

The Impact of Institutional Support, Lecturer Capabilities, and Product Development on the Commercialization of Health Research

*Drivers of Health
Research
Commercialization*

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ABSTRACT

The commercialization of university research in the health sector is a strategic pathway for transforming academic knowledge into societal and economic value. Universitas Padjadjaran has generated numerous health-related innovations, yet its progression toward full downstream application and market entry remains uneven. This study examines the influence of institutional support, lecturer capability, and product development readiness on the success of research commercialization among academics in the health cluster. A qualitative design combining surveys and interviews was conducted from September to October 2025, involving 114 respondents selected purposively from 282 lecturers with research-based products. The findings show that commercialization success is strongly shaped by four key factors: sustained institutional support and incentive policies, collaborative networks with industry and government, lecturers' competencies in innovation management, and research effectiveness aligned with market and regulatory requirements. These results highlight the importance of strengthening institutional ecosystems to support research downstreaming and provide practical guidance for policymakers and university leaders in fostering sustainable academic entrepreneurship in Indonesia.

Keywords: *Downstream Innovation, Health Research, Institutional Support, Product Development, Research-Based, Research Commercialization.*

INTRODUCTION

Universities are increasingly expected to contribute not only to knowledge production but also to socio-economic development through the commercialization of research outputs (Compagnucci & Spigarelli, 2020; Cai & Ahmad, 2023). In the global knowledge economy, research commercialization has become a strategic mechanism linking academic research with innovation systems, industrial competitiveness, and public value creation (Caufield & Ogbogu, 2015; Dadipoor et al., 2019; Rossoni et al., 2024). This shift has repositioned universities as active actors within innovation ecosystems, interacting closely with government and industry through dynamic knowledge exchange processes (Forliano et al., 2021).

Health research occupies a particularly critical position within this transformation. Health-related innovations are directly associated with public welfare and regulatory oversight, while simultaneously requiring substantial financial investment and long development cycles (Fryatt & Blecher, 2023). Despite increased public funding for biomedical and health sciences, a large proportion of university-based health research fails to progress beyond laboratory or pilot stages, a challenge commonly described as the "valley of death" in innovation literature (Pujotomo et al., 2025). This problem is

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especially evident in developing countries, where institutional capacity and market absorption remain uneven (Adabre et al., 2022).

Previous studies, Ratinho et al. (2020) and O'Dwyer et al. (2023), consistently identify institutional support as a key determinant of research commercialization success in higher education. Institutional support encompasses policy frameworks, sustainable funding schemes, intellectual property management, technology transfer offices, and incentive systems that encourage academics to engage in entrepreneurial activities. Universities with integrated governance structures and coherent commercialization strategies demonstrate higher rates of licensing and spin-off formation, whereas fragmented institutional arrangements and administrative complexity often discourage researchers from pursuing downstream innovation (Audretsch & Belitski, 2022).

Beyond institutional arrangements, lecturer capability plays a crucial role in shaping commercialization outcomes. Academic capability in this context extends beyond scientific expertise to include entrepreneurial orientation, market awareness, networking competence, and the ability to collaborate with non-academic stakeholders (Perkmann et al., 2021; Altynbassov, 2025). Researchers who possess strong absorptive capacity and boundary-spanning skills are more likely to align their innovations with market needs and industry expectations. However, heavy teaching loads, administrative burdens, and limited exposure to industrial practices frequently constrain academics' engagement in commercialization activities (Woelert, 2023). Product development readiness represents another critical link between research and market entry. High-quality scientific outputs may fail to generate impact if product development processes do not adequately integrate regulatory compliance, technical feasibility, and market validation. In the health sector, these challenges are amplified by strict quality standards, clinical validation requirements, and ethical considerations, all of which increase development costs and time-to-market. Effective commercialization, therefore, requires early integration of market considerations, interdisciplinary collaboration, and sustained institutional support.

In Indonesia, research downstreaming has been promoted through national innovation policies and university reform initiatives. As a public university with legal entity status, Universitas Padjadjaran has generated a substantial number of research-based innovations, particularly in the health cluster. Nevertheless, only a limited proportion of these innovations have successfully reached the commercialization stage, indicating persistent structural and capability-related constraints. Despite extensive literature on technology transfer and entrepreneurial universities, empirical studies that simultaneously examine institutional support, lecturer capability, and product development within an integrated framework remain limited, particularly in the context of health research commercialization in developing countries. Addressing this gap, the present study investigates how these three factors influence the commercialization of health research outcomes at Universitas Padjadjaran.

LITERATURE REVIEW

Institutional Support and Research Commercialization

Recent literature emphasizes that institutional support is a foundational determinant of successful research commercialization in higher education. Institutional support refers to the availability of coherent policies, funding continuity, intellectual property management, technology transfer infrastructure, and incentive systems that collectively enable academics to engage in downstream innovation activities (Granstrand & Holgersson, 2020; Perkmann et al., 2021). Universities with integrated governance structures and dedicated commercialization units demonstrate higher rates of licensing, spin-off creation, and industry collaboration (Tseng et al., 2020). Conversely, fragmented administrative systems and ambiguous revenue-sharing mechanisms have been shown to discourage academic engagement in commercialization, particularly in research-intensive environments (Sohail et al., 2023).

In the context of developing countries, institutional support plays an even more critical role due to limited industrial absorption capacity and higher regulatory barriers (Falihat

et al., 2020). Studies indicate that universities lacking clear commercialization roadmaps and sustained funding mechanisms tend to experience stalled innovation pipelines, despite strong research output (Nugent et al., 2022). These findings suggest that institutional design is not merely a facilitating factor, but a structural prerequisite for effective research downstreaming.

Lecturer Capability and Academic Entrepreneurship

Lecturer capability has emerged as a central factor in explaining differences in research commercialization performance across universities. It is increasingly recognized that the ability of academics to translate research outputs into commercial value depends not only on their scientific expertise but also on a broader set of skills and orientations. Beyond technical knowledge, lecturer capability includes entrepreneurial orientation, absorptive capacity, networking competence, and the ability to collaborate with industry and policy actors (Huggins et al., 2020). Entrepreneurial orientation enables lecturers to identify market opportunities, take calculated risks, and pursue innovative applications of their research, while absorptive capacity allows them to recognize, assimilate, and apply valuable external knowledge effectively. Networking competence and boundary-spanning skills further allow lecturers to connect with industry partners, policymakers, and other stakeholders, facilitating collaborations, joint projects, and knowledge transfer that translate research into market-relevant innovations. This perspective highlights that effective research commercialization is not merely a function of scientific ability but also relies on strategic, relational, and entrepreneurial competencies that enable academics to navigate complex non-academic environments.

Despite the recognized importance of these capabilities, recent studies highlight persistent gaps among university researchers, particularly in market analysis, regulatory understanding, and business development (Cai & Lattu, 2022). High teaching loads, administrative responsibilities, and limited exposure to industrial practices further constrain lecturers' ability to engage in entrepreneurial activities (Borah et al., 2023). Institutional cultures and reward systems that prioritize publications over commercialization efforts may also limit entrepreneurial engagement, reducing the practical impact of research. Consequently, lecturer capability is increasingly understood as the interaction between individual skills and institutional environments that either enable or restrict entrepreneurial behavior. Enhancing this capability requires targeted strategies, including entrepreneurship training, structured industry collaborations, mentorship programs, and policies that incentivize knowledge transfer. By developing these competencies, universities can empower lecturers to translate research into innovations, increase commercialization success, and contribute to broader economic and societal benefits.

Product Development Readiness in Health Research

Product development readiness represents a critical intermediary stage between research discovery and commercialization, serving as the bridge that transforms scientific insights into tangible, market-ready innovations. Contemporary innovation studies emphasize that successful commercialization depends not only on the novelty or technical excellence of the research itself but also on the systematic alignment of product development processes with regulatory requirements, user needs, production feasibility, and market dynamics (Siwec et al., 2025). In sectors such as healthcare, these challenges are particularly pronounced due to stringent quality standards, clinical validation procedures, and ethical considerations, all of which contribute to increased development costs, extended timelines, and heightened risks. As a result, readiness for product development requires careful planning, structured project management, and ongoing evaluation of technical, regulatory, and commercial feasibility throughout the research lifecycle.

Recent empirical evidence highlights that early integration of market considerations, interdisciplinary collaboration, and sustained institutional support substantially improve

commercialization outcomes in health-related research (Tseng et al., 2020; Nugent et al., 2022). Research teams that engage with end-users, industry partners, and regulatory bodies from the outset are more likely to identify practical constraints and opportunities, adapt their designs, and reduce the time-to-market for innovations. Conversely, projects that focus solely on scientific output without embedding product development strategies often struggle to generate tangible downstream impact, limiting the translational potential of research. These findings underscore the need to view product development readiness not as a post-research activity, but as an integral and continuous component of the innovation process within universities, ensuring that scientific discoveries are effectively converted into commercially viable and socially impactful solutions.

RESEARCH METHODS

This study adopts a qualitative design with an exploratory emphasis, positioned within a sequential explanatory framework. The qualitative phase is prioritized to capture in-depth insights into institutional, individual, and product-related factors influencing the commercialization of health research, with the analysis focusing on qualitative evidence. This design is appropriate for examining complex organizational phenomena where contextual understanding is required before statistical generalization (Dawadi et al., 2021; Lundberg et al., 2020).

Figure 1 presents the conceptual framework of this study, which positions institutional support, lecturer capability, and product development as key factors influencing the commercialization of health research outcomes. Institutional support reflects the role of organizational policies, funding mechanisms, and commercialization infrastructure. Lecturer capability represents the individual capacity of academics to engage in innovation and entrepreneurial activities, while product development captures the readiness of research outputs to meet regulatory and market requirements.

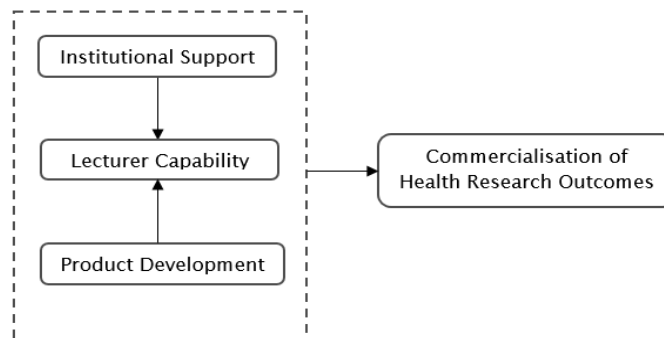


Figure 1. Conceptual Framework of the Study

The study was conducted at Universitas Padjadjaran, a public university with legal entity status and a strategic mandate to promote research downstreaming. The research focuses on the health cluster, which represents the largest share of research-based innovations at Unpad. The study population comprises 282 holders of research-based products, from which 114 academics within the health cluster were identified as the target domain. For the qualitative phase, purposive sampling was employed to select informants with direct experience in developing and attempting to commercialize health-related research outputs, ensuring information-rich cases relevant to the research objectives (Ahmad & Wilkins, 2025).

Primary qualitative data were collected through semi-structured interviews with five academic innovators representing different faculties and stages of commercialization. The interviews explored experiences related to institutional support, lecturer capability, product development processes, industry collaboration, regulatory challenges, and market readiness. Interviews were conducted using a flexible interview guide, allowing informants to elaborate on critical issues encountered during the commercialization process.

Qualitative data were analyzed using thematic analysis, following a systematic process of data familiarization, initial coding, theme development, and cross-case synthesis (Braun & Clarke, 2021). Coding was conducted iteratively to identify recurring patterns across informants, with particular attention to convergence and divergence of experiences. To enhance analytical rigor, themes were continuously compared across cases and aligned with the conceptual framework derived from the literature.

To ensure the trustworthiness of qualitative findings, this study applies credibility and dependability strategies, including careful informant selection, systematic coding procedures, and transparent documentation of analytical steps (Adeoye-Olatunde & Olenik, 2021). Ethical clearance for the study was obtained from the Research Ethics Committee of Universitas Padjadjaran, and all participants provided informed consent prior to data collection. Informant identities were anonymized to protect confidentiality and encourage candid responses.

RESULTS

This study draws on qualitative data obtained from five semi-structured interviews with academic innovators in the health cluster at Universitas Padjadjaran. Using thematic analysis, the findings reveal a set of recurring patterns that shape the commercialization of health research outcomes. Across cases, informants consistently described structural constraints related to institutional support, limited entrepreneurial capability, challenges in product development readiness, and weak industry linkage. Although the informants represented different faculties and types of innovation, their experiences converged around similar bottlenecks within the research commercialization ecosystem. Table 1 presents the profile of informants and their innovations.

Table 1. Profile of Interview Informants and Characteristics of Health Research Innovations

Informant Code	Faculty / Cluster	Type of Innovation	Stage of Commercialization	Industry/External Partnership
R1	Health Cluster	Diagnostic kit	Prototype – limited testing	None
R2	Health Cluster	Nutraceutical/functional food	Pilot production	Informal industry contact
R3	Health Cluster	Biomedical product	Prototype – regulatory preparation	Industrial partnership (early stage)
R4	Health Cluster	Medical equipment/footwear	Prototype – market trial	None
R5	Health Cluster	Bio-based health product	Early market introduction	Industry & community partners

Notes: Names, faculty details, and partner institutions are anonymized to maintain the confidentiality of informants.

Informants consistently highlighted institutional support as a decisive factor influencing their ability to commercialize research outcomes. While the university provides formal mechanisms such as research grants, intellectual property services, and policy frameworks, these supports were often perceived as fragmented and insufficient to sustain downstream innovation. Several informants emphasized that research funding tends to prioritize academic outputs, particularly publications, rather than supporting product scaling, regulatory readiness, or market entry. This means that institutional support is a foundational prerequisite for successful commercialization in higher education (Granstrand & Holgersson, 2020; Perkmann et al., 2021). Moreover, administrative complexity and the absence of clear commercialization roadmaps further constrained progress, creating uncertainty regarding procedures for industry collaboration, revenue-sharing mechanisms, and institutional commitment beyond the research phase. Such ambiguity reflects prior studies showing that fragmented governance structures and unclear pathways can discourage academic engagement in commercialization, especially in research-intensive environments (Sohail et al., 2023).

Beyond institutional factors, lecturer capability emerged as a critical determinant of commercialization outcomes. Informants acknowledged strong scientific competence but reported limited capacity in areas such as market analysis, business development, and negotiation with industry partners. Many described themselves as “research-oriented” rather than “market-oriented,” indicating a gap between academic expertise and the entrepreneurial skills required for translating research into marketable products. This means that lecturer capability extends beyond scientific knowledge to include entrepreneurial orientation, networking competence, and the ability to engage with non-academic actors (Huggins et al., 2020; Abdilah et al., 2025). Several informants also noted limited familiarity with regulatory and commercial processes, reflecting persistent capability gaps identified in recent research on academic entrepreneurship.

In addition, heavy teaching loads and administrative responsibilities were repeatedly mentioned as major constraints that reduced the time and energy available for downstream innovation activities (Kim, 2019). Informants viewed workload pressures as a structural barrier, making it difficult to sustain commercialization efforts alongside core academic duties. High teaching and institutional obligations often restrict academics’ capacity to participate in entrepreneurial activities and industry collaboration (Borah et al., 2023). As a result, even motivated researchers struggled to advance innovations beyond the laboratory without external support, intermediaries, or dedicated commercialization assistance.

Product development readiness was identified as a major bottleneck in the commercialization process. Informants reported persistent difficulties in transitioning from laboratory prototypes to scalable products that comply with regulatory and quality standards. In the context of health-related innovations, regulatory approval, quality assurance, and validation requirements were described as particularly demanding, often requiring substantial time, financial resources, and specialized expertise. This finding reflects broader innovation research emphasizing that commercialization success depends not only on scientific novelty but also on the alignment of product development with regulatory frameworks, user needs, and production feasibility (Siwec et al., 2025).

Several informants further noted that product development was frequently treated as a post-research activity rather than an integrated stage of the innovation process. As a result, scientific designs were sometimes misaligned with downstream requirements, delaying market readiness and reducing commercial viability. Early integration of market considerations and sustained institutional support is essential for strengthening commercialization outcomes, particularly in health-sector research where development pathways are complex and highly regulated (Tseng et al., 2020; Nugent et al., 2022).

Limited access to relevant industry partners emerged as a recurring theme across interviews. Informants emphasized that identifying suitable partners, negotiating collaboration terms, and sustaining partnerships required institutional mediation that was often absent. Without industry linkage, researchers relied on personal networks or informal contacts, which constrained scalability and market reach. Market access was further hindered by limited institutional support for branding, distribution, and promotion (Tseng et al., 2020). Informants expressed the need for a dedicated intermediary role to bridge academic research with industry and market actors.

Across cases, informants who progressed further toward commercialization tended to combine three enabling conditions: partial institutional support, external partnerships, and individual initiative in navigating market requirements. Conversely, innovations stalled at the prototype stage were typically characterized by weak institutional coordination, limited lecturer entrepreneurial capability, and a lack of industry linkage. These patterns suggest that research commercialization is shaped by the interaction of institutional, individual, and product-related factors rather than any single determinant. Table 2 shows the key themes and qualitative interviews.

Table 2. Key Themes and Illustrative Quotations from Qualitative Interviews

Theme	Subtheme	Summary of Findings	Illustrative Quotation
Institutional Support	Funding & policy	Research funding prioritizes academic outputs over downstream development	“Research funding is sufficient for publications, but not for taking products to the market.” (R2)
Institutional Support	Governance	Commercialization procedures are unclear and fragmented	“We are still confused about the exact pathway for collaboration with industry.” (R4)
Lecturer Capability	Entrepreneurial skills	Limited market and business knowledge among academics	“We are trained as researchers, not as entrepreneurs.” (R1)
Lecturer Capability	Workload	Teaching and administrative duties constrain innovation efforts	“Time is our biggest limitation.” (R3)
Product Development	Regulatory readiness	Regulatory and quality requirements delay market entry	“The regulatory process is long and expensive.” (R5)
Product Development	Scaling	Difficulty moving from prototype to mass production	“Scaling up is much harder than developing the prototype.” (R4)
Industry Linkage	Partnership access	Limited institutional brokerage for industry collaboration	“Finding the right partner depends on personal networks.” (R2)
Market Access	Distribution & promotion	Weak support for branding and market penetration	“We don’t know how to reach the market effectively.” (R1)

Figure 2 synthesizes these findings by illustrating bottlenecks along the commercialization pathway, from research output to market entry. The visual mapping underscores that constraints accumulate across stages, rather than occurring in isolation. Institutional limitations constrain funding and governance at early stages, capability gaps hinder market engagement, and regulatory barriers delay scaling, collectively reducing the likelihood of successful commercialization.

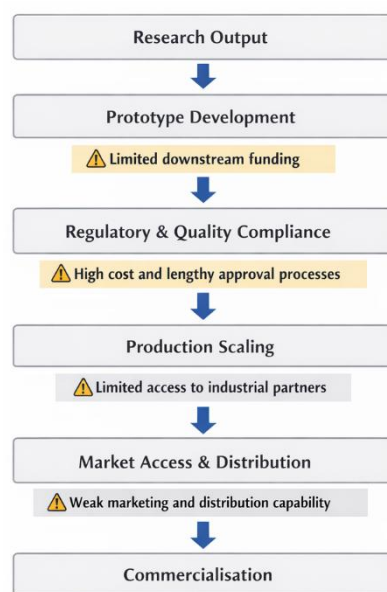


Figure 2. Bottlenecks in the Commercialization Pathway of Health Research Innovations

This integrated interpretation extends existing conceptual models by demonstrating how institutional, individual, and product-level factors interact dynamically across the innovation lifecycle. Rather than treating these factors as independent predictors, the findings suggest that commercialization outcomes are shaped by cumulative and

compounding bottlenecks. This insight contributes to recent scholarship calling for systems-oriented approaches to university innovation policy (Cottafava et al., 2022).

DISCUSSION

The findings indicate that institutional support plays a dual role as both an enabler and a constraint in the commercialization process. Informants consistently reported that while formal institutional mechanisms, such as research grants and intellectual property units, are present, they are often insufficient to support downstream activities such as regulatory compliance, product scaling, and market entry. This finding aligns with Perkmann et al. (2021) and Radko et al. (2023), showing that universities tend to prioritize academic outputs over commercial outcomes, resulting in an “upstream bias” in research funding allocation.

Similar patterns have been reported in studies of entrepreneurial universities in emerging economies, where fragmented governance structures and short-term funding schemes limit the sustainability of commercialization efforts (Granstrand & Holgersson, 2020). However, the present study extends prior research by demonstrating that these constraints are particularly acute in health research, where regulatory requirements and validation costs amplify the consequences of institutional gaps. Unlike universities in more mature innovation systems, where technology transfer offices function as effective intermediaries, informants in this study perceived institutional brokerage as limited and procedural rather than strategic. This divergence may reflect contextual differences in institutional maturity and policy implementation capacity.

The results underscore that a lecturer’s capability extends far beyond scientific competence. Informants described limited entrepreneurial skills, market awareness, and negotiation capacity as major barriers to commercialization. This finding corroborates recent evidence suggesting that academic entrepreneurship depends on boundary-spanning capabilities that enable researchers to translate scientific knowledge into market-relevant innovations (Cai & Lattu, 2022; Borah et al., 2023).

However, the findings also reveal a structural dimension that differentiates this study from research conducted in developed-country contexts. Studies in European and North American universities often emphasize individual entrepreneurial orientation as a key driver of commercialization (Mathopo et al., 2024). This study shows that lecturer capability is heavily shaped by institutional workload structures. High teaching loads and administrative responsibilities significantly constrained academics’ capacity to engage in downstream innovation, even when motivation was present (Schneckenberg, 2009). This suggests that capability gaps are not solely individual deficiencies but are embedded within organizational incentive systems, supporting arguments that entrepreneurial behavior in academia is co-produced by institutional environments (Siwec et al., 2025).

Product development readiness emerged as a critical bottleneck across all cases, reinforcing the centrality of this factor in health research commercialization. Informants reported difficulties in transitioning from prototype development to scalable, market-ready products due to regulatory requirements, quality assurance standards, and financial constraints. These findings are consistent with recent innovation studies highlighting regulatory complexity as a key barrier in health and biomedical innovation (Dawadi et al., 2021; Moghimi et al., 2024; Amaral et al., 2024).

What distinguishes the present study is the emphasis on timing and integration. Informants indicated that market and regulatory considerations were often addressed only after research completion, resulting in misalignment between scientific design and commercial feasibility. This finding supports recent calls for earlier integration of market and regulatory perspectives within the research lifecycle (Cooper, 2021). In contrast to linear models of innovation, the results suggest that health research commercialization requires iterative alignment between scientific, regulatory, and market domains, a process that remains weakly institutionalized in the studied context.

Weak industry linkage was identified as a recurring constraint, particularly in relation to production scaling and market access. Informants relied heavily on personal networks

to establish partnerships, reflecting the absence of institutional brokerage mechanisms. This finding aligns with recent studies showing that effective industry engagement requires active intermediary roles that translate academic outputs into industry-relevant value propositions (Huggins et al., 2020; Diaz et al., 2020).

However, the findings diverge from studies conducted in innovation-intensive regions, where universities increasingly act as proactive network orchestrators (Audretsch & Belitski, 2021). In the present context, industry engagement remained informal and opportunistic, limiting scalability and sustainability. This divergence highlights the importance of institutional boundary-spanning functions that go beyond formal agreements to include active partner matching, negotiation support, and post-collaboration facilitation.

CONCLUSION

This study examined the commercialization of health research outcomes at Universitas Padjadjaran by analyzing the interplay between institutional support, lecturer capability, and product development readiness. The findings show that commercialization is shaped by cumulative bottlenecks across the innovation pathway rather than isolated barriers. Although formal mechanisms such as grants and IP units exist, they remain insufficient to sustain downstream innovation, particularly in health research, where regulatory and market entry challenges are substantial.

The study confirms that institutional support is foundational but cannot operate effectively without corresponding lecturer capabilities and product development strategies. Lecturer capability extends beyond scientific excellence to include entrepreneurial orientation, market awareness, and boundary-spanning skills, yet these are often constrained by heavy workloads and limited incentives. Product development readiness also emerged as a decisive determinant, especially regarding regulatory compliance, scaling, and alignment with market requirements. Together, these dimensions highlight that successful commercialization requires a systemic approach addressing governance, capability development, and innovation processes simultaneously.

Several implications follow for higher education policy and university governance. Institutional support should extend beyond research funding to include regulatory assistance and sustained resources for market development. Lecturer capability building must be embedded within workload and incentive structures, while product development considerations should be integrated early in research design. Universities also need to strengthen their intermediary role by facilitating industry partnerships and market access. This study is limited by its qualitative scope within a single university and its focus on health research, which may reduce generalizability. Future research will quantitatively validate these relationships through surveys and regression or structural equation modelling, while comparative and longitudinal studies could further clarify systemic determinants of commercialization success.

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REFERENCES

- [1] Abdilah, L., M. Sidik Priadana, & Juniarti, A. T. (2025). Innovation capability as mediator between competence, emotional intelligence, support, and lecturer performance in Indonesia. *Jurnal Ilmiah Manajemen Kesatuan*, 13(5), 3385–3396.
- [2] Adabre, M. A., Chan, A. P. C., & Darko, A. (2022). Interactive effects of institutional, economic, social and environmental barriers on sustainable housing in a developing country. *Building and Environment*, 207(1), 108-120.
- [3] Adeoye-Olatunde, O. A., & Olenik, N. L. (2021). Research and scholarly methods: Semi-structured interviews. *Journal of the American College of Clinical Pharmacy*, 4(10), 1358–1367.
- [4] Ahmad, M., & Wilkins, S. (2025). Purposive sampling in qualitative research: A framework for the entire journey. *Quality & Quantity*, 59(2), 1461–1479.
- [5] Altynbassov, B. (2025). University–industry collaboration: Challenges, opportunities, and pathways to strengthen university governance and financial sustainability. *Industry and Higher Education*, 2(3), 14-25.
- [6] Amaral, C., Paiva, M., Rodrigues, A. R., Veiga, F., & Bell, V. (2024). Global regulatory challenges for medical devices: Impact on innovation and market access. *Applied Sciences*, 14(20), 9304-9314.
- [7] Audretsch, D. B., & Belitski, M. (2021a). Three-ring entrepreneurial university: In search of a new business model. *Studies in Higher Education*, 46(5), 977–987.
- [8] Audretsch, D. B., & Belitski, M. (2021b). Knowledge complexity and firm performance: Evidence from the European SMEs. *Journal of Knowledge Management*, 25(4), 693–713.
- [9] Audretsch, D. B., & Belitski, M. (2022). A strategic alignment framework for the entrepreneurial university. *Industry and Innovation*, 29(2), 285–309. Perkmann, M., Salandra, R., Tartari, V., McKelvey, M., & Hughes, A. (2021). Academic engagement: A review of the literature 2011–2019. *Research Policy*, 50(1), 104-180.
- [10] Borah, D., Massini, S., & Malik, K. (2023). Teaching benefits of multi-helix university–industry research collaborations: Towards a holistic framework. *Research Policy*, 52(8), 843-855.
- [11] Braun, V., & Clarke, V. (2021). One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qualitative Research in Psychology*, 18(3), 328–352.
- [12] Cai, Y., & Ahmad, I. (2023). From an entrepreneurial university to a sustainable entrepreneurial university: Conceptualization and evidence in the contexts of European university reforms. *Higher Education Policy*, 36(1), 20–52.
- [13] Cai, Y., & Lattu, A. (2022). Triple helix or quadruple helix: Which model of innovation to choose for empirical studies? *Minerva*, 60(1), 257–280.
- [14] Caulfield, T., & Ogbogu, U. (2015). The commercialization of university-based research: Balancing risks and benefits. *BMC medical ethics*, 16(1), 70-84.
- [15] Compagnucci, L., & Spigarelli, F. (2020). The third mission of the university: A systematic literature review on potentials and constraints. *Technological Forecasting and Social Change*, 161(1), 120-132.
- [16] Cooper, R. G. (2021). Accelerating innovation: Some lessons from the pandemic. *Journal of Product Innovation Management*, 38(2), 221–232.
- [17] Cottafava, D., Ascione, G. S., Corazza, L., & Dhir, A. (2022). Sustainable development goals research in higher education institutions: An interdisciplinarity assessment through an entropy-based indicator. *Journal of Business Research*, 151(1), 138–155.
- [18] Dadipoor, S., Ramezankhani, A., Aghamolaei, T., & Safari-Moradabadi, A. (2019). Barriers to research activities as perceived by medical university students: A cross-sectional study. *Avicenna journal of medicine*, 9(1), 8-14.
- [19] Dawadi, S., Shrestha, S., & Giri, R. A. (2021). Mixed-methods research: A discussion on its types, challenges, and criticisms. *Journal of Practical Studies in Education*, 2(2), 25–36.
- [20] Dias, A., Ruthes, S., Lima, L., Campra, E., Silva, M., Bragança de Sousa, M., & Porto, G. (2020). Network centrality analysis in management and accounting sciences. *RAUSP Management Journal*, 55(10), 207-226.
- [21] Falahat, M., Lee, Y. Y., Ramayah, T., & Soto-Acosta, P. (2020). Modelling the effects of institutional support and international knowledge on competitive capabilities and international performance: Evidence from an emerging economy. *Journal of International Management*, 26(4), 100-112.
- [22] Forliano, C., de Bernardi, P., & Yahiaoui, D. (2021). Entrepreneurial universities: A bibliometric analysis within the business and management domains. *Technological Forecasting and Social Change*, 165(1), 522-540.

- [23] Fryatt, R. J., & Blecher, M. (2023). In with the good, out with the bad: Investment standards for external funding of health? *Health Policy Open*, 5(1), 1-6.
- [24] Granstrand, O., & Holgersson, M. (2020). Innovation ecosystems: A conceptual review and a new definition. *Technovation*, 90(1), 102-116.
- [25] Huggins, R., Prokop, D., & Thompson, P. (2020). Universities and open innovation: The determinants of network centrality. *The Journal of Technology Transfer*, 45(3), 718–757.
- [26] Kim, K. N. (2019). Teachers' administrative workload crowding out instructional activities. *Asia Pacific Journal of Education*, 39(1), 31-49.
- [27] Lundberg, A., de Leeuw, R., & Aliani, R. (2020). Using Q methodology: Sorting out subjectivity in educational research. *Educational Research Review*, 31(1), 1-9.
- [28] Mathopo, S., Pretorius, J. H. C., & Pretorius, L. (2024). Entrepreneurial intention and entrepreneurial behavior of research scientists: An extended conceptual framework. In R. Zimmermann, J. C. Rodrigues, A. Simoes, & G. Dalmarco (Eds.), *Human-centred technology management for a sustainable future*. Cham: Springer.
- [29] Moghimi, M., Masoudi, A. I., Tourani, S., Jafari, M., & Derakhshani, N. (2024). Challenges and barriers to commercialization of health sciences research results: A qualitative study. *Health Scope*, 13(3), 1–10.
- [30] Nugent, A., Chan, H., & Dulleck, U. (2022). Government funding of university–industry collaboration: Exploring the impact of targeted funding on university patent activity. *Scientometrics*, 127(2), 29–73.
- [31] O'Dwyer, M., Filieri, R., & O'Malley, L. (2023). Establishing successful university–industry collaborations: Barriers and enablers deconstructed. *The Journal of Technology Transfer*, 48(1), 900–931.
- [32] Pujotomo, D., Ma'aram, A., Isyraf, M. I., Syed Hassan, S. A. H., & Sutopo, W. (2025). The scenario of accelerating technology commercialization at research university: A system dynamics approach. *Journal of Open Innovation: Technology, Market, and Complexity*, 11(1), 497-505.
- [33] Radko, N., Belitski, M., & Kalyuzhnova, Y. (2023). Conceptualising the entrepreneurial university: The stakeholder approach. *The Journal of Technology Transfer*, 48(1), 955–1044.
- [34] Ratinho, T., Amezcua, A., Honig, B., & Zeng, Z. (2020). Supporting entrepreneurs: A systematic review of literature and an agenda for research. *Technological Forecasting and Social Change*, 154(1), 119-130.
- [35] Rossoni, A. L., de Vasconcellos, E. P. G., & de Castilho Rossoni, R. L. (2024). Barriers and facilitators of university–industry collaboration for research, development and innovation: A systematic review. *Management Review Quarterly*, 74(2), 1841–1877.
- [36] Schneckenberg, D. (2009). Understanding the real barriers to technology-enhanced innovation in higher education. *Educational Research*, 51(4), 411-424.
- [37] Siwiec, D., Gajdzik, B., Gawlik, R., Wolniak, R., & Pacana, A. (2025). Open eco-innovations in sustainable product development: Model framework of design thinking in quality life cycle assessment (DT-QLCA). *Journal of Open Innovation: Technology, Market, and Complexity*, 11(1), 480-492.
- [38] Sohail, K., Belitski, M., & Christiansen, L. C. (2023). Developing business incubation process frameworks: A systematic literature review. *Journal of Business Research*, 162(1), 113-120.
- [39] Tseng, F. C., Huang, M. H., & Chen, D. Z. (2020). Factors of university–industry collaboration affecting university innovation performance. *The Journal of Technology Transfer*, 45(2), 560–577.
- [40] Woelert, P. (2023). Administrative burden in higher education institutions: A conceptualisation and a research agenda. *Journal of Higher Education Policy and Management*, 45(4), 409–422.

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