theoretical and empirical boundaries in project studies, and produce knowledge and technologies directly applicable to organizations, thereby generating impact on the individual, organizational and societal levels.

As a research result, the conceptual framework of the ecosystem of the research center for project studies is proposed. This framework is grounded in conceptual research as a non-empirical method (Mora et al., 2008) of

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designing a new artifact (Simon, 1996) from the integration of pre-existing structures (Meredith, 1993). The study initially relied on a systematic literature review using the Web of Science and Scopus databases: 28 studies were selected. The studies were subsequently assessed, categorized, and analyzed, generating a final sample of 11 studies (frameworks).

The proposed framework is defined as the graphic explanation and narrative form of the main elements to be studied – the main factors, constructs, or variables and the supposed relationships between them (Miles & Huberman, 1994). Its composition starts with the macroelements (project studies, resources, activities, outputs, outcomes, impacts, circumstances, support mechanisms, and context), which are then broken down into elements and subelements that characterize the collaborative environment in project studies.

RESEARCH METHODOLOGY

In order to address the research question, a systematic literature review was conducted. For Stamer et al. (2016), developing frameworks from a literature review has been a widely accepted practice since it makes explicit the process of obtaining knowledge from previous scientific research. The systematic literature review was conducted to identify and analyze previous research that had developed frameworks for collaborative environments involving academia and external actors. Its main objective is to provide a collective view of the synthesis and analysis of existing research (Tranfield et al., 2003). Considering the knowledge already produced helps to explain the importance of building an artifact – defined by Simon (1996) as artificial, designed by man – as an organization of internal components that will achieve the objectives of a given external environment.

The research was carried out through a process comprising a sequence of predefined and replicable phases: location of studies, selection and assessment, and analysis and synthesis (Tranfield et al., 2003). The systematic literature review followed the core principles defined in previous research that apply to the fields of management and organizations (Denyer & Tranfield, 2009).

The first research phase was characterized by the definition of the search query expression and the identification of studies in the Web of Science and Scopus databases. The choice of these databases was based on the fact that they index relevant and traditional journals in the academic community (Archambault et al., 2009). Strings were structured following the syntax of

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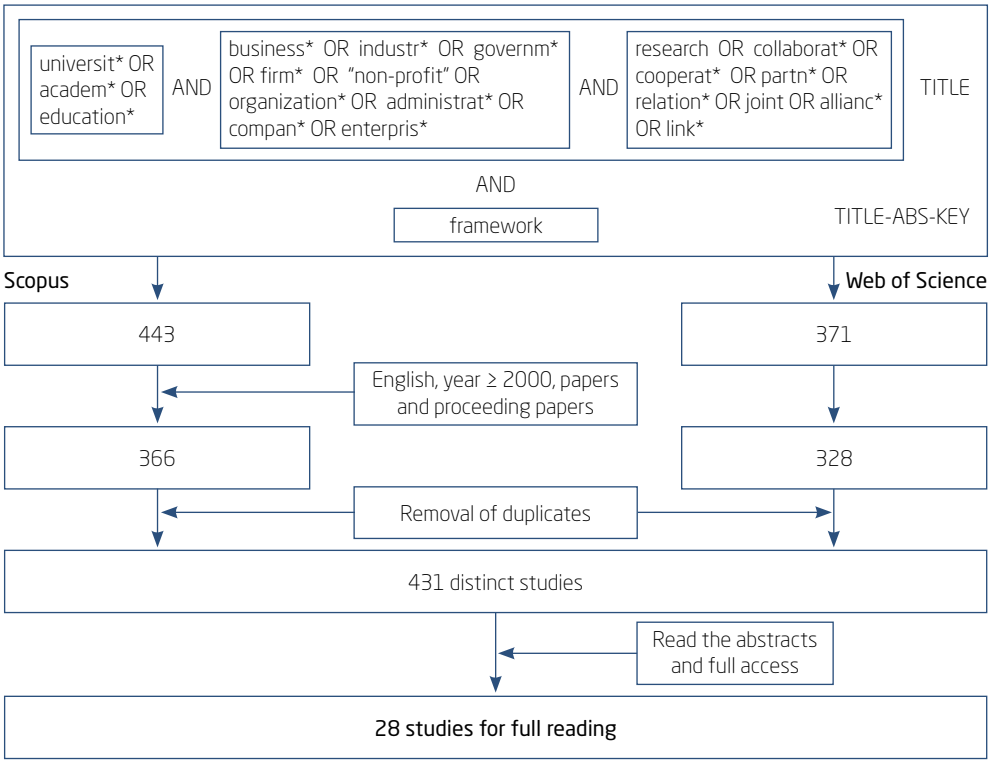
each of the search engines from the arguments defined in Figure 1. As can be seen, the authors chose to include multiple arguments, thus enabling a comprehensive set of initial results. The figure presents the results obtained taking into account the application of the inclusion criteria in the sample: written in English; published as of 2000; consisting of scientific articles or conference proceedings papers whose central theme is the development of the reporting of a framework for a collaborative environment involving multiple participants and the academic environment.

Figure 1

Search process on the Web of Science and Scopus databases



Source: Elaborated by the authors.

In the second phase, relevant studies were selected and assessed in the light of the research question and then analyzed by two authors who independently extracted data from them. The authors agreed upon both the definition of the search terms and the guidelines for interpretation specifications to decrease the margin of error, thus producing a more robust dataset (Tranfield et al., 2003).

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Reading the abstracts limited the initial sample to the scope of the research, given that the majority of the studies concerned *phenomena* associated with collaborative environments. Therefore, exclusion criteria were established for studies published only as abstracts, such as the conference proceedings papers and those with no full access. The final sample resulted in 28 studies for full reading and analysis, consisting of six proceedings papers and 22 papers complete the set. Sixteen studies were published between 2018 and 2020, five studies are from the years 2015 to 2017, and seven papers were published before 2015.

Among the journals that published the studies, *Industry & Higher Education* stands out, with three articles. The rest of the articles were published in various journals, such as *Research Policy*, *Supply Chain Management*, *Journal of Technology Transfer*, *International Journal of Managing Projects in Business*, among others – with only one study published in each of these. The evaluation process considered Stamer et al.'s (2016) characterization for frameworks: layered, technical, sequential, categorized, factors-outcomes, component-based, and non-categorizable. It was thus possible to group them according to predominance with the purpose of identifying characteristics in common.

In the third phase, a spreadsheet was developed to organize the sample studies. The elements that make up the spreadsheet are title, abstract, year, type of study (article or proceedings), name of journal or event, authors, keywords, research aim, method, main findings, and limitations.

Finally, the process of analyzing the sample papers resulted in the final selection of 11 frameworks involving collaborative environments. Although the literature records several models of evaluation for artifacts, such as Hevner et al. (2004), Sonnenberg and vom Brocke (2012), and Venable et al. (2012), each framework was analyzed and evaluated by the authors in the light of the Fitness-Utility Model, defined by Gill and Hevner (2013). The authors consider that the assessment of artifacts should be carried out from the perspective of a sustainable impact, that is, they understand that the evolving adequacy of an artifact is more valuable than its immediate utility.

RESEARCH RESULTS

Frameworks of collaborative environments

The synthesis of the 11 frameworks of the final sample involving collaborative environments, as identified in the literature, is presented in Table 1.

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Table 1

Synthesis of frameworks in the final sample

Authors	Framework	Focus	Categorization
Alunurm et al. (2020)	Cooperation between higher education institutions and industry	A linear process with phases of motivation, choice of form of cooperation, engagement, results, and impacts on an environment with barriers and facilitators.	Sequential
Ankrah and AL-Tabbaa (2015)	The conceptual framework for the university-industry collaboration process	Formed using certain dominant key aspects: motivations, forms of collaboration, formative process, activities, factors that enhance and inhibit collaboration, and outcomes. The study points to an underlying theory of university-industry collaboration starting from an integrative view of several others.	Sequential
Chen et al. (2020)	University-industry collaboration for teaching in building information modeling	The framework emphasizes the importance of contributions from both parties toward *curriculum* development, the pedagogical project, and the delivery of courses, which have been organized purely by academia.	Factors-outcome
Cuevas et al. (2019)	University-industry relationship and co-working in research and development (R&D) and innovation	The framework consists of three integrated blocks: reception, coordination, and delivery. In turn, each block is formed by a set of units that interconnect following a procedural logic.	Sequential
Daoud et al. (2017)	Framework for evaluating R&D partnerships between universities, industry, and government	Definition and evaluation of the results and impacts of R&D partnerships between universities, industrial groups, and government agencies. Each component of the framework presents a list of criteria aligned with the concepts of inputs, outputs, and outcomes for R&D partnerships.	Sequential
Galán-Muros and Davey (2019)	The framework of the university-business cooperation ecosystem	This framework combines macroelements (processes, circumstances, support mechanisms, and context) with structural and functional features, capturing both general and specific aspects of the collaborative environment.	Sequential
Kochanek et al. (2015)	Logic model of university research	Composed of sequential (inputs, processes, outputs, and outcomes) and parallel (alliances, team-building projects) phases, the framework maps the use of theories on knowledge use, group process, and trust building to integrate professionals into the research process in order to produce more relevant and useful work.	Sequential

(continue)

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Table 1 (conclusion)

Synthesis of frameworks in the final sample

Authors	Framework	Focus	Categorization
Matzner et al. (2018)	Joint research project on research services	Comprising design, feasibility analysis, development, and service launch. The last phase of the framework contains the results of the jointly executed projects, which translate into impacts on scientific research, society, and the policy system and may reveal the need for further research in any of the three segments.	Sequential
Pastakia et al. (2020)	The framework of the academic-biopharmaceutical industry	A framework built around five core principles: contextualization, collaboration, prioritization of local needs, institutional commitment, and integration. Each principle adds a different layer to develop a standard set of goals that could have divergent interests.	Factors-outcome
Philbin (2008)	Process model for university-industry research collaboration	Framework for a collaborative macrostructure involving five successive steps: mapping, proposition, initiation, delivery, and evaluation. This sequence is supported by the technical and business missions that allow for the collaboration to be related to these areas of information as essential parts of the process and related to value creation. The model also includes the elements of social capital and the collaboration agent.	Sequential
Rybnicek and Königsgruber (2018)	The conceptual model for successful university-industry collaboration	This framework identifies factors that influence the success of university-industry collaborations. The factors were categorized into institutional, relationship, output, and environmental components. Circumstances that can impact collaboration were also identified.	Factors-outcome

Source: Elaborated by the authors.

As shown in Table 1, the frameworks that make up the final sample are heterogeneous. They were categorized, according to Stamer et al. (2016), into sequential frameworks, which focus on the order in which activities are performed among the elements that make up the framework and factors-outcome frameworks, which consider relevant factors and determine how these factors influence certain *phenomena* present in the frameworks' environments. As shown in Table 1, most frameworks are sequential, they are focused on the logical order that guides the arrangement of the elements that make up each framework.

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Conceptual framework of the ecosystem of a collaborative research center in project studies

As mentioned in the research methodology, the 11 frameworks were analyzed and evaluated by this study's authors, bearing in mind the criteria defined by Gill and Hevner (2013), as illustrated in Table 2. The results showed the framework developed by Galán-Muros and Davey (2019) to be the closest to the proposal, whose application finds precedents in the studies of Chryssou (2020) and Pinto and Fernandes (2020). Its structure forms the basis for developing the conceptual framework of the ecosystem of a collaborative research center for project studies. However, elements to characterize the project management field must still be incorporated. Thus, we resort to Meredith (1993), who defines the metaframework as a conceptual method based on integrating pre-existing frameworks. Such a framework is based on conceptual research as a non-empirical method, using considerations of existing theoretical concepts. They refer to conceptual studies, such as designing a new conceptual artifact, whether it is a construct, framework, model, method, process, or even a system or component (Mora et al., 2008).

Thus, the proposed framework is presented in four layers (Figure 2). The first, core to the structure, is named project studies and represents the field of application for which the framework is intended. In this layer, the intended study's level of analysis is defined: from the individual level to society (Geraldi & Söderlund, 2018). This layer also considers the distinct ontological orientations, epistemological anchorages, and methodological procedures to be adopted (Lauriol, 2006). The subsequent layers are anchored in Galán-Muros and Davey's (2019) framework.

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Table 2

Evaluation of the selected frameworks

Frameworks	Fitness-utility model							
	Applicability	Decomposition	Flexibility	Reuse	Evolution	Novelty	Interest	Elegance
Alunurm et al. (2020)	◐	●	◐	◐	◐	◐	◐	●
Ankrah and AL-Tabbaa (2015)	◐	●	●	◐	◐	◐	◐	●
Chen et al. (2020)	○	○	◐	◐	◐	◐	○	●
Cuevas et al. (2019)	○	◐	◐	◐	●	○	○	◐
Daoud et al. (2017)	◐	◐	◐	●	●	●	◐	●
Galán-Muros and Davey (2019)	◐	●	●	◐	●	●	●	●
Kochanek et al. (2015)	◐	◐	○	◐	◐	○	◐	●
Matzner et al. (2018)	◐	◐	●	●	●	◐	◐	●
Pastakia et al. (2020)	○	◐	◐	◐	●	◐	◐	●
Philbin (2008)	○	○	○	○	◐	◐	○	●
Rybnicek and Königsgruber (2018)	◐	●	◐	◐	●	◐	●	●

Source: Elaborated by the authors.

Note. ○ = weak; ◐ = moderate; ● = strong.

The second layer addresses the logical processes required to create impact. It is based on the logic model (Kellogg Foundation, 2004), composed of five essential components: inputs, activities, outputs, outcomes, and impacts, in a feedback system that works under certain environmental conditions to solve identified problems (Galán-Muros & Davey, 2019). Theoretically, the logic model can be seen as a program (Wholey, 1987). Program theory represents a plausible and sensible model for how a program should work (Bickman, 1987). It identifies its resources and activities, as well as the intended results. Furthermore, it specifies a chain of causal assumptions linking the program's resources, activities, intermediate outputs, and impacts.

The third layer comprises circumstances of the environment that affect collaboration and the support mechanisms that underpin the collaborative environment (Galán-Muros & Davey, 2019; McLaughlin & Jordan, 2015). Circumstances are elements of temporary influence that are both internal and external to the collaborative environment. The function of collaboration support mechanisms is to set up favorable conditions in which collaboration can prosper with regard to policies, strategies, structures, and specific activities.

The fourth layer is defined by the context in which the collaborative environment is embedded. The context is represented by the permanent external factors influencing the collaborative process (Galán-Muros & Davey, 2019). Thus, the proposed conceptual framework for the ecosystem of the research center for project studies is presented in Figure 2, in which the sequence is detailed. Its flexible format allows for the incorporation of new elements as they are identified.

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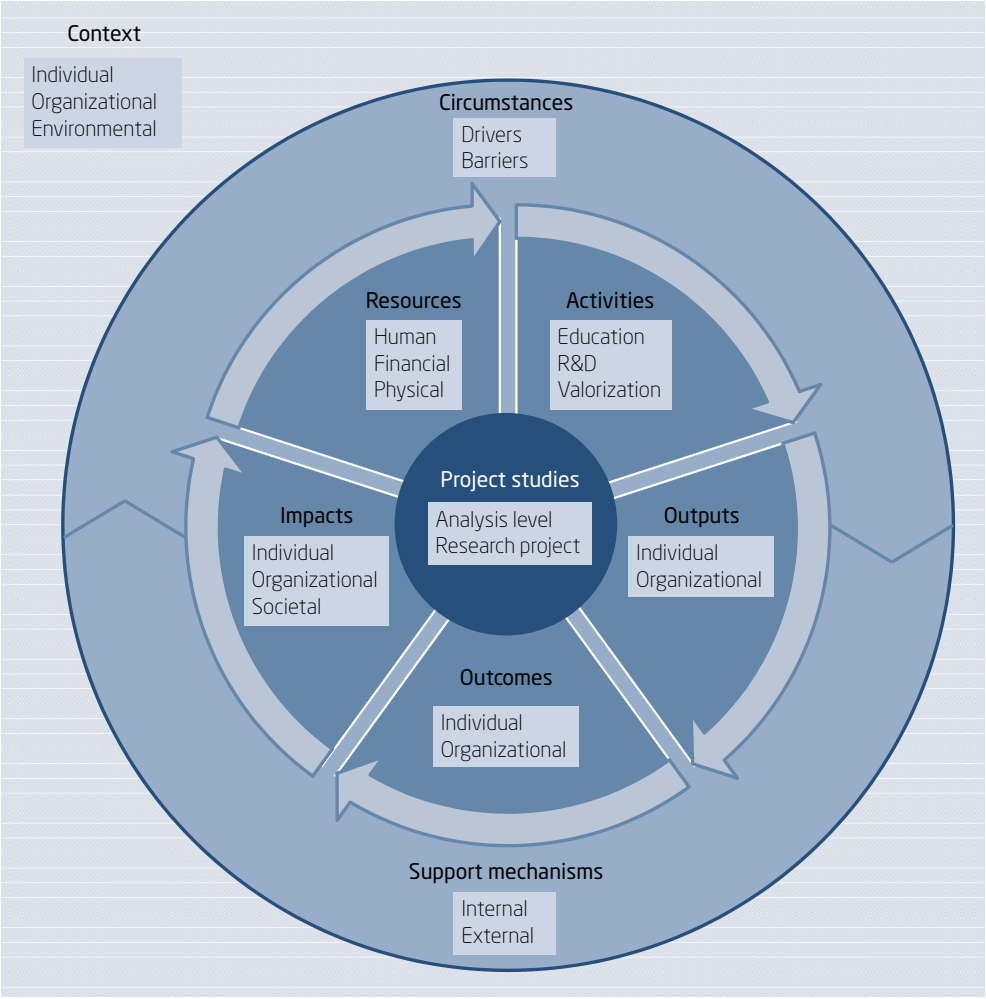
Figure 2

Conceptual framework of the ecosystem of a collaborative research center for project studies



Source: Elaborated by the authors.

Elements of the proposed framework

- *Project studies*: This element generically defines studies in the field of the project whose scope can be set at different levels: the microlevel (individual and project team); the mesolevel (project and its management); and the macrolevel (organization and society) (Geraldi & Söderlund,

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2018). These levels can incorporate distinct ontological orientations, epistemological anchorages, and methodological procedures (Lauriol, 2006). The approach recognizes the input of scholars from other disciplines who address the field and who become increasingly interested in studies in project management, adding theoretical frameworks, disciplinary backgrounds, and alternative ways of conducting research (Grabher & Ibert, 2014).

- *Resources*: These comprise all the resources potentially available for use in the activities of the collaboration and that contribute in various ways to the achievement of its success (Galán-Muros & Davey, 2019; Rybnicek & Königsgruber, 2018). The typology considered comprises human (Cuevas et al., 2019; Daoud et al., 2017; Kochanek et al., 2015), financial (Daoud et al., 2017), and physical resources (Daoud et al., 2017).
- *Activities*: Collaborative activities between universities and external actors can be defined as collaborative interactions (Ankrah & AL-Tabbaa, 2015; Daoud et al., 2017; Galán-Muros & Davey, 2019; Pastakia et al., 2020; Rybnicek & Königsgruber, 2018) and cooperative efforts to transfer or exchange knowledge, technologies or other characteristics between academics and members of any external organization, creating value in their outcomes (Davey, 2017; Davey et al., 2011; Galán-Muros & Davey, 2019). They occur as a result of interactions between actors (Kochanek et al., 2015), benefitting the information flow and technologies. Activities considered in the academic environment are teaching, research and development (R&D), and valorization (Drucker & Goldstein, 2007).
- *Outputs*: This element comprises products, services, or other attributes directly delivered to individuals or organizations (Alunurm et al., 2020; Cuevas et al., 2019; Daoud et al., 2017; Kochanek et al., 2015; Rybnicek & Königsgruber, 2018) as short-term results of the collaborative process (Galán-Muros & Davey, 2019). According to Kellogg Foundation (2004), these outputs depend exclusively on the activities involved, taking into account the allocated resources.
- *Outcomes*: These represent the benefits or losses from the outcomes of the collaboration process (Ankrah & AL-Tabbaa, 2015; Chen et al., 2020; Daoud et al., 2017; Galán-Muros & Davey, 2019; Rybnicek & Königsgruber, 2018) that directly affect the stakeholders involved (van Der Sijde, 2012). Changes arising from the effects of the collaboration's outputs (Kochanek et al., 2015) can be experienced over the medium term (Kellogg Foundation, 2004).

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- *Impacts*: These are the indirect results of the collaborative process (Alunurm et al., 2020; Daoud et al., 2017; Kochanek et al., 2015) as experienced by individuals, institutions, and society (Galán-Muros & Davey, 2019). Impacts are expected to result from the benefits accrued through indirect outcomes (Kellogg Foundation, 2004).
- *Support mechanisms*: These are understood as measures to support the development of collaboration between the academic environment and external actors. Given that collaboration is, in its nature, a complex *phenomenon*, it requires specific mechanisms (Orazbayeva et al., 2019). Support mechanisms have, therefore, as their main functions to manage, develop, and coordinate the activities of the collaborative environment necessary for its operation (Ankrah & AL-Tabbaa, 2015; Cuevas et al., 2019; Galán-Muros et al., 2017; Kochanek et al., 2015; Korff et al., 2014; Rybnicek & Königsgruber, 2018). Regarding their origin, support mechanisms can be external, in the form of public policies, or internal, such as strategic, structural, or operational (Galán-Muros & Davey, 2019).
- *Circumstances*: These are internal and external factors that have temporary influence on the collaborative environment, inhibiting or driving the collaborative process (Alunurm et al., 2020; Galán-Muros & Davey, 2019), and that can be changed through managerial actions (Ankrah & AL-Tabbaa, 2015; Galán-Muros et al., 2017; Rybnicek & Königsgruber, 2018). The circumstances considered in the framework adopt the concepts of the barrier of Bruneel et al. (2010) and drivers of D'Este and Perkmann (2011).
- *Context*: This element represents factors that depend on the collaboration and are defined by the fixed environment and that affect the collaborative process (Ankrah & AL-Tabbaa, 2015), such as the personal characteristics of those involved, the collaborating organizations, and the environment in which the collaboration occurs (Galán-Muros & Davey, 2019).

Table 3 summarizes the macroelements, elements, and subelements considered in the conceptual framework of the proposed ecosystem:

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Table 3

Breakdown of the framework's macroelements

Macroelements	Elements	Subelements
Project studies	Level of analysis	Microlevel (individual and project team)
		Mesolevel (project and management)
		Macrolevel (organization and society)
	Project design	The question and object of research
		Intention/aim
		Methodological mechanism
		Relevance
		Coherency
Resources	Human	Academics and researchers
		Students
		Practitioners and managers
	Financial	R&D funding
	Physical	Knowledge bases (bibliographical sources, software, artifacts, best practices)
		Facilities
Activities	Education	*Curriculum* design
		Lifelong learning
		Student mobility
	R&D	Professional mobility
		Joint R&D
	Valorization	The commercialization of research (such as licenses)
		Entrepreneurship (start-ups)
Outputs	Individual	Scientific, technical, and technological production
		Search results
	Organizational	Completed project
		The institutionalization of new knowledge and technologies
		Intellectual property (software, patents)
		Non-patentable processes

(continue)

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Table 3 (continuation)

Breakdown of the framework's macroelements

Macroelements	Elements	Subelements
Outcomes	Individual	Academics (discovery of knowledge gaps, practical application of results, new research opportunities)
		Students (practical experience, network expansion, access to business opportunities)
		Practitioners (better understanding of the *phenomena* surrounding projects, increased competencies)
	Organizational	Problem-solving skills
		Increasing the qualification level of practitioners
		Access to *alumni* experts
Impacts	Individual	Academics (increased professionalism, reputation, and scientific productivity)
		Students (increased value in the labor market, creating enhanced employability)
		Practitioners (increased learning, continuing professional development)
	Organizational	Organizations (improved quality of recruitment, enhanced corporate image, competitive advantage, new business deals)
		University (enhanced reputation and image, improved relevance of teaching and research)
	Societal	Community (impact on science, organizations, scientific networks, and practitioner communities)
Support mechanisms	External	Public policies (funding, incentives, regulation, recommendations)
	Internal	Strategic (formalization of the university research center, its mission, vision, and goals)
		Structural (staff, facilities, communication, software)
		Operational (prospecting, partnership management, knowledge management, governance)
Circumstances	Barriers	Limited interaction opportunities (lack of awareness of potential)
		Strategic differences and cultural imbalances
		Power imbalance
		Lack of resources to engage in collaborative research

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Table 3 (conclusion)

Breakdown of the framework's macroelements

Macroelements	Elements	Subelements
Circumstances	Barriers	Confidentiality
		Lack of assimilative capacity for knowledge or technology
	Drivers	Resources complementarity
		Personal relationship (trust as antecedent)
		A clear policy for the collaboration system
Context	Individual	Gender, age, and market experience of the academics
	Organizational	Organizational characteristics
	Environmental	Political, economic, social, and legal

Source: Elaborated by the authors.

The elements illustrated in Table 3 form the framework for the collaborative environment ecosystem in project studies and provide a shared understanding of the proposed environment for academics and practitioners. However, the complex and dynamic nature of this type of environment does not take into consideration that new arrangements may strengthen the structure as the concept is consolidated and collaborative research is materialized. Notwithstanding, the distinct views of actors are expected to enrich the framework and, thus, increase its applicability.

DISCUSSION AND CONCLUSIONS

This research aimed to propose a conceptual framework for the ecosystem of a collaborative research center for project studies. The study reveals that, despite frameworks identified in the specialized literature on collaborative environments, project management lacks a specific structure to enhance the impact of its implementation. The process elements (resources, activities, outputs, outcomes, and impacts), the organizational mechanisms of support, the circumstances, and the context need to be explicitly stated and integrated. They cannot be neglected at the risk of being restricted to a partial view of the ecosystem.

In consonance with Berggren and Söderlund (2011), who highlights the critical nature of the creation of an environment that discusses real problems, the collaborative environment formed by academics and practitioners of

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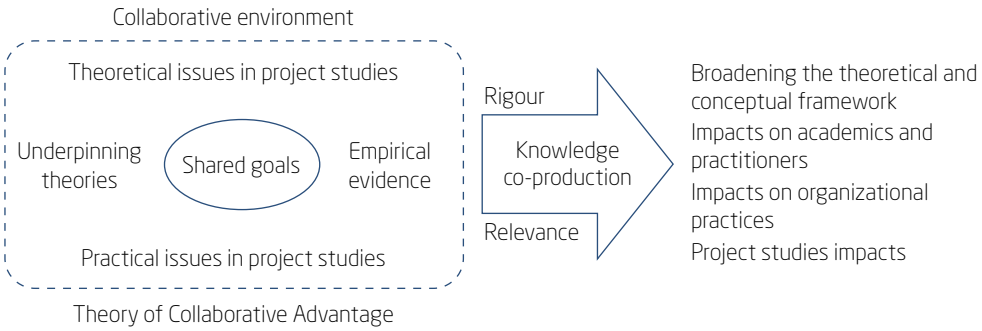
project management houses the best possible *locus* (research center) to address theoretical and practical issues, enabling the advancement of the field, always from an integrative perspective (Figure 3). Therefore, researchers cannot follow only the traditional paradigms applicable to social sciences that focus on explaining, describing, exploring, or predicting *phenomena* and their relationships (Hegenberg, 1969), but they must also expand the epistemological bases, including design science, which focuses on the construction of artifacts and prescriptive solutions (Ahlemann et al., 2013; Kabir & Rusu, 2016).

Figure 3

Theoretical-conceptual framework



Source: Elaborated by the authors.

The study provides theoretical contributions and practical implications, but it has limitations, which are opportunities for further research. The theory broadens the collaborative environment framework and extends it to project studies, making an essential contribution to this field. However, it is a framework representing a complex environment involving actors from multiple organizations guided not seldom by distinct institutional logics. A possible way to approach the complexity of collaborations is from the perspective of the collaborative advantage theory (Huxham & Vangen, 2005) by exploring issues related to partnership objectives, culture, communication, power, and trust, since they may be decisive for the success of collaborations. The proposed conceptual framework results from integrating complementary perspectives to enrich the understanding of the *phenomenon* that is the ecosystem of a research center for project studies.

As a practical implication, the environment guided by the framework proposed here may benefit academics and practitioners directly. Bringing

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practitioners together with academics helps to bridge the gap between research and practice, encourages knowledge co-production with an understanding of the value of research that questions practice, as supported by Söderlund and Maylor (2012), and increases the likelihood that research findings will create impacts at the individual, organization, and social levels. As the integration of the actors involved increases, and as they develop meaningful and lasting relationships based on trust and commitment, the necessary conditions to enhance the success and expansion of collaborative processes are created, as already indicated by Davey et al. (2011) and supported by the collaborative advantage theory (Huxham & Vangen, 2005).

As for practitioners, their involvement in systematic research on project management can bear fruit in said research's incorporation into the decision-making processes of organizations. Academics will add new knowledge, enrich research agendas, and improve the understanding of how scientific work can be designed and conducted so that it is directly relevant to practice.

Possible practical results can be expected to include technological products with a high level of novelty, resulting from the application of new scientific knowledge and developed techniques and expertise, used directly in solving problems in organizations that produce goods or provide services aiming at social welfare to the population in general. Therefore, expected technological developments will include intellectual property assets, training activities, publishing products, software, standards or regulatory frameworks, conclusive technical reports, manuals and protocols, technical-scientific databases, and processes and products that cannot be patented (Coordenação de Aperfeiçoamento de Pessoal de Nível Superior, 2019).

This study inevitably presents certain limitations. The first can be defined in terms of the research scope, given that two databases were a limited number, possibly leaving out journals that could also address the studied theme. Another limitation regards the other authors' different approaches to conceptual elements, which, somehow, may have interfered with the analysis process.

In future studies, we would suggest expanding those elements and subelements – whose origins may be both theoretical and empirical –, with a view to sustaining the structure, resulting in a more robust framework; evaluation of the framework in a collaborative academic environment, thus verifying its usefulness; and evaluation of possible implications for both academics and practitioners.

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