

Knowledge Exchange and Entrepreneurial Value in University–SME Collaboration

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Abstract: University–SME collaboration is widely promoted as a pathway to entrepreneurial renewal, yet the mechanisms through which collaboration generates entrepreneurial value—and the frictions that undermine it—remain unevenly specified in practice-oriented research. Building on a Triple Helix context where universities are expected to contribute to innovation and growth beyond teaching and research, this study asks: 1) Through what mechanisms and process stages does university–SME collaboration create entrepreneurial value? and 2) Which frictions weaken value creation, and what governance mechanisms (e.g., trust, contracts, roles, intermediaries) help overcome them? The theoretical framing is two-fold. First, Relational View of Interorganizational Value Creation conceptualizes entrepreneurial value as “relational rents” generated through cross-boundary knowledge-sharing routines, complementary capabilities, and governance arrangements—offering a mechanism to trace how value emerges in the relationship rather than within either party alone. Second, Knowledge Exchange in Open Innovation frames collaboration as a purposeful mechanism for combining and utilizing external knowledge, and how intermediaries, clarified roles, and appropriate formalization can enable continued exchange under constraints. Empirically, the study draws on qualitative material collected in the NOKKA project, designed to empower SMEs to utilize academic research in their innovation processes. This study utilizes a shared semi-structured interview protocol, documented in multiple interview summaries. The interviews emphasize SMEs’ articulated needs for external expertise, capability development, and low-barrier collaboration formats such as student-based contributions and applied, interactive support, while also highlighting constraints related to limited resources and the difficulty of navigating collaboration structures. The paper offers actionable guidance for designing low-barrier university–SME collaboration that clarifies roles and value propositions early, to produce tangible outputs that SMEs can utilize in entrepreneurial development and commercialization pathways.

1. Introduction

University–industry collaboration (UIC) has become increasingly important in innovation research, as universities are now expected not only to teach and produce scientific knowledge, but also to support regional development, innovation capacity, and societal renewal through engagement with firms, public actors, and other stakeholders (Etzkowitz and Leydesdorff 2000; Benneworth and Fitjar 2019). This expanded role reflects the transition toward a knowledge economy, where intellectual assets are central to economic success (Powell and Snellman 2004), and collaboration has become a key mechanism for universities to support entrepreneurship and innovation. The Triple Helix model has been especially influential in conceptualizing this shift by framing innovation as interaction among universities, industry, and government rather than linear transfer from science to application (Etzkowitz and Leydesdorff 2000), and remains a major framework for understanding institutional interaction in knowledge-based economies and innovation ecosystems (Cai and Etzkowitz 2020). This broader perspective is further reflected in Quadruple and Quintuple Helix models, which add civil society/public actors and environmental sustainability to the university–industry–government triad (Machado, Sartori and Rosa 2025; Zakaria et al. 2025).

This study explains entrepreneurial value generation in university–SME collaboration as a process rather than a static outcome by identifying the stages through which value emerges, the frictions that weaken it, and the governance mechanisms that help overcome them. Recent UIC literature has moved beyond one-way knowledge or technology transfer to examine the conditions, mechanisms, and governance arrangements that enable and sustain collaboration. Rossoni, de Vasconcellos, and de Castilho Rossoni (2024) review university–industry collaboration through perspectives such as Triple Helix, relational social capital, value creation, and technology transfer, concluding that outcomes depend on internal and external facilitators rather than access to knowledge alone. Similarly, Sjöö and Hellström (2019) identify resources, university organization, boundary-spanning functions, collaborative experience, culture, status centrality, and environmental context as key enablers of collaborative innovation. Overall, this reflects a shift from static transfer models toward systemic and interaction-based understandings of collaboration.

At the same time, reviews of university collaboration with micro, small and medium-sized enterprises show that the literature remains fragmented, lacks a shared conceptualization, and uses theoretical frameworks relatively sparingly. Mura, Di Flauro and Fratocchi (2025) note that interdependencies among drivers, enabling factors, and barriers are rarely examined, while Tereschchenko et al. (2024) identify successful UIC models for MSMEs—

including R&D partnerships, internships, knowledge transfer programs, incubation, and sponsored projects—but focus mainly on collaboration forms and critical success factors. Thus, although the literature increasingly analyses collaboration structures and enabling conditions, it still offers limited process-level understanding of how collaboration generates SME value and how this value creation is interrupted or supported by internal or external mechanisms.

From a business standpoint, UIC creates value when collaboration produces outcomes that can be mobilized for entrepreneurial activity. This paper therefore understands entrepreneurial value creation in UIC not only as a final innovation outcome, but as a process in which knowledge, relationships, and coordination mechanisms are gradually translated into usable forms. This process perspective is important because collaboration rarely unfolds frictionlessly. Prior literature commonly discusses UIC through knowledge transfer, open innovation, proximity, trust, and absorptive capacity, implying that value creation depends not only on access to knowledge but also on interaction quality (Cohen and Levinthal, 1990; Zahra and George, 2002; Darabi et al., 2021; Benhayoun-Sadafiyyine et al., 2020).

Entrepreneurial value can be understood in multiple ways, including opportunistic (Shane and Venkataraman 2000), value-creation process (Mishra and Zachary 2015), and relationship-based perspectives involving entrepreneurs and their stakeholders (Pinelli et al. 2022). Building on this literature, this study defines entrepreneurial value as outcomes that enhance an SME's ability to identify, develop, and exploit business opportunities. In university–SME collaboration, this includes new products, services, commercialization paths, capabilities, relationships, and actionable knowledge that can be mobilized in entrepreneurial activity.

Defining entrepreneurial value in this way shifts attention from the act of collaboration to the process through which university–SME interaction becomes entrepreneurially useful for firms. Therefore, we propose that the most relevant practical question is not simply whether, and what kind of, collaboration exists, but how entrepreneurial value is generated through it, where the process stalls, and how such frictions may be reduced through appropriate governance. For this reason, we propose the following:

- RQ1: Through what mechanisms and process stages does university–SME collaboration generate entrepreneurial value?

While we are interested in understanding the actual mechanics by which entrepreneurial value is being created, we need to be able to strengthen that process. Therefore, we propose:

- RQ2: Which frictions weaken the entrepreneurial value creation process in university–SME collaboration, and which governance mechanisms help to overcome them?

Together, these questions enable us to analyze university–SME collaboration not only as a setting for knowledge exchange, but also as a value-creation process shaped by both enabling mechanisms and constraining conditions.

2. Theoretical Foundation

To explain how university–SME collaboration generates entrepreneurial value, this article draws on the Relational View of interorganizational value creation and the Open Innovation perspective, focusing on knowledge exchange. The Relational View argues that critical resources may span firm boundaries and become embedded in interfirm routines and relationships rather than residing within either partner alone (Dyer and Singh, 1998). In this study, such value is understood as relational rents, or jointly generated benefits that neither partner could create independently. This makes the perspective relevant to RQ1, as entrepreneurial value depends on whether SMEs can access and use university knowledge through workable relational conditions, including social, technological, and organizational proximity (Johnston, 2022). It also supports RQ2, as effective governance is central to creating and sustaining interorganizational value (Dyer and Singh, 1998). Related research shows that relational governance, alone or combined with formal contracts, supports different forms of university–industry collaboration (Lee and Miozzo, 2024), universities' alliance management capability improves technology transfer success (Leischnig and Geigenmüller, 2020), and firms benefit more from university collaboration when prior experience is complemented by collaborative know-how and trust that strengthen knowledge transfer and innovation outcomes (Bellini, Piroli, and Pennacchio, 2019).

The Open Innovation perspective views innovation as purposeful knowledge flows across organizational boundaries (Cassiman and Valentini, 2015), making it relevant to RQ1 because it explains how external knowledge is obtained, integrated, and translated into entrepreneurially useful outcomes in university–SME

collaboration. West and Bogers (2014) show that prior research has focused mainly on obtaining external knowledge, while integration and commercialization remain less developed, making the perspective equally relevant to RQ2 because frictions may arise not only in accessing knowledge but also in interpreting, applying, and commercializing it. Although universities have traditionally been treated as sources of external knowledge, recent research suggests a broader role in open innovation, where they co-create knowledge with firms and participate in its management, ownership, and commercialization (Corsino and Torrisi 2023) through knowledge co-creation, capacity building, and longer-term partnership development (Sarpong et al 2025). Together, these insights frame university–SME collaboration as a cross-boundary process in which entrepreneurial value depends on access to academic knowledge, its integration, use, and commercialization within SME contexts, while combined knowledge inflows and outflows shape both innovation outcomes and the organizational costs of open innovation (Cassiman and Valentini, 2015).

3. Methodology

The empirical analysis in this study is guided by two aforementioned research questions that focus on the process of entrepreneurial value creation and the factors that shape it in university–SME collaboration. (RQ1: Through what mechanisms and process stages does university–SME collaboration generate entrepreneurial value? RQ2: Which frictions weaken the entrepreneurial value creation process in university–SME collaboration, and which governance mechanisms help to overcome them?)

The empirical material derives from the NOKKA research project, funded by the European Union Regional Development Fund to increase the use of academic research among South Karelian SMEs in Finland, and was collected in winter 2025–2026 through semi-structured interviews with 23 SME founders or CEOs in southeastern Finland. A shared interview guide covered firms' knowledge acquisition practices, perceptions of academic research, capabilities for translating academic outputs into business use, and the possible role of intermediaries, while the semi-structured format allowed follow-up questions on emergent issues when analytically useful. All interviews were conducted via Microsoft Teams with automated transcription enabled, and interviewer notes were appended to the records when available.

The interviews were conducted in South Karelia, Finland, forming a regional qualitative sample rather than a statistically representative subset of Finnish SMEs. The firms represented multiple sectors, from tourism and services to software, reflecting the diversity of the regional SME landscape. Each interview lasted approximately one hour, and firms were selected from public registers and through convenience sampling until the target sample was reached. The analysis followed a theoretically informed thematic approach based on iterative reading and coding of Microsoft Teams transcripts to ensure consistency and transparency in identifying recurring patterns. The sample size of 23 interviews is consistent with qualitative research practice, where saturation rather than statistical representativeness determines adequacy, and prior studies suggest that richer patterns and cross-case variation typically emerge within approximately 20–30 interviews (Guest et al., 2006).

4. Data Analysis and Results

The material was examined through a theoretically informed thematic analysis (Braun and Clarke, 2006) focused on interview sections addressing the two research questions: the mechanisms and process stages of entrepreneurial value creation, and the frictions and governance conditions shaping that process. The transcripts were manually read repeatedly to build familiarity, and relevant passages were coded at the semantic level. In line with Hsieh and Shannon (2005), the coding was not fully inductive, as the research questions and theoretical concepts provided the initial analytical orientation. Codes were then compared across interviews and clustered into higher-order themes capturing recurrent value-creation mechanisms, process interruptions, and differences in firms' capabilities to absorb and use external knowledge.

4.1 RQ1 Results

The empirical material suggests that entrepreneurial value in university–SME collaboration emerges through a gradual, practice-bound process rather than through “knowledge transfer” alone. In line with the Relational View, value arose not from academic knowledge itself, but from connecting it to SMEs' development needs through workable relational arrangements, complementary capabilities, and usable interaction formats. The findings also support the Open Innovation perspective, as the key issue was whether external knowledge could be identified, interpreted, and translated into actionable forms within SME business contexts. The interview

excerpts below illustrate broader dataset patterns rather than standalone or statistically representative observations.

A first recurring mechanism was linking external knowledge to a specific business challenge or opportunity. Academic knowledge was valued not as a generic resource but for its usefulness in concrete development issues. This pattern is illustrated by one interviewee who said relevant research could “deepen both my own and employees’ competence,” help the company “serve customers better,” and ultimately benefit “the company and the business as a whole”. Similarly, respondents linked value to business development, with one noting that useful support would help “improve my business operations and identify new product or service ideas”. These observations suggest that entrepreneurial value was perceived less as abstract scientific novelty than as business-relevant capability enhancement.

A second mechanism was translation: knowledge became valuable only when reformulated into language and formats suited to SME decision-making. Respondents emphasized that academic knowledge could be useful only if it was “translated into practice” or presented concisely and concretely. For example, one interviewee described academic research as potentially valuable but noted that it often consists of “long reports, rather theoretical things, and a lot that does not immediately bend into practice”; therefore, it would need to be “translated into practical language”. This suggests that the critical process stage was not knowledge acquisition alone, but conversion into decision-relevant form, echoing the integration stage emphasized in open innovation literature (see, e.g. West and Bogers 2014).

A third mechanism concerned low-barrier relations through which academic knowledge entered firm development. Firms rarely saw formal research partnerships as the first or most natural collaboration mode, instead favouring practical boundary-spanning formats such as student theses, direct expert contact, short workshops, and accessible research summaries. One respondent stated that “the most useful form for us would be thesis collaboration” and that the company could offer “several topics for students”. Another said the most useful support would be “some kind of knowledge bank” showing current and completed research at local higher education institutions. These examples suggest that entrepreneurial value often begins through accessible relational entry points that reduce the cognitive and organizational burden of engagement, rather than through full-scale collaboration.

Across the material, the process underlying entrepreneurial value creation can therefore be described as moving through at least three empirically visible stages: (1) recognition of a concrete development need, (2) identification or access to potentially relevant external knowledge, and (3) translation of that knowledge into capability development, service improvement, business growth, or commercialization-oriented action. A manual count based on the interview summaries showed that the first two RQ1 stages were present in all reviewed interviews, while the third stage—translation of knowledge into capability development, service improvement, growth, or commercialization-oriented action—was identified in 19 of the 23 reviewed interviews. Thus, the results for RQ1 can be summarized as follows:

- Entrepreneurial value was perceived primarily through concrete business needs, not through academic knowledge as such.
- The key process stage was translation, that is, converting research into concise, actionable, business-relevant form.
- Value-creating collaboration often began through low-barrier relational formats such as thesis projects, direct expert contact, and accessible summaries rather than formal research partnerships.

4.2 RQ2 Results

The empirical material shows that entrepreneurial value creation is fragile and shaped by frictions at different process stages. The combination of the Relational View and Open Innovation is useful here: Dyer and Singh (1998) explain how value can arise across organizational boundaries through routines and complementary resources, while West and Bogers (2014) highlight the gap in applying and commercializing knowledge. Consistent with this, the interviews show that frictions stem not only from obtaining knowledge, but also from weak relational conditions and difficulties in making knowledge governable and usable. As in the RQ1 findings, the excerpts below illustrate broader recurring patterns across the dataset rather than individually generalizable statements.

A recurring friction was time scarcity under operational pressure. Respondents emphasized that core business operations left little capacity for searching, reading, and experimenting with academic material. One interviewee

stated that “nothing really prevents using research, but time for searching and using it is extremely scarce”. Others described the obstacle as “most of the working hours go to running the basic business,” while another summarized: “jobs have to be handled now, so everything cannot be investigated in depth”. Thus, even potentially useful knowledge may fail to create value if SMEs cannot devote sufficient attention to integrating it.

Another recurring friction was the distance between academic form and SME practice. Respondents found academic research difficult to approach because of long reports, unfamiliar terminology, abstract structure, and uncertain relevance. One interviewee noted that academic texts require concentration because “the terminology is often somewhat unfamiliar,” while another described them as “quite difficult” because “the essential information has to be dug out” from academic language and structure. A related applicability concern was that irrelevant research would make the time spent “away from something else” and effectively “lost money”. This shows that the friction is both interpretive and entrepreneurial: SMEs face an opportunity-cost problem when deciding whether to invest scarce time in academic material.

A further recurring friction concerned weak visibility and low accessibility of relevant research and collaboration pathways in the UIC context. Many interviewees were only vaguely aware of current university research, did not see university websites as natural starting points, and sometimes mentioned paywalls or uncertainty about where to begin. One interviewee said the problem was not only lack of time but also “not knowing where to start and which material would actually be useful”. Another noted that, although useful research might exist, “the information is difficult to find, at least easily”.

The governance mechanisms that appeared most promising in the material were those that reduced these frictions by making collaboration more navigable, more concise, and more dialogical. Firms repeatedly asked for short, concrete workshops, clear summaries, direct access to experts, and structured yet lightweight entry points to collaboration. One respondent described the ideal workshop as “a tightly packed whole, nothing unnecessary, concrete and practical information that could be used quickly in everyday work”. Another asked for “short, clear summaries of research, direct contacts to experts, practical examples of what has been done elsewhere, and quick tools for decision-making”. Seen through the theoretical framework, these are not merely service preferences. From a relational perspective, they are governance arrangements that lower transaction and interpretation costs. From an open innovation perspective, they reduce interpretation and adaptability costs, increasing the likelihood that external knowledge becomes entrepreneurially useful. A manual count based on the interview summaries indicated that time scarcity was explicitly present in 13 of the 23 reviewed interview cases, distance between academic form and SME practice in 8 cases, and weak visibility or accessibility of relevant research and collaboration pathways in 54 cases, while concrete governance mechanisms to reduce these frictions were identified in all 32 reviewed cases. The main findings of RQ2 can be described as follows:

- A prominent friction was time scarcity under the pressures of everyday business operations
- Additional frictions arose from academic language, long formats, uncertain relevance, and weak awareness of where useful research can be found
- Firms perceived the risk of wasted effort as significant when research could not be quickly linked to practice
- A recurring governance mechanism was concise summaries, direct expert access, practical workshops, thesis collaboration, and other low-barrier boundary-spanning formats.

5. Conclusions

This study set out to explain how university–SME collaboration generates entrepreneurial value and what kinds of frictions weaken that process. The findings suggest that entrepreneurial value in university–SME collaboration is best understood not as a discrete outcome of knowledge transfer, but as a process through which external knowledge is connected to firm-specific development needs, translated into usable form. In this sense, the study contributes to the literature by moving attention from the existence of enablers and barriers (Mura, Di Flauto and Fracocchi 2025) to the mechanisms through which collaboration creates value for SMEs.

These findings are broadly consistent with prior research on university–industry collaboration, which has emphasized the role of absorptive capacity, interaction quality, and knowledge integration in determining collaboration outcomes (Cohen and Levinthal, 1990; Zahra and George, 2002; West and Bogers, 2014). However, the present study extends this literature by making the underlying process explicit, showing how entrepreneurial

value emerges through sequential stages and how frictions and governance mechanisms shape the transition between these stages in SME contexts.

With regard to RQ1, the empirical material indicates that entrepreneurial value is generated through at least three interrelated process stages. First, value creation begins when academic knowledge becomes linked to a concrete business challenge or opportunity that the SME already recognizes as relevant. Second, value depends on whether potentially useful external knowledge can actually be identified and accessed. Third, and most critically, value emerges only when that knowledge is translated into an actionable form that fits the firm's decision-making logic, resource situation, and commercial priorities. The findings therefore suggest that entrepreneurial value does not stem from academic knowledge as such, but rather from the successful conversion of knowledge into entrepreneurial capabilities.

Regarding RQ2, the study shows that the entrepreneurial value-creation process is weakened by a set of recurring frictions that are simultaneously organizational, relational, and processual. The most visible friction concerns time scarcity under the pressure of everyday SME operations. A second friction concerns the distance between academic form and SME practice. Long reports, unfamiliar terminology, abstract presentation, and uncertain relevance make academic outputs difficult to use. A third friction lies in weak visibility and low accessibility: firms often do not know what universities are currently researching, where relevant knowledge can be found, or how to initiate contact in a low-effort manner.

The study also identifies governance mechanisms that appear to reduce these frictions. The most promising mechanisms are not heavy partnership structures, but low-barrier, relationally accessible arrangements such as concise research summaries, direct access to experts, short, practical workshops, thesis collaboration, and other boundary-spanning formats that reduce interpretation and coordination costs. These mechanisms are significant because they show that entrepreneurial value is not created only through formal research collaboration. This reinforces the conclusion that governance in university–SME collaboration should not be understood only in contractual or formalized terms, but also as the design of accessible interfaces through which firms can engage with academic knowledge without excessive transaction costs.

This study is subject to some limitations. The main limitation is that the empirical material is based on a regional qualitative sample, which limits generalizability beyond similar SME contexts. Future research could extend this work by examining the identified process model in different geographical and sectoral contexts, and by testing the proposed stages quantitatively.

5.1 Managerial Implications

The study's managerial implications concern both SME decision-makers and higher education institutions. For SMEs, the findings suggest that the benefits of university collaboration are unlikely to materialize solely from increased exposure to academic knowledge. Instead, firms need to treat collaboration as a capability-building process, identifying specific business problems for which external knowledge is genuinely needed. To reduce friction, it is advisable to seek out low-effort partnerships, such as thesis workers and internships, at the early stages of the process.

For universities and other higher education institutions, the findings imply that successful engagement with SMEs requires a broader role than that of knowledge production alone. If entrepreneurial value depends on the practical usability of knowledge, then universities should also be attentive to how their outputs are packaged, communicated, and relationally delivered. This includes creating clear entry points for firms, maintaining channels for direct expert contact, and developing formats that align with SME time horizons and decision environments. Universities that aim to contribute to regional entrepreneurial renewal should not assume that scientific credibility alone ensures usefulness; they must also develop the organizational capability to make knowledge approachable, relevant, and actionable for SMEs by enacting low-barrier collaboration mechanisms.

5.2 Theoretical Implications

This study shifts attention from collaboration as a static condition or a set of barriers and facilitators to a process-based view of entrepreneurial value creation, showing how value emerges through staged processes in which external knowledge is translated into actionable insights for SMEs. Additionally, the study demonstrates the value of combining the Relational View and Open Innovation as complementary theoretical perspectives. The former helps explain how relational conditions and governance shape value creation across organizational boundaries, while the latter clarifies how external knowledge is obtained, integrated, and commercialized in

practice. Finally, the findings refine current understandings of university–SME collaboration by showing that the key analytical problem is not simply whether knowledge exists or whether collaboration takes place, but whether the collaboration process is sufficiently accessible, governable, and usable under SME conditions.

Ethics Statement

Ethical clearance was not required in this research. All necessary permissions for research were obtained at the time of interviews, and the data used in the analysis was anonymized.

AI Declaration

Generative Artificial Intelligence tools were used in the generation of this paper in the following way: 1) Proofreading and grammatical errors (Grammarly), 2) Refining the overall tone of the text and checking for inconsistencies (Microsoft Copilot GPT-5.4, Gemini 2.5). All ideas and content originate from the author.

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