

FROM RESEARCH TO IMPACT



FORTHEM Alliance Good Practices Shaping a European University with Global Outlook

Maria Josep Picó Garcés & Eusebio Llácer Llorca (Eds.)



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INTRODUCTION

FROM RESEARCH TO IMPACT. FORTHEM ALLIANCE GOOD PRACTICES SHAPING A EUROPEAN UNIVERSITY WITH GLOBAL OUTLOOK

| Maria Josep Picó Garcés¹ and Eusebio Llàcer Llorca²

The European Universities Initiative (EUI) was launched by the European Commission in 2018 with two main objectives: first, to promote shared European values and strengthen a common European identity; and second, to foster a substantial leap forward in the quality, performance, attractiveness, and international competitiveness of European higher education. In less than a decade, the proposal to establish European university alliances has evolved into a vivid example of deep institutional transnational cooperation, contributing to the development of a European University with a global outlook. At the same time, these alliances advance the Bologna Process goal for the European Higher Education Area (EHEA) by 2030: the creation of an inclusive, innovative, and interconnected academic landscape characterized by seamless cross-border mobility, automatic mutual recognition of qualifications, and the promotion of green and digital transitions.

The construction of both the European Education Area (EEA) and the European Research Area (ERA)

is consolidating the legacy of the Bologna Process through action in key thematic areas, including internationalization, access and inclusion, fundamental values, digitalization, and innovative approaches to teaching, learning, research, and knowledge transfer—the three core missions of contemporary universities. Simultaneously, these initiatives address the emerging challenges faced by Europe and an increasingly globalized world, ranging from the ethical integration of artificial intelligence and governance restructuring to demographic changes and the preservation of academic values.

The FORTHEM European university project (Ref: 101089463, ERASMUS-EDU-2022-EUR-UNIV-1) is funded by the European Union through the ERASMUS+ programme. The European university FORTHEM is made up of nine multidisciplinary public research universities with strong regional roots: Johannes Gutenberg University of Mainz (Germany), University of Burgundy Europe (Dijon, France), University of Palermo (Italy), University of Jyväskylä (Jyväskylä, Finland),

1 University of Valencia, 

2 University of Valencia, 

University of Latvia (Riga, Latvia), University of Opole (Opole, Poland), University of Agder (Kristiansand, Norway), Lucian Blaga University of Sibiu (Romania) and the University of Valencia.

One of the most important pillars of the FORTHEM Alliance is advancing a comprehensive innovation and research strategy that contributes to the broader European higher education agenda. In this context, in 2022 FORTHEM published its first collective volume, *FORTHEM Alliance Universities' Selected Good Practices in Research and Innovation: Towards a European University*, coordinated by María Dolores Pitarch-Garrido and Isabel Mendoza-Poudereux and published by Publicacions de la Universitat de València. Over the past four years, new challenges have emerged, not only in the international political sphere and through the impact of armed conflicts on the European continent, but also through the rapid expansion of generative artificial intelligence in society at large and, more specifically, across the various domains of university activity.

This second collective volume, *From Research to Impact: FORTHEM Alliance Good Practices Shaping a European University with Global Outlook*, seeks to collect, analyse, update, and disseminate best practices identified across the nine partner universities of the FORTHEM Alliance in the fields of knowledge transfer, university–industry collaboration, and high-impact entrepreneurship. This book aims to provide a comparative perspective, supported by evidence-based insights and operational recommendations that may be useful

to the academic community and institutional decision-makers and stakeholders within innovation ecosystems. Furthermore, this publication complements and updates the previous volume by incorporating the latest developments in research, communication, knowledge transfer, and entrepreneurship, particularly in the light of the transformative impact of artificial intelligence.

This work is aligned with the activities of the FORTHEM Alliance and the priorities of the European Research Area. Among these priorities are innovation and transfer to create and share knowledge, development of new concepts, technologies, and innovations at unprecedented speed, and fostering innovation to support the creation and scaling-up of start-ups and small and medium-sized enterprises (SMEs) in Europe through strengthened technology transfer mechanisms. To attain this, we need to explore joint research and innovation (R&I) structures across European Universities, share research infrastructures and other resources, and develop a common research and innovation agenda and action plan to ultimately strengthen human capital, enabling balanced brain circulation, in synergy with the education mission of the alliances. Also, it is essential to work towards mainstreaming comprehensive Open Science practices, including open education and data practices, engaged research, striving to make knowledge square (education, research, innovation, and service to society) a reality, and finally, strengthen HEIs' links to the R&I landscape in Europe and its outreach towards society and the economy.

FORTHEM gathers these inputs and, in its Research, Innovation and Transfer Mission, commits to sharing good practices in research and innovation across partner universities, emphasizing a sense of joint venture (Grant Agreement, WP7). This publication is a specific commitment defined as a Milestone to collect best practices regarding all actions to boost research strategy and train researchers (WP7, task 7.3).

The volume is structured into two distinct parts. The first is devoted to academic reflection developed by different groups of researchers from across the FORTHEM Alliance. The second adopts a more practical orientation and presents 48 newly compiled good practices. The academic section comprises eight chapters devoted to diverse, complementary and highly topical areas. This is the case with artificial intelligence –covered in two chapters, one coordinated by the University of Opole and written by members of the FORTHEM Digital Transformation Lab, and another by the University of Agder–; the research dimension of EUI Alliances (Johannes Gutenberg University), or the co-creation, also in two chapters: applied to citizen science (University of Jyväskylä) and approaching the blue economy (University of Palermo). Finally, this academic section offers a more in-depth analysis of territorial governance through hybrid and co-productive perspectives to create knowledge ecosystems (University Bourgogne-Europe), and a living lab and open-innovation methodology for green transition (University of Valencia).

The 48 good practices are organised around six fundamental thematic areas: 1) Boosting research-based solutions and their exploitation by local SMEs: valorization models, spin-offs, licensing, incubation and acceleration, technology transfer offices; 2) Training researchers in technology and knowledge transfer: curricula, micro-credentials, summer schools, industrial PhDs, TTO/KTO roles, mentoring, and impact assessment; 3) Evaluating success stories and opportunities for international start-ups: metrics, scalability factors, internationalization, alliances, funding, risks, and limitations; 4) Operational recommendations for partner universities in their local environments: governance, internal incentives, IP management, public/private funding, regional innovation policies; 5) Engagement with non-academic stakeholders (local SMEs and other organizations) for exchange on topics of common interest: co-creation, living labs, R&D contracts, societal engagement, and participation mechanisms; and 6) Examining how artificial intelligence is transforming and enhancing the processes of knowledge transfer from universities to the business sector and the broader society, including the opportunities, challenges, and implications for innovation, collaboration, and societal impact.

As coordinators of this publication, we would like to express our sincere gratitude to all FORTHEM teams across the partner universities, as well as the researchers and technical staff who have contributed to both the academic chapters and the collection of good practices.

We would also like to acknowledge the outstanding role played by Esther Enjuto from the International Relations Office and the FORTHEM leadership team

at the University of Valencia, whose technical and administrative coordination has been essential to bring this collective volume to fruition.

PART I: ACADEMIC CHAPTERS

CHAPTER 1

THE RESEARCH DIMENSION OF EUROPEAN UNIVERSITY ALLIANCES: IMPLICATIONS FOR FORTHEM

Nicole Birkle*

1. Introduction: from a networking instrument to a research capacity layer

Since its launch in 2019, the European Universities Initiative has become a highly visible instrument of European integration in higher education. European policy papers increasingly present alliances as vehicles for long-term institutional change, while also pointing to barriers that still limit deeper integration and sustainability. This shift matters because alliances now work across all university missions. Still, programme boundaries and national regulations often create friction. However, the long-term credibility of the initiative depends less on the volume of short-term activities than on whether alliances become stable environments for cooperation (European Commission, 2025a; EPRS, 2025).

Two developments make the research dimension more strategic. First, policy debates on competitiveness and resilience increasingly expect universities to trans-

late knowledge into visible contributions to European capabilities, including technology, societal resilience, and innovation uptake. Second, skills agendas treat knowledge circulation, talent development, and employability as European capacity issues. Together, these trends push alliances toward more integrated models that connect research, innovation, skills, mobility, and stakeholder engagement (European Parliament, 2025a; European Commission, 2025b; European Parliament, 2025b). This broader expectation is also reflected in the FOREU4ALL discussion paper, which presents alliances as long-term European structures that need coherent legal, financial, and policy conditions in order to develop their full potential (FOREU4ALL, 2025).

Research also strengthens the legitimacy of alliances by helping them connect the logics of the European Education Area and the European Research Area, rather than remaining limited to a single policy field (Maassen et al., 2023). For FORTHEM, as for many other alliances, an important step towards this integrated

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approach (Fig. 1) was the Horizon 2020 SwafS-project FIT FORTHEM (GA 101017248), which contributed to establishing a dedicated mission for research, innovation, and transfer under the umbrella of the Erasmus+ projects in the second funding cycle (FIT FORTHEM, n.d.).

This chapter focuses on three guiding questions: (1) How is research articulated in alliances' self-understanding and strategic narratives? (2) Which organizational mechanisms translate research ambitions into repeatable practice? (3) Which structural constraints remain outside alliance control and require system-level change? FORTHEM is used as an illustrative case because it develops a clear pipeline logic linking research, innovation, talent development, and regional ecosystems, and because relevant outputs are publicly available (e.g., FORTHEM Alliance, 2026a; FORTHEM Alliance, 2025a).

2. Conceptual framework: research integration in European University Alliances

Research literature increasingly describes European University Alliances as structured forms of cooperation between autonomous universities. Studies on the formation of alliances also show that they emerge through complex and often non-linear processes of negotiation, identity building, and organizational experimentation (Charret and Chankseliani, 2023; Maassen et al., 2023). Because member institutions retain their own authority, alliances face coordination challenges such as sustaining commitment, aligning management practices, and building common routines without hierarchy. For that reason, research integration is best understood as an institutionalization challenge: the key question is whether collaboration becomes durable and routine, supported by shared infrastructures, incentives, and professional capacity (Maassen et al., 2023).



Fig. 1: From Educational Networks to Integrated Knowledge Alliances

To analyze research integration across alliances, this chapter distinguishes between two layers. First, alliances develop narratives of research integration, meaning how they present research in mission statements, strategies, and public communication. Second, alliances build mechanisms of research institutionalization - the structures and operating models that turn aspiration into repeatable practice. This distinction matters because alliances may adopt ambitious narratives long before they develop mechanisms that reliably generate cross-border research cooperation, such as recurring consortium formation, stable support routines, shared infrastructures, and structured pathways from knowledge to uptake (CESAER, 2024; The Guild, 2025).

Mechanisms of institutionalization can be understood as an interacting set of components: thematic integration spaces, enabling capacity, talent and skills ecosystems, and regional uptake and partnership architecture. Together, these elements help turn collaboration into a repeatable practice; where they are missing, cooperation often remains episodic (FORTHEM Alliance, 2026a). Research integration also functions as an instrument for internationalization. Recent work on higher education informal diplomacy suggests that alliances can also be understood as spaces in which universities develop new forms of cross-border relationship-building and strategic cooperation beyond traditional mobility formats (Cino Pagliarello, 2024). Traditional internationalization strategies often focus

on mobility figures, partnership breadth, and outward visibility. Alliance-based research integration instead supports internationalization by design: repeated cross-border collaboration formats, shared thematic spaces, and federated support structures lower transaction costs and make international research interaction more routine. In this way, alliances can turn internationalization into organizational capacity rather than relying mainly on individual brokerage and create low-threshold entry points, such as matchmaking, seed support, training formats, and structured mobility, for researchers who might otherwise remain outside international networks (FORTHEM Alliance, 2025e). Research integration in alliances also contributes to a specifically European form of internationalization, which has been described as “Euro-internationalization” in recent scholarship on the initiative (Frame and Curyło, 2025).

A related dimension is the professionalization and internationalization of research management. In alliances, research management has become more than a local support function. It increasingly develops into a transnational field of practice that includes knowledge of funding architectures, consortium requirements, and cross-border administrative conditions.

At the European level, these developments also align with the broader ERA Policy Agenda 2025–2027, which places renewed emphasis on research careers, research security, science for policy, and enabling conditions for

stronger research and innovation systems (EUA, 2023; FORTHEM Alliance, 2023b; EDUC European University Alliance, 2025; European Commission, 2025c).

Taking together, these perspectives support a central claim: the research dimension of alliances is not simply a matter of having more joint projects. It is a capacity-building process in which internationalization, professionalization, and institutionalization develop together. Alliances become more sustainable when they turn cross-border collaboration from exceptional events into normal institutional practice.

3. Material and approach

The chapter combines three types of material. First, it uses FORTHEM documentation as an illustrative case, focusing on publicly available outputs that explain mechanisms for research integration at the intersection of regions, innovation pathways, and researcher careers. Second, it draws on EU-level policy syntheses on the European Universities initiative and related ERA and skills agendas. Third, it uses peer-reviewed research on alliance dynamics, including work on stratification and inclusion risks (Lambrechts et al., 2024).

The chapter follows a mechanism-oriented case approach. It treats FORTHEM's published outputs as evidence of how an alliance conceptualizes and designs research integration mechanisms; it then relates these mechanisms to broader alliance narratives and policy

expectations documented in EU syntheses and alliance policy briefs from other alliances. This design supports analytical generalization (i.e., transferable mechanism propositions) rather than statistical representativeness. To avoid over-claiming, descriptive statements are restricted to what is documented in the cited sources; broader implications are framed as propositions or outlook considerations.

4. Outlook across alliances: recurring narratives and emerging focal themes

Across the initiative, alliances increasingly describe themselves as integrated European knowledge ecosystems rather than loose cooperation platforms. Recent scholarship has discussed whether this reflects a broader shift in European transnational collaboration and the emergence of alliances as communities of practice (Palmowski, 2025). This also reflects the broader evolution of the European Universities Initiative as a layered policy process in which new objectives and expectations have gradually accumulated over time (Charret, 2026). EU policy reports stress that long-term success depends on deeper institutional integration and on the removal of persistent barriers, which implies that research cooperation must move from project-based experimentation toward more stable forms. At the same time, alliances' own ERA policy briefs offer a complementary view: they describe progress and recurring obstacles

around infrastructures, data, careers, governance, and research management (e.g., FORTHEM Alliance, 2022; Arqus European University Alliance, 2022; FORTHEM Alliance, 2023a; ENGAGE.EU, 2024; RUN-EU, 2025; European Commission, 2025a).

These texts point to several recurring ways in which alliances frame the research dimension. First, research is presented as an identity anchor: alliances frame joint research as the foundation for long-term commitment and community building among academics, often linked to thematic priorities and shared infrastructures. Second, research is framed as challenge-driven collaboration and societal impact: alliances emphasize interdisciplinary approaches, co-creation with societal actors, and pathways that translate knowledge into demonstrable contributions. Third, research is framed as capability aggregation: shared services, interoperability, and coordinated support reduce fragmentation and enable recurring collaboration. Fourth, research is framed through talent ecosystems: alliances connect research integration to skills development, careers, mobility, and research culture reform, thereby aligning the initiative with ERA and skills agendas. More recently, some alliance-related discussions also extend this research narrative toward resilience and risk preparedness. This includes themes such as critical infrastructures, information resilience, systemic risk, crisis preparedness, and forms of “secure openness”, suggesting that the research dimension is also being linked to Europe’s wider resilience and security agenda.

4.1. Research in the self-descriptions of European University Alliances (selection, no claim to completeness)

A review of alliance mission, vision, and strategy statements shows that several European University Alliances present research as a central part of their identity. Some examples: 4EU+ states that its vision is to create “One Comprehensive Research-Intensive European University” and links this directly to cooperation in education, research, innovation, and outreach. Arqus describes itself as a “forward-looking, open, integrated, and research-driven European University” and defines its mission as transforming higher education, research, and innovation through deep cooperation and progressive integration. Circle U. presents itself as a research-intensive and interdisciplinary alliance that combines education, research, and innovation to contribute to more sustainable, democratic, and healthier societies. Ulysseus explicitly states that it aims to shape both the European Higher Education Area and the European Research Area. It has developed a common research and innovation agenda to increase alliance-level impact and visibility. CIVICA presents research as one of its key priority areas and describes the alliance as strengthening collaboration in education, research, innovation, and civic engagement across borders. EUniWell links its alliance mission to a research-based contribution to policy, pedagogy, and well-being, and it is building a common research and innovation framework aligned

with the ERA. CHARM-EU describes itself as a challenge-driven, accessible, research-based, and mobile alliance, and its vision refers explicitly to European research, innovation, and education traditions as a joint foundation. In FORTHEM, a dedicated research mission was established in 2022, on an equal footing with the four other missions of the alliance.

Taken together, these examples suggest that research is increasingly embedded in alliance self-descriptions as a core dimension of European cooperation, often closely linked with innovation, societal impact, and long-term institutional transformation.

Two cross-cutting themes stand out across alliance debates: research assessment reform and the professionalization of research management. Both are increasingly treated as enabling conditions for sustainable collaboration rather than as secondary support topics (CoARA, 2022; EUA, 2024).

Beyond these narratives, several topics have gained importance as preparedness themes for alliances. Work emerging from cross-alliance exchange on risks and resilience suggests that alliances are increasingly expected to mobilize knowledge around hybrid threats, information integrity, critical infrastructures, security-related innovation, and ethics by design - fields that require trusted cross-border coordination and credible governance of dual-use risks. This has an important implication: resilience themes are not simply additional research topics. They also test whether alliances can handle interdisciplinary collaboration across

technical, legal, and social-science fields, shared standards, and robust ethics and research security practices (FORTHEM Alliance, 2025f; European Commission, 2025d).

A further outlook theme concerns Europe's next multiannual funding cycle and the architecture of research and competitiveness instruments. Several stakeholder contributions argue that alliances risk becoming pilots without pathways if they are expected to deliver structural integration while remaining dependent on short-term, fragmented funding and without coherent legal frameworks. At the same time, debates around FP10 and a possible European Competitiveness Fund highlight tensions between maintaining space for frontier research and accelerating translation to market-ready outputs. From an alliance perspective, the key issue is participation: if funding shifts too strongly toward industry-oriented, high-TRL instruments, access may narrow for many universities and disciplines unless programme design keeps a balanced portfolio and allows different roles along the knowledge-to-uptake chain (The Guild, 2025; Science Business, 2025; LERU, 2024; FORTHEM Alliance, 2025b; FORTHEM Alliance, 2026b).

A useful way to read these narratives is as an integration gradient. At one end, alliances focus on coordination and visibility through mapping, networking, and exploratory cooperation. In the middle, they develop shared instruments such as seed funding, joint calls, training formats, and proposal pipelines that create re-

peated interaction and measurable outputs. At the far end, they move toward institutional integration through shared infrastructures, interoperable services, co-governance, and aligned incentives. A central challenge is to move from intermediate cooperation formats to more deeply embedded forms of integration under conditions of fragmented governance and funding.

On research assessment, alliance communication often points to a similar tension: reform is widely supported in principle, but implementation remains difficult where funder and evaluation practices still rely on narrow metrics. This helps explain why alliances treat CoARA alignment both as an internal reform agenda and as an external coordination issue that also requires change on the funder side. Where such reform is embedded in alliance-level learning and pilot activity, alliances can serve as relatively safe spaces for testing evaluation practices before they are mainstreamed across institutions (CoARA, 2022; EUA, 2024; FORTHEM Alliance, 2025c).

5. Structural constraints: why research narratives do not automatically institutionalize

Despite strong ambitions, the institutionalization of research cooperation remains constrained by structural factors. First, fragmented governance between the EEA and the ERA makes it difficult to build coherent incentive structures and long-term planning. Alliances often must navigate different logics of legitimacy, reporting,

and evaluation across programmes, sometimes without stable mechanisms to align them. This fragmentation can lead to parallel governance arrangements inside alliances, for example, separate education and research structures, and it limits the ability to build truly integrated operating models.

Second, national legal and regulatory diversity affects employment conditions, procurement, data governance, and funding rules. This creates friction for joint governance, shared infrastructures, and cross-border support services for research. It also raises transaction costs and reduces predictability, because alliances must invest considerable effort in local workaround solutions instead of substantive scientific collaboration.

Third, access to research infrastructures is frequently limited not only by law but by operational and financial constraints, including mobility resources, training and user support capacity, staff time, and the rules attached to nationally funded infrastructures. These constraints are often underestimated because policy debates focus on legal barriers, while day-to-day feasibility is determined by cost recovery models, capacity bottlenecks, and support routines that enable users to access complex facilities. When infrastructure access cannot be routinised, the alliance loses one of the most powerful mechanisms for repeated collaboration and competence diffusion.

Fourth, the dominance of short-term project funding undermines continuity. If core support capacities (e.g., policy intelligence, proposal support, partnership

management) are funded only through time-limited projects, alliances struggle to stabilize pipelines and to retain professional staff who hold institutional memory. Policy debates increasingly recognize that structural integration requires stable enabling conditions and credible pathways beyond pilots; the European Parliament has explicitly highlighted the risk that insufficient research and innovation integration undermines the alliances' potential. (The Guild, 2025; European University Association, 2026; European Parliament, 2025a; European Parliament, 2025b).

Fifth, capacity asymmetries across partners can reproduce stratification. Empirical studies of the initiative highlight that alliance formation may reinforce hierarchies and existing inequalities in European higher education if inclusion is not actively addressed (Rensimer and Brooks, 2025; Lambrechts et al., 2024). This has direct implications for the research (Maassen et al., 2023): if alliances are evaluated primarily through indicators that reward short-term outputs (e.g., proposal success, publications, patents), the risk is that high-capacity institutions dominate alliance research portfolios while other members become peripheral. Designing inclusive research pipelines, therefore, requires differentiated participation models, deliberate capacity building, and governance arrangements that treat diversity as an asset rather than a deviation.

A forward-looking constraint concerns architecture, topic, and TRL orientation. If future EU funding instru-

ments shift further toward industry-oriented, high-TRL formats, parts of the university sector may find it harder to participate, as they are mainly dependent on European funding for frontier, curiosity-driven, and early-stage applied research. Alliance positions on FP10 stress the importance of maintaining a stand-alone framework programme with enough room for bottom-up excellence and disciplinary diversity, while also warning that too close a link to competitiveness instruments could narrow participation and distort incentives. For alliances, this means that research integration strategies should be robust under different funding scenarios, including those in which applied instruments expand but do not align well with university-led research cultures (FORTHEM Alliance, 2025b).

A sixth constraint concerns financial sustainability and the cost of integration. Alliance work requires staff time, coordination infrastructures, mobility budgets, and shared digital and administrative capacity. Where these costs are not covered structurally, alliances depend on cross-subsidization by member institutions, which can create unequal burdens and limit long-term planning. Sector analyses, therefore, link alliance sustainability to stable funding, leadership commitment, and clearer pathways for long-term embedding in institutional strategies (European University Association, 2025).

The next Multiannual Financial Framework (MFF) will be decisive because it will shape both the rela-

tionship between Erasmus+ and FP10 and the extent to which competitiveness agendas influence future funding design. From an alliance perspective, two risks stand out: fragmentation, if integration is expected but funding remains split across instruments with different rules and timelines; and narrowing, if competitiveness is defined mainly through high-TRL and industry-driven logics. In that case, parts of university research, especially where impact is social, cultural, policy-relevant, or long-term, may become less visible or less fundable. For alliances, this means building pipelines that can support translation and uptake where appropriate, while preserving space for frontier and curiosity-driven research and maintaining inclusive participation across disciplines and partners.

6. The FORTHEM case: operationalizing research integration

In FORTHEM, the research dimension is framed within a broader alliance mission that links European attractiveness and competitiveness with talent development, inclusion, and sustainable transformation. It also reflects the alliance's wider vision of shaping "the next generation of creative minds and responsible citizens." More specifically, the strategic goals of the research mission are to foster joint research projects, strengthen an ecosystem for early-stage researchers and international careers, and position FORTHEM as

a recognized partner in research-based innovation and policy stakeholder relations (FORTHEM Alliance, 2025e). FORTHEM shows how an alliance can translate research integration into a more stable operating model. The nine thematic FORTHEM Labs play a central role as recurring thematic spaces that connect research cooperation with education, stakeholder engagement, and, where relevant, innovation and transfer. In this way, they help move collaboration from isolated projects toward more continuous forms of interaction and provide a setting in which ideas can mature into proposals and longer-term cooperation (FORTHEM Alliance, 2022; FORTHEM Alliance, 2026a).

This thematic layer is supported by alliance-level enabling capacity. FORTHEM's joint support structures link policy intelligence, opportunity management, proposal support, and stakeholder engagement. This reduces fragmentation and helps turn collaboration opportunities into concrete outcomes. It also highlights a wider point: research integration depends not only on academic interest, but also on shared professional capacity in research management, including knowledge of funding schemes, consortium requirements, and cross-border administrative conditions. In this sense, alliances can also serve as learning environments for the professionalization and internationalization of research support (FORTHEM Alliance, 2023b; FORTHEM Alliance, 2026a).

A third element is the early-stage researcher ecosystem. Through mentoring, training in transferable skills and funding schemes, science communication, and structured mobility formats, FORTHEM links researcher development to alliance capacity building. These activities are framed as proof-of-concept interventions that respond to wider ERA challenges such as fragmented career pathways, unequal recognition, and limited preparedness for competitive funding. They also support longer-term institutional aims, including shared standards, clearer researcher development pathways, and stronger incentives for collaborative and open research practices (FORTHEM Alliance, 2025a; FORTHEM Alliance, 2025d).

These design elements are closely linked to regional ecosystems. By using RIS3 as a coordination layer, FORTHEM connects research strengths, stakeholders, and uptake pathways across regions without reducing research value to narrowly market-based criteria. This is especially relevant in the context of possible shifts toward higher-TRL and more industry-oriented funding, because it allows alliances to define different roles along the knowledge-to-uptake chain while preserving space for societal, cultural, policy-relevant, and curiosity-driven research (FORTHEM Alliance, 2026a; FORTHEM Alliance, 2026b).

Finally, the FORTHEM case shows that research assessment reform is not a parallel issue but part of the research dimension itself. If assessment systems

recognize collaboration, open science, teamwork, and societal engagement, alliance-based research is more likely to become part of normal academic practice rather than an additional task. Conversely, if narrow metrics continue to dominate evaluation and funding, the institutionalization of alliance-based research remains limited (FORTHEM Alliance, 2025c; CoARA, 2022).

7. Discussion: what alliances should prepare for (resilience, internationalization, and funding shifts)

The analysis suggests that the research dimension of alliances now has three closely connected roles: (i) it helps institutionalize cooperation by creating durable routines, (ii) it supports the internationalization of research and research support functions, and (iii) it provides a platform for emerging resilience and risk domains. The resilience perspective is especially important because it highlights tensions around secure openness: alliances are expected to mobilize knowledge across borders while also strengthening research security, ethics, and responsible collaboration.

Current debates on European competitiveness make the importance of the research dimension especially visible. The Letta report on the future of the Single Market argues for a “fifth freedom” centered on knowledge, research, innovation, and education, and links this directly to Europe’s future competitiveness. (Letta,

2024). From an alliance perspective, the fifth freedom requires practical environments in which cross-border research cooperation becomes normal, legally workable, and supported by interoperable services and infrastructures.

The Draghi report makes a related point from the angle of competitiveness. It describes Europe's challenge as an innovation and investment gap and calls for stronger capacity to turn Europe's strengths into productive and competitive industries. But closing that gap presupposes a robust research base and transnational collaboration capacity: without a strong research dimension, competitiveness policy risks becoming downstream industrial support detached from the knowledge systems that generate future capabilities. In the same vein, the independent expert report chaired by Manuel Heitor argues for a portfolio approach that combines excellence, industrial competitiveness, societal challenges, and a strong research and innovation ecosystem. Applied and industry-oriented instruments, therefore, cannot replace a strong research base; they must build on it (Draghi, 2024; European Commission, 2024).

Resilience themes challenge alliances in two ways. In substantive terms, they require interdisciplinary cooperation across technical, legal, and social-science fields, often in sensitive stakeholder environments such as public authorities, critical infrastructure operators, and security-related industries. In organizational

terms, they require governmental capacity for ethics by design and for the management of dual-use risks. Alliances can contribute here by offering trusted settings in which shared standards and responsible collaboration practices can be developed and tested before they spread into wider institutional routines (FORTHEM Alliance, 2025f; Circle U. European University Alliance, 2025).

Internationalization adds another layer. Beyond internal European cooperation, alliances are increasingly linked to broader forms of external partnership-building, academic resilience, and informal diplomacy (Cino Pagliarello, 2024; Cino Pagliarello et al., 2025). This suggests that the research dimension of alliances may gain further importance not only within the European knowledge system, but also in a wider geopolitical context.

At the same time, alliances also increase the internationalization of research support by strengthening cross-border professional capacity in research management (EUA, 2023; EDUC European University Alliance, 2025).

Funding shifts intensify these dynamics. Several stakeholder contributions warn that alliances risk becoming pilots without pathways if they are expected to deliver structural integration while remaining dependent on fragmented funding and without coherent legal frameworks. If future competitive instruments expand and absorb larger parts of the research landscape, alliances may need to protect research diversity while also

strengthening translation pathways in ways that remain compatible with university missions. A pipeline-based approach offers one possible way forward: it allows different roles along the knowledge-to-uptake chain while keeping room for early-stage and curiosity-driven research at the knowledge-production layer (The Guild, 2025; European Parliament, 2025b; FORTHEM Alliance, 2026a).

More broadly, two implications follow. First, alliance-level enabling capacity - including policy intelligence, partnership management, and proposal support - should be treated as a strategic investment rather than as overhead. Second, research assessment reform and career conditions should be integrated into the research dimension rather than treated as separate agendas, because incentives and skills shape whether collaboration becomes sustainable. In this sense, alliances are not only sites of cooperation, but also implementation environments for ERA priorities and skills agendas, provided that system-level conditions allow scaling beyond pilots.

Finally, the stratification risk points to the need for explicit inclusion strategies. If alliances are to act as European capability infrastructures, they must avoid concentrating on benefits in a small subset of institutions or disciplines. This requires differentiated participation models and deliberate capacity building, especially in research management and funding literacy, so that lower-capacity partners can take part meaningfully in

the stages where they add value and where participation itself builds capability over time.

Across the broader alliance landscape, a clear pattern emerges: alliances increasingly combine policy positioning with efforts to build operational capacity. ERA policy briefs and alliance documents often move from identifying barriers to proposing implementation-oriented remedies such as shared services, interoperability initiatives, and structured career and skills instruments. This suggests that alliances are becoming an important link between European policy ambition and institutional practice. Future comparative research could examine whether research integration stabilizes where such capacities move beyond project cycles.

8. Conclusion

European University Alliances are increasingly expected to deliver more than short-term cooperation. They are becoming long-term structures for building transnational capacity across education, research, innovation, and societal engagement. This chapter argues that research integration should be understood as an institutional challenge: alliances need structures and routines that stabilize collaboration beyond individual projects. Using FORTHEM as an illustrative case, the chapter has shown how pipeline design, RIS3-based regional engagement, alliance-level enabling capacity, and ESR talent ecosystems can support research inte-

gration while also strengthening internationalization and the professionalization of research management. At the same time, durable research integration remains constrained by fragmented governance, legal diversity, infrastructure-related operating constraints, short-term funding logics, and stratification risks. For the next phase of the initiative, a central requirement is coherent, long-term enabling conditions that allow alliances to scale pipelines, assessment reform, and preparedness work without reducing research diversity to high-TRL participation only.

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CHAPTER 2

CO-CREATIVE CITIZEN SCIENCE IN SCHOOLS PROJECT

Petteri Laihonen¹ and Katarzyna Molek-Kozakowska²

1. Objectives of the project

The objectives of the Co-creative Citizen Science in Schools project can be summarized as follows:

- Address multilingualism and linguistic diversity in European schools.
- Test and refine a Co-creative Citizen Science (CCS) model.
- Build sustainable school–university partnerships through co-creation.
- Implement shared ownership across all research stages.
- Examine codesign and collaboration practices with schools.
- Identify conditions and challenges of longterm co-creation.
- Expand CCS outcomes to include engagement and collective responsibility.

2. Implementation of the project

In 2020, the FORTHEM Alliance established a framework called the Labs for cooperation between universities and nonacademic partners through co-creative projects that bring together academic researchers, external partners, students, and citizens. The Co-creative Citizen Science in Schools project was established as one of the first Multilingualism in School and Higher Education Lab outputs. The Universities of Jyväskylä and Opole have been coordinating the project. The University of Valencia, Johannes Gutenberg University, Mainz, and the University of Agder, together with their partner schools, have joined the project. A wealth of external partners has also participated, such as Eurac Research, Bozen/Bolzano (autonomous province of South Tyrol, Italy), Åbo Akademi University (Finland), University of Navarra (Spain), and University of South Carolina (United States).

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Citizen Science (CS) has been conceptualised as research on which the public contributes to science, with the outcome being new knowledge. We discuss CS projects in schools in Finland and Poland, addressing the challenges of linguistic diversity. In this project, we have been committed to Co-Creative Citizen Science (CCS), where non-professional participants are involved in all stages of the research process, and the control over the process is shared. The Co-creative Citizen Science in Schools project has the goal of testing and refining our model for Co-creative Citizen Science in applied (socio)linguistic research in educational settings. The project actively involves different members of society and partner universities, that is, researchers, university students, school pupils, and (head) teachers.

We have designed the different roles and responsibilities of the participants as follows:

The project leaders in Jyväskylä and Opole have served as Principal Investigators for the projects. They have prepared the ethical guidelines for projects and stored all materials in a database. The work of the PIs was carried out in collaboration with other team members; for example, training materials to introduce the projects for new schools, citizen scientists, and facilitators –including extension to new partners in new languages such as Italian, German, Swedish, and Spanish– were co-produced with university students. University students have functioned as facilitators. In Jyväskylä, they have been undergraduate students of the Language Aware Multilingual Pedagogy (LAMP) study program for pre-service language teachers. The researchers trained the students in the basic research process and research ethics in CCS. The main task of students was to mediate between the researchers and the pupils, supporting the pupils, but not making decisions on their behalf. Students’ feedback has been

Table 1: Roles and responsibilities

Design	Design / facilitate	Facilitate	Participate	Facilitate / design
Principal Investigators	Researchers	University students	Students and pupils as citizen scientists	(Head) teachers
Lead, train, manage data and ethics	Train, do research	Train, do research	Do research	Integrate into curriculum and school

collected through post-project sessions and written reflection reports. (Head)Teachers, primarily teaching language arts, communication, and social studies, have played a crucial role in the design phase by representing their schools and integrating CCS projects into the curriculum.

Recent innovations include that in Opole, the University of Opole students have taken a leading role (see blog 1). In Jyväskylä, a special edition with international student facilitators in English was conducted in 2025 (see blogs 2 & 3).

The process of collaborating with schools and co-organizing the research process from design phase to action (see Robinson et al. 2024) has been presented by the Opole project leader, Katarzyna Molek-Kozakowska, as follows.

The Co-creative Citizen Science in Schools project addresses the challenges of linguistic diversity in European schools with the goal of testing and refining our model for Co-creative Citizen Science in applied (socio) linguistic research. In Jyväskylä, the projects are continued on the initiative of the key external partner,

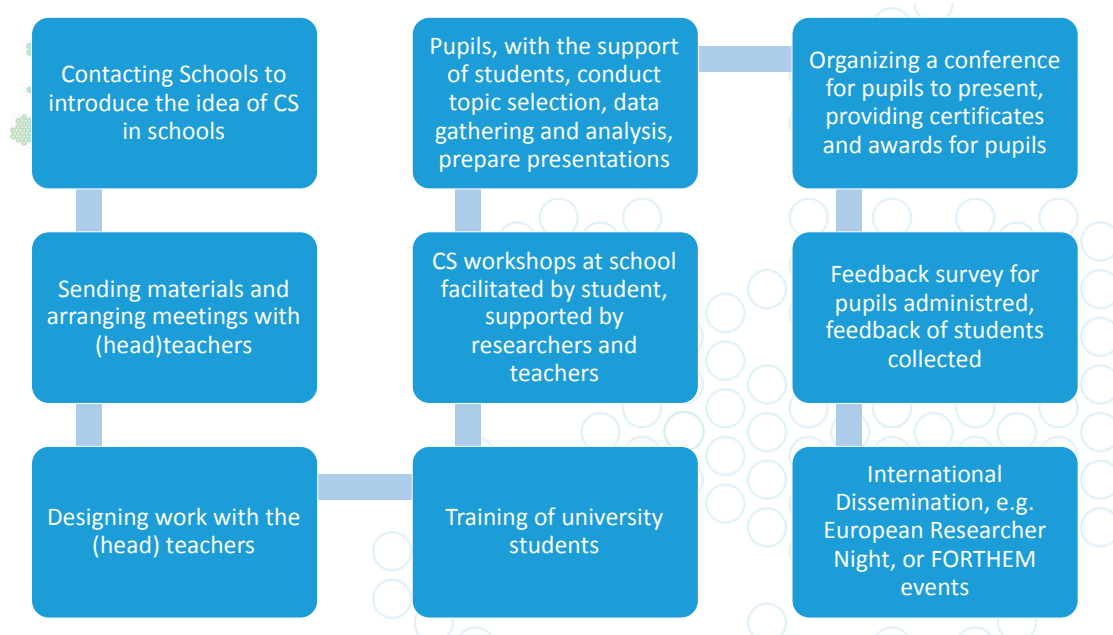


Figure 1: A process diagram for cooperation with schools © K. Molek-Kozakowska

the Mankola comprehensive school, since 2020. The Mankola school is a public comprehensive school run by the City of Jyväskylä, providing compulsory basic (elementary and lower secondary) education inclusively for the entire age cohort. Ages 6 to 16 attend grades 1 to 9 in this school. We have engaged the grades 7-9 (ages 12-16), which are the final grades of basic education in Finland, after which the 16-year-olds continue in different strands for vocational or academic secondary strands. The Mankola comprehensive school in Jyväskylä is attended mainly by youth in the school district, most children with special needs are integrated into the mainstream classes with support measures in place. The (head)teachers of the Mankola school had expressed long-term interest and commitment in language-related collaboration and citizen science. The CCS projects have been integrated into the Mankola School curriculum since 2020. The collaboration between the University of Jyväskylä and Mankola school in CCS was borne out of mutual interest by different individual actors, researchers, and (head)teachers in the first place, but there was no tradition or established institutional structure.

At the University of Jyväskylä, the CCS projects have been integrated into a course for undergraduate students of the Language Aware Multilingual Pedagogy (LAMP) study program for pre-service language teachers. The course is an introductory course for becoming a LAMP teacher, consisting of general lectures

and a school project, attended annually since 2020 by circa 8 LAMP students.

3. Highlights of the project

We have recognized the following benefits and highlights for CCS projects (on evaluating CS projects, see Sobieraj 2022) in the University of Jyväskylä and Mankola school collaboration:

- For JYU, the chance to partner with non-academic stakeholders, and bridge research and studies, collaboration with the Mankola school and LAMP since 2020, reaching continuity and sustainability.
- Integrating schoolwork with university students', researchers', and teachers' work.
- LAMP students get a "deep" hands-on experience of facilitating pupils' work.
- Pupils gain experience and understanding by doing the whole research project in collaboration with the teacher.
- Pupils get to use functional English for an advanced, practical purpose.
- Pupils' awareness of the possibility of sharing the project results beyond the school.
- Pupils and teacher students increased self-efficacy: Both benefit through the experience of completing a project.

We have recognized the following challenges for CCS projects at the University of Jyväskylä:

- Limited institutional commitment to supporting logistics, scheduling, and coordination.
- Constraining working conditions in schools (e.g., teacher substitution).
- Weak explicit alignment between language research and Finnish National Core Curriculum objectives, affecting motivation and mainstreaming.
- Low self-efficacy among pupils and student teachers in conducting and facilitating language research.
- Lack of shared infrastructure between institutions.
- Restricted communication channels between organisations, adults, and pupils (e.g., file sharing, restricted platforms).
- Limited researcher time for observation and sustained engagement.
- Co-creation is a new activity for many participants, with low levels of previous experience.
- Ongoing need for justification, training, and relationshipbuilding due to a lack of mainstreaming.

Recognizing the persistence of the challenges, we find that the benefits outweigh the difficulties. From an analytical perspective, the benefits of including pupils in CCS are clear for learning: participating schools gain support in reaching science education goals in language subjects through inquiry-based learning. This

positive impact is underlined by the continuation of collaboration at the request of schools, not only in Jyväskylä but also in Opole. One key contribution has been recognizing pupils' engagement—as evidenced by the vast majority in reflective discussions with teachers, students, and researchers—as a central outcome of CCS in schools. Thus, we have come to see CS not merely as science education enhancing youth capacity for the knowledge economy, but as a tool for connecting language researchers with the public to co-create pathways to engagement and social activism. The societal impact is evident in shared recognition that science and language research are accessible to all. The project demonstrates that democratization of participation in science is possible and inclusive: participation was not limited to highperforming pupils, and very few opted out (for reasons unrelated to CCS).

4. Results and Impact

The results and impact are presented in numbers. By 2026, c. 75 CCS projects had been co-created by 30 researchers, 75 university students, 25 schoolteachers, and c. 550 13–18-year-old students and pupils in 15 schools. The project's results and dissemination activities are documented at the FORTHEM Multilingualism Lab web pages as well as through a YouTube playlist (MSCEDU). Two journal articles (Laihonen, Deutschmann & Molek-Kozakowska 2025; Molek-

Kozakowska & Laihonen 2025) report and analyse the results of 2020-2023. In 2023-2026, we have been increasingly engaged in academic dissemination and project planning, participating among others in a Horizon call and presenting at the 5th European Citizen Science Association (ECSA) conference in Vienna (2024) and the Language Campus seminar in Jyväskylä.

The project dissemination has taken place in over ten FORTHEM events at the University of Jyväskylä and partner universities, where researchers, (head) teachers, JYU students, and Mankola pupils have presented. For a report on the 2025 December Lab meeting participated by the JYU team, including a Mankola teacher in Kristiansand, Norway, organized by the University of Agder, see blog 3.

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CHAPTER 3

HARNESSING ARTIFICIAL INTELLIGENCE FOR INCLUSIVE AND PERSONALIZED LEARNING

Insights from Cognitive and Educational Research

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1. Introduction

Generative artificial intelligence (GAI) has rapidly moved from being a specialized technological development to becoming a tangible presence in everyday educational practice. While artificial intelligence has long been used across domains such as healthcare, engineering, and media production, the public release of large language models in 2022 marked a turning point for education, making powerful generative tools widely accessible to teachers and students (Kasneci et al., 2023; Zawacki-Richter et al., 2019). As a result, education has emerged as one of the fields most visibly affected by recent advances in generative AI.

This rapid diffusion became accompanied by intense debate. Concerns have been raised regarding ethical use, academic integrity, and the potential impact of AI on learners' cognitive engagement (Kosmyna et al. 2025; Selwyn, 2019). At the same time, much of the emerging research has focused on generative AI as a form of tutoring or automated support, often

evaluated through short-term outcomes such as task completion, motivation, or performance (Kasneci et al., 2023). Comparatively less attention has been paid to how generative AI can be pedagogically integrated into classroom practice in ways that actively support learning processes rather than replace them. In language education in particular, this distinction is critical, as learning involves sustained cognitive engagement with planning, formulation, monitoring, and revision (Kellogg, 1996; Levelt, 1989).

One of the field's most persistent challenges is how to support diverse learners in inclusive and pedagogically meaningful ways without placing unsustainable demands on teachers. Personalized learning has long been promoted as a key strategy for fostering inclusion in heterogeneous classrooms. By adapting tasks to learners' proficiency levels, interests, and learning needs, personalized approaches aim to increase engagement, motivation, and accessibility (Pane et al., 2015; Bernacki et al., 2021; Mohammad Ali, 2025). Despite strong theoretical support, personalization has

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often proven difficult to implement at scale. Large class sizes, limited preparation time, and curricular constraints make it challenging for teachers to design and maintain individualized learning pathways for many students simultaneously (Zhang et al., 2020). As a result, personalization has frequently remained an aspirational goal rather than an everyday classroom reality.

In ESL and EFL classrooms, these challenges are particularly pronounced. Learners often differ widely in linguistic background, prior exposure to English, and access to support outside school. Such variability means that uniform instructional approaches risk privileging some learners while marginalizing others (Cummins, 2007). From an inclusion perspective, the question is not whether personalization is desirable, but how it can be realized in ways that are pedagogically sound and practically sustainable.

Here, generative AI appears to offer a partial solution. Unlike earlier adaptive systems based on predefined pathways or fixed difficulty levels, generative models can dynamically produce explanations, examples, and tasks in response to a wide range of inputs. This flexibility positions GAI as a potentially powerful tool for supporting personalized learning in language education, where learners' needs and trajectories vary substantially (Cope et al., 2020; Major et al., 2021). At the same time, the rapid adoption of these tools raises important concerns. Without pedagogical structure and

guidance, generative AI risks being used primarily as a productivity shortcut, solving tasks for learners rather than supporting their cognitive engagement, thereby potentially reinforcing existing educational inequities (Selwyn, 2019; Kirschner et al., 2006).

This tension highlights the need to move beyond the question of whether generative AI can be used in education and toward a more nuanced examination of how it should be designed and integrated to support inclusive learning. In particular, there is a growing need for research that connects AI-supported personalization with insights from cognitive and educational theory. Understanding how learners interact with AI tools, how these interactions shape cognitive processes such as planning, monitoring, and revision, and how pedagogical guidance influences these processes is essential if generative AI is to contribute meaningfully to learning rather than merely to efficiency (Sweller et al., 2019; Hayes, 2012).

This chapter draws on a series of classroom-based studies and ongoing research conducted in Scandinavian upper-secondary language education to examine how generative AI can support inclusive and personalized learning when grounded in pedagogical and cognitive principles. Building on earlier empirical work demonstrating that AI-supported personalization can enhance learner motivation, engagement, and task suitability (Mohammad Ali, 2023; Mohammad Ali, 2025), the chapter synthesizes findings across studies

to identify broader patterns and design implications. The chapter examines the conditions under which AI-supported personalization can contribute to inclusive and cognitively meaningful classroom practice.

A central argument advanced in this chapter is that the educational value of generative AI does not lie in the technology itself, but in how it is pedagogically framed. Personalization that attends only to surface-level adaptation, such as adjusting task difficulty or topic, may increase engagement, but remains insufficient if it does not also support learners' cognitive engagement with language. From an inclusion perspective, this distinction is crucial. Learners with weaker linguistic foundations or limited instructional support are particularly sensitive to how tasks are structured and scaffolded. Poorly guided AI use risks amplifying disparities, whereas thoughtfully designed guidance has the potential to reduce them.

2. Personalized Learning as an Inclusion Strategy

Inclusive education is increasingly understood as the design of learning environments that accommodate learner variability from the outset, rather than as a set of compensatory measures for specific groups of students. From this perspective, inclusion is not achieved by retrofitting instruction for learners who deviate from a perceived norm, but by anticipating diversity as a fundamental condition of classroom practice (Florian,

2014). Within this framework, personalized learning has gained prominence as a potential strategy for addressing heterogeneity by aligning instruction with learners' needs, interests, and capabilities.

Personalized learning is a broad and often inconsistently defined concept. Large-scale reviews highlight substantial variation in how personalization is conceptualized and implemented across educational contexts, ranging from adaptive pacing and task difficulty to interest-based content, learner choice, and individualized feedback (Bernacki et al., 2021; Zhang et al., 2020). Despite this diversity, a common underlying goal can be identified: to better align instructional design with learner characteristics in order to enhance engagement, motivation, and learning outcomes. In language education, where classrooms are typically characterized by wide variation in linguistic proficiency, prior knowledge, and learning trajectories, this goal is particularly important.

From an inclusion perspective, the pedagogical value of personalization lies not in individualization per se, but in its capacity to normalize variation. When tasks are adapted to learners' current levels of competence and embedded in meaningful contexts, students are more likely to experience a sense of autonomy and competence, key psychological needs associated with intrinsic motivation (Deci & Ryan, 2000). Empirical research has consistently linked such alignment to higher engagement and improved learning outcomes,

including in second language contexts (Pane et al., 2015; Alisoy, 2025). Importantly, personalization may be especially beneficial for learners with weaker academic foundations, as it allows them to engage with tasks at an appropriate level without being publicly identified as struggling.

Despite its strong theoretical foundation, personalized learning has proven difficult to enact consistently in everyday classroom practice. Teachers often face constraints related to time, curriculum, assessment demands, and class size, which limit their ability to design and sustain differentiated learning pathways (Zhang et al., 2020; Gunawardena et al., 2024). As a result, personalization is frequently implemented in partial or superficial ways, such as minor adjustments to task difficulty or optional enrichment activities, rather than as an integrated pedagogical approach. Research syntheses have repeatedly identified this implementation gap as a central challenge in translating personalization from policy discourse and theoretical models into classroom reality (Bernacki et al., 2021).

Here, generative artificial intelligence can be proposed as a potential means of addressing this gap. By enabling the rapid generation of tasks and effectively diagnosing student level, feedback, and explanations tailored to specific inputs, GAI tools appear to lower the practical barriers associated with personalization at scale. In language learning contexts, AI-powered systems have demonstrated potential to support adaptive

practice, targeted feedback, and learner engagement, with several studies reporting positive effects on motivation and language outcomes when AI-supported personalization is thoughtfully integrated (Major et al., 2021; Alisoy, 2025). From an inclusion standpoint, this raises the possibility of extending personalized support to a broader range of learners without proportionally increasing teacher workload.

At the same time, not all forms of AI-supported personalization are pedagogically equivalent. Reviews of personalized learning research caution against treating personalization as a monolithic construct, noting that different design features may serve different purposes and yield different outcomes (Bernacki et al., 2021). Adapting surface features of tasks, such as topic or pacing, may enhance engagement, but does not necessarily support deeper learning or long-term development. Moreover, when personalization is driven primarily by efficiency or automation, there is a risk that learners become passive recipients of AI-generated content rather than active participants in the learning process.

To assess the inclusive potential of AI-supported personalization, it is therefore necessary to distinguish between its underlying dimensions and mechanisms. Content-based personalization, which aligns tasks with learners' proficiency levels and identified weaknesses, primarily addresses accessibility and perceived competence. Topic-based personalization, which situates learning activities within learners' interests and experi-

ences, supports relevance and engagement. Empirical evidence suggests that both dimensions can positively influence motivation, but their educational value depends on how they are combined and embedded within pedagogical design (Pane et al., 2015; Bernacki et al., 2021).

Crucially, inclusion cannot be reduced to motivational outcomes alone. Learners' ability to engage meaningfully with tasks is also shaped by cognitive factors such as cognitive load, attentional demands, and opportunities for self-regulation. For students who already experience linguistic or academic vulnerability, poorly structured tasks, even when personalized, may increase extraneous cognitive load and undermine learning. Research on individualized instruction in classroom settings demonstrates that alignment between task demands and learner capacity is a core dimension of instructional quality, regardless of whether personalization is teacher-led or technology-supported (Tetzlaff et al., 2022).

These considerations suggest that inclusive personalization requires more than adaptive content generation. It requires principled pedagogical guidance that supports learners' cognitive engagement with tasks. Such guidance may include structured workflows, explicit prompts, and scaffolds that support planning, monitoring, and revision. When these elements are integrated into AI-supported learning environments, personalization shifts from being a technical feature to a deliberate pedagogical design choice.

3. Teacher perspectives and early classroom integration

The work presented in this chapter did not begin with a framework. It began with a practical question: what happens when teachers try to use generative AI in their own classrooms, with their own students, under the everyday constraints of time, curriculum, and responsibility?

In a series of upper-secondary ESL classrooms in Sweden, teachers experimented with AI-supported grammar instruction over the course of four weeks. The approach was intentionally simple. Instead of assigning generic grammar exercises, teachers input students' own essays into the AI system and ask it to identify recurring grammatical patterns. Based on these patterns, the system generated progressive practice tasks designed to target areas of partial mastery. In other words, the students' writing was not treated as an end product to be graded, but as diagnostic material from which future learning tasks could be built.

The decision to use learner essays as input was pedagogically deliberate. Students' texts reveal instability where tense shifts unexpectedly, where clause boundaries blur, and where agreement falters. These are precisely the places where development is underway but not yet consolidated. By grounding task generation in these moments, teachers sought position practice within students' Zones of Proximal Development: challenging enough to stretch competence, but close enough to existing control to remain attainable.

At the outset, teachers were cautious. Concerns about accuracy, ethical implications, and student over-reliance surfaced immediately. Would AI provide misleading explanations? Would students bypass thinking by accepting machine-generated answers? Would this undermine rather than support learning? These concerns reflected broader uncertainties about generative AI in education, but they also reflected something deeper: a professional commitment to protecting learner agency.

What became evident over time, however, was that the technology itself was not the decisive factor. What mattered was how it was framed and mediated. When teachers reviewed AI-generated tasks carefully, adjusted their difficulty, and ensured that students were required to produce and revise their own language, the materials felt aligned rather than intrusive. Teachers described AI as producing draft starting points that saved time but still required pedagogical judgement.

Students, in turn, appeared to respond differently to tasks derived from their own writing. Because the exercises were recognizably connected to what they had attempted, the work felt more relevant. Teachers observed fewer procedural questions and more sustained engagement with the grammar itself. The alignment between task and learner seemed to reduce friction. Rather than asking, “Why are we doing this?” students could see the connection to their own texts.

From an inclusion standpoint, this shift was significant. Personalized grammar instruction has long been a pedagogical ambition, yet in large and diverse

classrooms it is difficult to enact consistently. The intervention suggested that AI could assist teachers in producing differentiated tasks more efficiently. But this assistance did not replace professional judgement; it depended upon it. Where teachers framed prompts carefully and retained oversight, the technology appeared to extend their capacity to respond to learner variability. Where guidance was looser, the benefits were less clear.

The most important lesson from these early classroom encounters was therefore not that generative AI “improves learning” in any straightforward sense. Rather, it became clear that the educational value of AI was contingent on teacher interpretation, deliberate prompt design, and maintaining students’ cognitive responsibility for their own language production.

It was at this point that a more systematic question began to emerge: if technology’s value depends on how it is mediated, how might that mediation be conceptualized more clearly? What principles distinguish productive use from superficial integration? And how can teachers remain central to personalization in AI-supported environments? These questions would shape the next phase of the work.

4. From feasibility to design: disentangling dimensions of personalization

The early classroom work clarified that AI-supported personalization was possible. The more demanding

question that followed was not whether personalization works, but what kind of personalization makes a meaningful difference in real classrooms.

To explore this more systematically, the focus shifted toward the pedagogical architecture of personalization itself. Rather than treating personalization as a single variable, the subsequent study (Mohammad Ali, 2025) disentangled two theoretically distinct dimensions enabled by generative AI: content personalization and topic personalization. While both are often grouped under the same label, they operate through different mechanisms and address different educational concerns.

Content personalization refers to aligning tasks with learners' demonstrated proficiency levels and recurring grammatical needs. In practice, this meant generating grammar activities from students' own writing, targeting structures that were unstable but developmentally accessible. Topic personalization, by contrast, embeds those same grammatical targets within contexts drawn from learners' interests, hobbies, sports, media, or personal experiences. The grammar focus may remain identical, but the situational framing changes.

This distinction is not merely procedural. It reflects a deeper theoretical divide grounded in Self-Determination Theory (Deci & Ryan, 2000). Content personalization primarily supports learners' sense of competence by ensuring that tasks are challenging yet manageable. Topic personalization primarily supports autonomy by

sitting learning in contexts learners perceive as meaningful and self-endorsed.

Empirically, both dimensions contributed positively to learner motivation, perceived task suitability, and engagement (Mohammad Ali, 2025). However, their effects were not equivalent. Tasks aligned with proficiency reduced instructional friction, fewer clarification requests, fewer signs of confusion, and stronger perceptions of task appropriateness. Tasks aligned with interest increased persistence and completion. The most substantial effects emerged when both dimensions were combined: when tasks were simultaneously linguistically calibrated and personally meaningful.

From an inclusion perspective, this interaction is particularly revealing. Learners with weaker grammatical foundations appeared to benefit most clearly from content alignment, which reduced unnecessary cognitive strain. At the same time, interest alignment mitigated disengagement across proficiency levels by increasing perceived relevance. When combined, the two dimensions functioned as a dual scaffold supporting both access and sustained engagement.

This pattern aligns with broader findings in the personalization literature suggesting that effective differentiation must address both cognitive challenge and learner relevance (Pane et al., 2015; Minn, 2022). Personalization that focuses exclusively on difficulty may improve accessibility without increasing commitment. Personalization that focuses exclusively on relevance

may increase enthusiasm without sufficiently calibrating challenge. The intersection of the two appears to be where the most meaningful gains occur.

Importantly, these findings reposition personalization from being a technical affordance of AI systems to being a pedagogical design problem. Generative AI enables rapid variation in task difficulty and context, but the educational value of those variations depends on how they are combined. The data suggests that personalization becomes more powerful when it simultaneously reduces barriers to entry and increases reasons to persist.

This raises a deeper question. If personalization can increase completion and engagement, what does that mean for learning processes themselves? Does improved alignment simply make tasks more doable, or does it alter how learners cognitively engage with writing and language production? To answer this, it becomes necessary to move beyond motivational outcomes and examine the cognitive architecture of AI-supported learning.

5. Task suitability as a mechanism for inclusive engagement

Across studies, a consistent empirical pattern emerges: AI-supported personalization appears to influence inclusion primarily through its effects on task suitability. Rather than focusing solely on performance outcomes, the studies documented reductions in help-seeking

behaviour, higher task completion rates, and more sustained engagement in personalized conditions (Mohammad Ali, 2025). These indicators are particularly relevant in heterogeneous classrooms, where mismatches between task demands and learner readiness often contribute to disengagement and exclusion.

This emphasis on task suitability resonates with broader research on individualized instruction, which identifies alignment between learner capacity and instructional design as a core dimension of instructional quality (Tetzlaff et al., 2022). Importantly, the observed benefits of AI-supported personalization were not uniform across all learners. Classroom observations revealed considerable variation in how students interacted with AI-generated tasks, suggesting that similar motivational outcomes may mask fundamentally different learning processes. Such variability echoes findings from other studies of AI-mediated learning, which highlight differences in learner agency, strategy use, and reliance on automated support (Wang et al., 2023).

These observations reinforce the need to conceptualize personalization not as a fixed instructional feature, but as a design space requiring ongoing pedagogical calibration. The articulation of the Personalization–Motivation Integration Framework (PMIF) in the 2025 study emerged directly from this need. By linking content and topic personalization to motivational processes, PMIF provides a conceptual lens for understanding how AI-supported personalization can be aligned with inclusive educational goals. Rather

than treating personalization as a purely technical affordance, the framework situates it within established motivational theory, emphasizing the roles of autonomy, competence, and relevance in sustaining learner engagement.

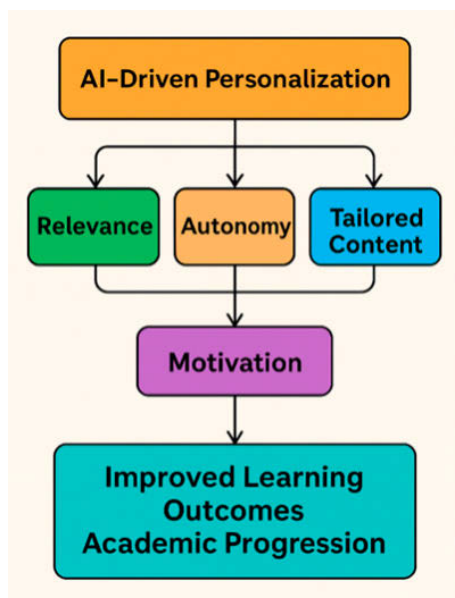


Figure 1: Moving Beyond Outcomes: A Cognitive Turn in AI-Supported Learning

The empirical findings discussed in the previous section demonstrate that AI-supported personalization can enhance learner motivation, engagement, and perceived task suitability in ESL classrooms. In particular, the consistent advantage of combining content and topic personalization highlights the importance of

aligning instructional tasks with learners' proficiency levels and personal interests (Mohammad Ali, 2025). While these findings provide strong evidence for the motivational and inclusive potential of generative AI, they also raise a critical pedagogical question: *what happens cognitively when learners engage with AI-supported personalized tasks?* Addressing this question requires moving beyond outcome-oriented evaluations toward a closer examination of learning processes.

Much of the existing research on generative AI in education has focused on observable outputs, such as test scores, task completion, or self-reported motivation. Although such indicators are valuable, they offer limited insight into how learners process information, regulate their learning, and construct knowledge while interacting with AI tools. This limitation is particularly salient in language education, where learning involves complex, iterative cognitive processes such as planning, formulation, monitoring, and revision (Levelt, 1989; Kellogg, 1996). Without attending these processes, AI-supported personalization risks being evaluated primarily as a productivity-enhancing intervention rather than as a pedagogical resource.

The motivation for a cognitive turn in this research programme emerged directly from classroom observations associated with earlier studies. While learners in personalized conditions were more engaged and required less instructional support, teachers reported substantial variation in how students interacted with

AI-generated tasks (Mohammad Ali, 2023). Some learners used AI outputs strategically, examining explanations, comparing alternatives, and refining their writing, whereas others relied more passively on generated content. These differences suggest that similar motivational outcomes may mask fundamentally different forms of cognitive engagement, underscoring the need to examine *how* learners use AI, not only *whether* they benefit from it.

6. Cognitive load and task design in AI-supported learning

To understand why certain forms of AI-supported personalization appeared to reduce friction and increase completion, it is useful to turn to Cognitive Load Theory (CLT). At its core, CLT reminds us of a simple but powerful constraint: working memory is limited, and learning is compromised when instructional demands exceed that capacity (Sweller, 1988; Sweller et al., 2019). Effective instructional design, therefore, is not merely about presenting content, but about managing cognitive demand so that learners can allocate their mental resources productively.

In language learning contexts, this constraint becomes particular. Writing and grammar tasks require learners to coordinate vocabulary retrieval, syntactic structuring, meaning construction, and monitoring for accuracy, all within the narrow bandwidth of working

memory. When tasks are poorly calibrated to learners' proficiency levels, the cognitive burden can escalate quickly. Learners with weaker linguistic foundations may expend so much effort simply deciphering instructions or grappling with unfamiliar forms that little capacity remains for genuine learning.

Reconsidered through this lens, the earlier findings on task suitability take on deeper significance. Personalized grammar tasks derived from students' own writing likely reduced extraneous cognitive load by eliminating unnecessary complexity and ambiguity. Because the grammatical targets were already present, albeit unstable in learners' texts, the practice was developmentally proximal rather than artificially imposed. This aligns closely with the notion of working within learners' Zones of Proximal Development (Vygotsky, 1978) and with contemporary interpretations emphasizing adaptive instructional calibration (Ferguson et al., 2022).

It is important, however, not to misinterpret "reducing cognitive load" as simplifying learning. The goal is not to eliminate challenges, but to remove unnecessary cognitive barriers that do not contribute to development. Well-designed AI-supported tasks should still require effortful processing. They should demand attention, comparison, and revision. The difference lies in whether that effort is directed toward meaningful language work or wasted on misalignment and confusion.

7. Writing as a Process: Planning, Monitoring, and Revision

If cognitive load theory clarifies why task calibration matters, models of writing help explain what is at stake when learners engage with AI-supported tasks. Writing is not a linear act of transcription but a recursive, cognitively demanding process. Classical models conceptualize writing as involving planning, text generation, and revision, all competing for limited working-memory resources (Hayes, 2012; Kellogg, 1996). In second language contexts, these demands are intensified: learners must negotiate meaning and linguistic form simultaneously, often with partial control over both.

The introduction of generative AI into this already complex system can alter its dynamics in profound ways. When AI produces complete sentences or paragraphs, the formulation stage of the effortful encoding of meaning into language may be partially bypassed. Monitoring and revision may shift from self-regulation to acceptance or superficial editing. In such cases, fluency may increase, but cognitive engagement may decrease.

The earlier empirical findings complicate this picture. In the personalized conditions, reductions in help-seeking and increases in task completion (Mohammad Ali, 2025) suggest that learners experienced greater fluency and fewer breakdowns during writing-related tasks. On the surface, this appears entirely positive. Yet fluency alone does not guarantee learning.

The central question becomes whether that fluency reflects improved cognitive alignment or reduced cognitive effort. The answer depends on how AI is framed pedagogically. When AI is used to generate scaffolded exercises from learners' own texts, highlight patterns in errors, or provide alternative formulations that learners must evaluate, it can support the planning and monitoring processes central to writing development. In such cases, AI functions as an externalized prompt for reflection rather than a replacement for formulation. By contrast, when AI is positioned as a solution generator, learners may disengage from the very processes that foster language growth.

This tension has motivated a shift toward more process-oriented forms of investigation. Rather than relying solely on final texts or self-reported motivation, ongoing research examines screen recordings, revision histories, and learner reflections. These data sources make visible how learners allocate attention, when they pause, how they revise, and whether they actively negotiate meaning or defer to automated output. Such an approach aligns with broader calls in educational research to move beyond product-based evaluation toward analyses that capture the temporal and strategic dimensions of learning (Winne & Hadwin, 2008).

Ultimately, the integration of cognitive load theory and writing process models reinforces a central insight of this chapter: AI-supported personalization is not inherently beneficial or detrimental. Its educational impact depends on whether it preserves learners'

engagement in planning, formulation, and revision while managing cognitive demand in developmentally appropriate ways. The challenge, therefore, is not to increase efficiency but to design AI-mediated tasks that sustain cognitive responsibility.

8. Guidance, agency, and pedagogical framing

When AI use is left largely unguided, learners often default to exploratory or efficiency-driven strategies. Trial-and-error prompting becomes common. Outputs are accepted quickly. Revision may become superficial. For learners with strong self-regulation skills, such open environments can sometimes foster experimentation. For others, particularly those already navigating linguistic or academic vulnerability, unguided AI use can intensify uncertainty. The tool may become overwhelming rather than supportive.

Guided AI use alters this dynamic. When teachers structure interaction through explicit prompts, staged workflows, and clearly defined expectations, for example, asking learners to identify patterns in their own errors, compare alternative formulations, or justify revisions, attention is directed toward cognitively productive activity. The AI does not replace thinking; it becomes an object of thinking.

This distinction reflects long-standing findings in instructional research. Learners with limited prior knowledge benefit disproportionately from structured guidance, whereas minimal guidance environments tend

to privilege those who already possess robust self-regulatory strategies (Kirschner et al., 2006). Importantly, guidance need not undermine autonomy. Structure and agency are not opposites. When prompts invite learners to articulate reasoning, evaluate alternatives, or reflect on revisions, they externalize cognitive processes that might otherwise remain implicit. In doing so, they can support the development of self-regulation rather than constrain it. This balance between structure and autonomy mirrors the earlier motivational findings: personalization was most effective when it supported both competence and autonomy simultaneously (Deci & Ryan, 2000). Guidance, when thoughtfully designed, can do precisely that.

9. From Empirical Insights to Design Principles for Inclusive AI Use

The Personalization–Motivation Integration Framework (PMIF) emerged from an attempt to make sense of a recurring pattern in the classroom data: personalization was not a single mechanism, but a combination of distinct design choices that influenced engagement in different ways (Mohammad Ali, 2025). Rather than treating personalization as a general feature of AI systems, PMIF distinguishes between two dimensions that operate through separate motivational channels.

The first, content personalization, concerns the alignment of tasks with learners demonstrated proficiency levels and grammatical needs. The second, top-

ic personalization, concerns the embedding of those same tasks within contexts that resonate with learners' interests and experiences. Grounded in Self-Determination Theory (Deci & Ryan, 2000), these dimensions correspond to different psychological conditions: competence and autonomy.

The classroom findings revealed that these dimensions do not operate in isolation. Level alignment reduced friction and clarified expectations. Interest alignment increased persistence and willingness to engage. When combined, they produced the strongest motivational and engagement outcomes. Learners were not only able to access the task but also inclined to invest effort in it.

From an inclusion perspective, this interaction is especially important. Content personalization reduced cognitive barriers for learners with weaker linguistic foundations, while topic personalization broadened relevance across proficiency levels. Together, they functioned as a dual scaffold, one that supported access without singling out difference as a deficit. In this sense, PMIF provides an empirically grounded explanation of why personalization matters and which elements are most consequential for inclusive engagement.

At the same time, PMIF operates primarily at the level of task design and motivational alignment. It clarifies how tasks can become more accessible and meaningful, but it does not fully address how learners

cognitively engage with AI-generated content once the task begins. Nor does it explicitly theorize the interpretive role of teachers in shaping that engagement. As the preceding cognitive analyses suggest, these dimensions are not peripheral; they are central. This recognition points toward the need for a broader design perspective.

10. Extending Personalization Through a Cognitive Lens

Revisiting the empirical findings through the cognitive framework developed earlier sharpens the design implications considerably. If working memory is limited and writing is cognitively demanding, then personalization cannot be understood merely as adaptation of topic or pacing. It must also regulate cognitive demand. Level alignment appears to reduce extraneous cognitive load by situating practice within learners' developmental reach (Sweller et al., 2019). However, reducing unnecessary strain does not guarantee learning. Tasks must still require learners to plan, formulate, and monitor language. Personalization that merely accelerates production risks shifting effort away from the learner and toward the system.

Similarly, AI-supported writing tasks can either scaffold or displace core cognitive processes. When learners are prompted to compare alternatives, justify revisions, or identify patterns in their own texts, AI supports

engagement with writing as a recursive process (Hayes, 2012; Kellogg, 1996). When AI supplies fully formed answers, those processes may be truncated.

Guidance, therefore, becomes central. In AI-mediated environments, unguided use often privileges those who already possess strong self-regulatory skills. Structured prompts and deliberate framing, by contrast, can stabilize engagement and reduce inequitable cognitive strain. Together, these considerations suggest that inclusive personalization requires more than motivational alignment. It requires a pedagogical architecture that shapes how learners think with and through AI tools.

11. Toward a Human-Centred Model: Introducing TIP-AI

If PMIF clarifies what dimensions of personalization matter, the next step is to clarify how those dimensions are enacted responsibly in practice. This chapter, therefore, proposes Teacher-Interpreted Personalization with AI (TIP-AI) as an extension of the earlier framework.

TIP-AI begins from a simple premise: generative AI does not personalize learning on its own. Personalization is achieved through interpretation. Teachers provide diagnostic input, often in the form of learner texts, define instructional intentions, and frame prompts that constrain AI output. The system generates provisional materials, which teachers review, adapt, sequence, and contextualize. Students then engage with these

materials within structures that preserve cognitive responsibility. The cycle continues through reflection and refinement.

In this model, AI functions not as an autonomous tutor but as a generative partner. Its output is treated as drafts rather than decisions. Teachers retain authority over difficulty, sequencing, and the degree of guidance embedded in tasks. This interpretive layer is not ancillary; it is the condition under which personalization remains pedagogically meaningful.

The emphasis on teacher mediation aligns with broader human-centred AI principles that stress transparency and meaningful oversight (Amershi et al., 2019; Shneiderman, 2022). More importantly, it addresses a central inclusion concern. Delegating instructional judgement to algorithms risks amplifying disparities through miscalibrated difficulty or unexamined bias. By contrast, positioning teachers as epistemic gatekeepers ensures that AI-supported personalization remains responsive to contextual knowledge and learner variability. A TIP-AI-informed design might, for example, require learners to analyze multiple AI-generated revisions and justify their selection rather than simply accepting a generated paragraph. In doing so, technology supports variation and feedback while preserving engagement with planning and monitoring processes.

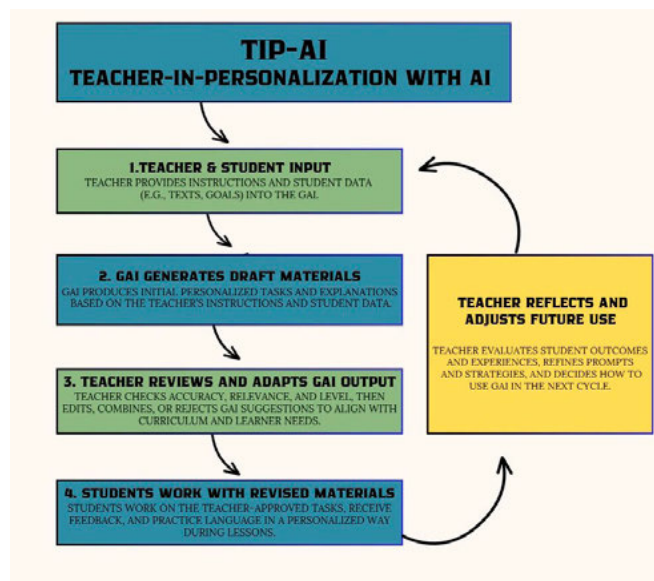


Figure 2

The framework outlines how teachers guide GAI-mediated personalization by providing input, reviewing and adjusting outputs, supporting student engagement, and iteratively refining the process. It reflects a human-centred approach in which GAI augments rather than replaces teacher judgement.

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CHAPTER 4

BUILDING A CULTURE OF KNOWLEDGE TRANSFER

The ULBS Approach

Adrian Florea, Daniel Hunyadi and Delia Stefenel*

1. Introduction and Theoretical Framework

Fostering talent and nurturing innovation through collaboration are critical in navigating the complex challenges (the twin transition-green and digital, growing skill shortages, rising societal challenges, and intensified global competition) and exciting opportunities to enhance the impact of universities in regional development. The following themes might be of interest for universities to shape the future of talent and innovation (Bodley-Scott & Oymak,2022; Meerman & Jaber,2025):

- University-Industry Partnerships are key to building resilient, mutually beneficial relationships across research and education. Transforming regular partnerships into strategic ones by multiple modes of collaboration, like combining research, talent development, curriculum co-creation, and infrastructure sharing.
- Building entrepreneurial pathways out of the university from the classroom and lab to the market,

accelerating the development of university start-ups and spin-offs.

- Building capacities in emerging technologies (e.g., AI, cybersecurity, quantum computing, blockchain), enhancing education for the skills of tomorrow, and developing the current and future workforce.
- Establishing universities as the main element of Regional Innovation Ecosystems. In an innovative landscape defined by complexity and uncertainty, institutions that cultivate strong, diverse, and resilient partnerships will be best positioned not only to contribute but to lead in addressing the challenges and opportunities of the coming decade.

The new role of universities is to monetize their research through intellectual property portfolios and create spin-off companies, with knowledge and technology transfer offices supporting researchers in protecting and commercializing their innovations. This shift has also led universities to promote an entrepreneurial mindset among students through curricular activities

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that encourage creativity, risk-taking, and entrepreneurial thinking. Additionally, universities now play an active role in regional entrepreneurial ecosystems by creating spin-offs, training future entrepreneurs, generating high-skilled jobs, and helping to retain specialized talent within Europe (Bosschere & Vardanega, 2021).

Drawing on ULBS's research and experience with various projects and partnerships with local, national, and multinational companies, this chapter examines the changing role of university-industry collaboration, emphasising the importance of long-term strategic alliances for building a culture of knowledge transfer and offering practical advice for leaders looking to build more resilient, impactful, and future-ready partnerships. In recent years, the relationship between universities and industry has evolved from a „nice to have” to an „essential” for institutional leaders and national innovation agendas—whether to drive technological advancement, develop future-ready talent, or contribute to regional innovation ecosystems (Meerman & Jaber, 2025).

Positioned at the intersection of the Entrepreneurial University model, the Quadruple Helix framework, and Regional Innovation Systems, and grounded in principles of Knowledge Transfer and Responsible & Inclusive Innovation, this chapter offers an integrated perspective on how organizational culture and institutional change enable universities (in this case, Lucian

Blaga University of Sibiu–ULBS) to transform research excellence into tangible society and economic value.

Hasso Plattner Knowledge Transfer Institute at Lucian Blaga University of Sibiu (ITCHPI-ULBS) serves as a bridge between Academia, industry, and public institutions. Through interdisciplinary research, technology-driven projects, and strategic partnerships, the institute fosters innovative ecosystems that encourage co-creation and the practical application of scientific results. Initiatives such as Sibiu Innovation Days² and Horizon Europe collaborations reinforce this open and collaborative framework, enhancing the university's role in regional innovation networks (Florea & Meinel, 2021).

The rest of this chapter is structured as follows. Section 2 reviews the methodology (multi-level embedded case study, qualitative and quantitative methods) applied in ULBS efforts to build a culture of innovation and the research questions. Section 3 describes the institutional transformation at ULBS based on knowledge transfer, and Section 4 highlights the role of ITCHPI-ULBS in fostering innovation culture and talent development in higher education and boosting territorial innovation in Southern Transylvania, Romania. Section 5 presents the Design Thinking School (D-School), fostering creativity and entrepreneurial mindsets. Section 6 approaches the ecosystem engagement and regional impact of ULBS. Section 7 highlights the conclusions and presents future research directions.

2 <https://events.ulbsibiu.ro/innovationdays/>

2. Methodology

This section adopts a multilevel embedded case study approach to analyze the development of a knowledge transfer culture at Lucian Blaga University of Sibiu (ULBS). A mixed-methods design combines qualitative institutional analysis, document analysis, participant observation, quantitative performance indicators, and comparative benchmarking. The study integrates organizational culture theory and the Quadruple Helix framework to explain how institutional structures and shared mindsets co-evolve to foster sustainable innovation.

With ULBS serving as the primary case and embedded units like the Knowledge Transfer Institute, HPI-ULBS is responsible for organizing innovation events, hackathons, community engagement initiatives, and the Design Thinking School. The Research and Development Department is responsible for internal grant schemes, EU-funded projects, and the research design employs a multi-level embedded case study methodology.

As part of qualitative methods applied in the case study, the ITCHPI-ULBS manager and university leadership had a lot of meetings and discussions with companies, sharing the business needs (especially in the industry because in the Sibiu area the industrial sector predominates) and how the academic environment can complement the industrial one in a win-win approach.

At these meetings, company leaders, researchers, and IT clusters leaders usually participated. Separate meetings and semi-structured interviews were held with local, regional, and European policy makers with double purposes: to find the society's needs and keep aware of changes, grant calls, hot topics, and decisions at the European level. Students served as a key focus group for developing an innovative mentality and entrepreneurial culture. During D-School activities and programming competitions—hackathons and industrial workshops organized as part of Sibiu Innovation Days events—students are encouraged to collaborate and are incentivized with consistent prizes from company sponsorships or various opportunities facilitated by European projects. Participant observation (as part of a qualitative research method) was conducted during innovation events and industrial and design thinking workshops to examine how students perceived the impact of their active involvement on the development of their innovation-related skills. Mentors from the university and experts from companies attend innovation workshops with students, participate in the activities, and observe how students collaborate, solve problems, and develop innovation skills, while taking structured notes for later analysis.

Document analysis was conducted on university strategic plans, internal regulations, grant calls, partnership agreements, EU project documentation, and technology maturity reports. This qualitative method

aims to trace the institutional evolution of innovation activities and identify the governance mechanisms supporting research commercialization and collaboration. Comparative benchmarking was used to analyze ULBS against similar regional universities in Romania and Europe to identify distinctive features of its knowledge transfer model. It is an analytical method for institutional and ecosystem analysis, combining elements of document analysis, performance metrics, and case comparison. It provides evidence on how ULBS' Knowledge Transfer Center (ITCHPI-ULBS) operates relative to peers and how best practices (e.g., from Hasso Plattner Institute, Potsdam, Germany) could be adapted.

Quantitative methods used in this research include the analysis of institutional performance indicators such as the number of EU projects, funding volume, patents, spin-offs, industry contracts, research mobility, and interdisciplinary publications, as well as surveys assessing innovation culture, collaboration readiness, entrepreneurial intention, institutional trust, and knowledge transfer engagement. The purpose of these methods is to objectively evaluate institutional innovation performance and to measure perceptions, attitudes, and engagement related to innovation and knowledge transfer of ITC HPI-ULBS and the RD & I department.

The research questions aim at both institutional transformation, organizational culture, and the mindset of all Quadruple Helix actors to create an ecosystem of responsible innovation with regional impact at the

societal level. Adopting emerging technologies but keeping the balance between innovation, risks, and societal impact. This chapter addresses the next research questions:

RQ1. How has ULBS developed an institutional culture that supports knowledge transfer and innovation?

RQ2. How is a knowledge transfer mindset cultivated among academic staff and students?

RQ3. What role do design thinking and entrepreneurship play in fostering an innovative culture?

RQ4. What is the role of the Knowledge Transfer Institute HPI-ULBS within the Quadruple Helix for boosting regional innovation?

RQ5. How does ULBS integrate societal needs into research and innovation agendas?

3. Institutional Transformation at ULBS

The 2025 European Innovation Scoreboard classifies Romania as an *Emerging Innovator*, performing at about 37.7% of the EU average, highlighting the country's innovation gap relative to other Member States and the need for stronger RD&I capabilities (European Commission, 2025). Studies on creativity and innovation in Central and Eastern European universities show a „creativity gap” between countries like Romania and innovation leaders and strong innovator countries from Europe. This highlights the potential role of universities

in improving knowledge transfer and regional innovation performance (Florea & Meinel, 2021; Marczewska, Weresa & Lachowicz, 2024).

This section aims to answer to the following research question: „RQ1: How has ULBS developed an institutional culture that supports knowledge transfer and innovation?” more precisely, describes how ULBS contributes to increasing competitiveness in the Sibiu region by creating collaborative networks, digital education and training platforms, as well as fostering applied research projects building on Hasso Plattner Institute’s experience in Potsdam, Germany (Florea & Meinel, 2021).

ULBS implements two main activities to reduce the innovation gap faced by other countries and improve the regional innovation performance:

- Providing institutional incentives (short-term mobility for PhD or staff at universities, partners from FORTHUM Alliance) and other internal mechanisms to stimulate interdisciplinary collaboration and funding. Encouraging academic staff to write a project proposal for third parties to solve real-world problems.
- Writing project proposal at different European calls: Horizon Europe, Digital Europe, Erasmus+ Alliance for Innovations, EEA Grants, etc. See such statistics, only from 2025, in Table 1. Unfortunately, writing proposals does not guarantee obtaining funds (some unofficial statistics show that only one

project is often financed), but it helps improve writing, technical, project management, and budgeting skills, and creates and strengthens an international network with complementary expertise from different geographical zones.

Interdisciplinary collaborations are effective in generating measurable outputs, including high-quality scientific publications, innovative solutions, increased research impact, and successful acquisition of competitive funding. As a brief statistic, between 2020 and 2025, 72 collaboration projects between ULBS staff and third parties were implemented. During the pandemic period, there was a decrease; since 2023, the number of projects has doubled compared to the previous period. As a conclusion, we noticed that only 4 from 9 faculties of ULBS have such collaboration: the Faculty of Social Sciences and Humanities, the Faculty of Medicine, the Faculty of Agricultural Sciences, and the Food Industry, respectively. Also, at least three scientific publications at international conferences were developed and published in collaboration with representatives of companies and the Sibiu city hall.

Table 1: European Applications Proposals of ITC HPI-ULBS in 2025

No.	Title of the grant proposal	Beneficiary	European Call	Financed
1.	GUIDE+: digital ecosystem for career guidance, validation, and upskilling (8 partners)	ULBS – Beneficiary Smart Secure Network cluster (PL) – Coordinator	ERASMUS-EDU-2025-PI-FORWARD-ADULT-CG	NO
2.	Centre of Excellence for Innovation, Commercialisation, and Strategic Partnerships in Smart Specialisation and Digital Transformation (11 partners)	ULBS – Coordinator	HORIZON-WIDERA-2025-ACCESS-01-01-two-stage	NO
3.	Advancing European Research Infrastructures with AI-powered Digital Twins (21 partners)	ULBS – Beneficiary Universitat Politècnica de València (ES) – Coordinator	HORIZON-INFRA-2025-01-TECH-04	Submitted 18.09.2025
4.	Words Matter: Speak UP against Hate (5 partners)	ULBS – Beneficiary Fundacja Edukacji Rozwoju i Innowacji – Coordinator	CERV-2025-CHAR-LITI	Submitted 18.09.2025
5.	AI Professional Education 4EU (6 partners)	ULBS – Beneficiary Smart Secure Network cluster (PL) – Coordinator	ERASMUS-EDU-2025-PI-ALL-INNO-EDU-ENTERP	NO
6.	Generative AI Bridge between EU and Africa (20 partners)	ULBS – Beneficiary Smart Secure Network cluster (PL) – Coordinator	HORIZON-CL4-2025-04-HUMAN-08	Submitted 02.10.2025
7.	Multi-Agent AI for Understanding and Countering Coordinated Information Attacks on European Media Ecosystems (32 partners)	ULBS – Beneficiary Universidad Europea de Madrid (ES) – Coordinator	HORIZON-CL3-2025-02-CS-ECCC-01	Submitted 12.11.2025

3.1. Institutional Capacity Building Through Internal Grant Competitions

Lucian Blaga University of Sibiu has established a robust internal grant competition framework that serves as a strategic instrument to strengthen institutional research capacity, encouraging interdisciplinary collaboration, and supporting early-stage innovation with tangible academic and societal outcomes.

Open to both established academics and early-career researchers, the scheme creates inclusive opportunities to explore new research directions, test innovative ideas, and develop proof-of-concept studies. By providing competitive seed funding, the program lowers entry barriers for emerging researchers while actively fostering cross-disciplinary team formation and exploratory collaboration, key drivers of knowledge transfer and institutional learning.

The central objective of the initiative is to promote scientific excellence, reflected in increased publication output in high-impact international journals. Each grant director is expected to publish at least one scientific article as lead or sole author in journals indexed in the Web of Science Citation Index Expanded, Social Sciences Citation Index, or Arts & Humanities Citation Index. These clear performance expectations reinforce a results-oriented research culture and contribute directly to institutional visibility and impact.

The annual internal calls support individual research projects, artistic creation, and performance excellence,

and are implemented through transparent, institutionally approved evaluation procedures. Applicants are encouraged to articulate well-defined research objectives, robust methodologies, and explicit impact pathways, embedding responsible research planning from the earliest stages of project development.

Beyond financial support, the program promotes accountability and quality by requiring participants to demonstrate anticipated outcomes related to scientific dissemination, knowledge transfer activities, and broader societal relevance. In this way, internal grants not only enhance institutional research performance but also empower young researchers to build independent academic profiles and strengthen their professional trajectories.

Importantly, this internal funding mechanism functions as a strategic bridge toward external funding. By enabling the generation of preliminary results and validated concepts, ULBS enhances proposal readiness across faculties and supports the transition from exploratory research to larger national and international projects.

Through sustained investment in internal grant competitions, ULB nurtures a supportive ecosystem for research-driven innovation and capacity building. By embedding publication targets, interdisciplinary cooperation, and impact expectations into its funding model, the university has created a coherent pipeline from early-stage ideation to externally funded initiatives, supporting sustainable research careers while

advancing its long-term commitment to scientific excellence and societal relevance.

4. ITC HPI-ULBS as Innovation Enabler

H. Etzkowitz and L. Leydesdorff first introduced the concept of “technology transfer” or “knowledge transfer centers” in the 1990s through the Triple Helix model, which emphasises collaboration between higher education institutions (HEIs), industry, and government. The knowledge transfer centers and industrial parks aim to stimulate innovation and economic development by translating university research into new products, commercial goods, and improved industrial processes, guided by government regulations and smart specialization strategies (Etzkowitz, 2016).

Section 4 aims to answer the following research questions: *RQ2: How is a knowledge transfer mindset cultivated among academic staff and students?* (detailed in 4.1 subsection), *RQ4: What is the role of the Knowledge Transfer Institute HPI-ULBS within the Quadruple Helix for boosting the regional innovation?* (detailed in 4.2 subsection), and *RQ5: How does ULBS integrate societal needs into research and innovation agendas?* (detailed in 4.3 subsection).

Formal mechanisms facilitating knowledge transfer at Lucian Blaga University of Sibiu include structured research and innovation projects, strategic partnerships

with clusters, industry, and public institutions (see section 4.2), and dedicated support structures for intellectual property, commercialization, and collaborative initiatives. These are complemented by internships, joint laboratories, lifelong learning programs, and initiatives of start-ups and spin-offs developments emerging from university research (see section 4.1), which connect academic expertise with practical applications. Together, these institutionalized processes ensure systematic dissemination, valorization, and societal impact of research and innovation outcomes.

Informal mechanisms facilitating knowledge transfer rely on interpersonal interactions, professional networks, and set new collaborative networks between academia and other stakeholders from the Quadruple Helix for accessing European and international funding programs (see section 4.3). Participation in conferences, both teaching staff and students (MSc, PhD), mentoring relationships, interdisciplinary openness and collaboration mindset, academic mobility (through Erasmus+ programs or FORTHEM³ Alliances support), and student involvement in applied research fosters the exchange of ideas, expertise, and best practices beyond formal structures. These interactions strengthen trust, stimulate interdisciplinary dialogue, and enhance ULBS visibility at the national and international level, and the knowledge transfer between the university, industry, and the broader community.

3 <https://www.FORTHEM-alliance.eu/>

4.1. Fostering Innovation Culture and Talent Development in Higher Education (RQ2)

Fostering an innovative culture in higher education requires creating dynamic environments and catalyzing actions, where students and researchers can actively develop and apply their skills. The Innovation Labs program, programming contests, and hackathons organized by ULBS during the Sibiu Innovation Day conference, summer schools (MAPIoT⁴, NEMO⁵, HiPEAC⁶), facilitated through different EEA and Erasmus+ projects or in collaboration with Sibiu IT clusters, shape the talent of the future. Participation in industrial workshops developed in collaboration with business partners (see Table 2) and scientific conferences—especially of MSc students and young PhD candidates—strengthens their research capacity and helps them to develop their own professional networks. Integrating MSc and PhD students into research and innovation projects⁷, alongside offering internships and placements, ensures practical experience and accelerates talent development aligned with real-world challenges. Figure 1 illustrates the summary of catalyz-

ers' actions promoted by ULBS for current students, the employees of tomorrow.

One key effect of 2025 in ULBS was the encouragement of students' entrepreneurship abilities, which increased the potential for new startups to be developed. Two important actions stand out for this: the Innovation Labs program and Hackathons from Sibiu Innovation Days (SID).

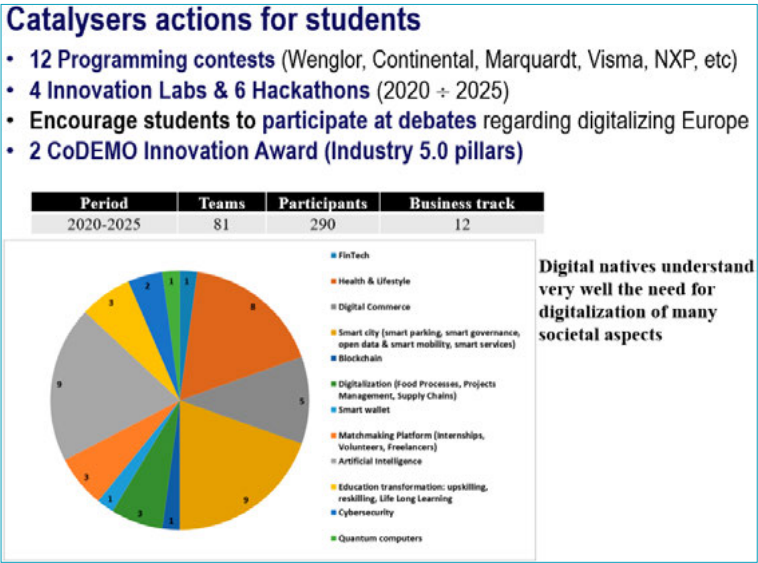


Figure 1: Future talent development actions

4 <https://digifof.omilab.ulbsibiu.ro/psm/content/mapiot/info?view=activities>

5 <https://nemo.omilab.org/>

6 <https://www.hipeac.net/acaces/2025/#/>

7 <https://www.ulbsibiu.ro/news/ulbs-a-lansat-o-noua-competitie-a-granturilor-de-excelenta-hasso-plattner-cu-un-buget-de-750-000e/>

Table 2: Industrial Workshops @Sibiu Innovation Days (2020 + 2025)

Year	Workshop topic	Industrial Partner
2020	AGVs and COBOTS	Continental
2021	Building Blocks for Autonomous Driving	Continental
2021	Innovation in Triad: Perfect Synergy of mechanics, electronics, and software	Marquardt
2022	How the Metaverse will influence Industrial Innovation	Continental
2022	Democar-innovation to touch experience the cockpit of the future, Diving into the secrets of Automotive Coding	Marquardt
2023	The path towards Autonomous Mobility and the technologies that make it possible	Continental
2024	Blockchain Education	MultiversX
2024	5.0 Value Co-Creation mechanisms and experimentations, Case studies	Marquardt & OMiLAB
2025	Introduction to Interacting with the MultiversX Network	MultiversX
2025	Meet CQ - a high-level imperative classical-quantum programming language	Leibniz Universität Hannover
2025	5.0 Value Co-Creation Mechanisms and Experimentations: Manufacturing Automation	Marquardt

The Innovation Labs⁸ acceleration program is a national university acceleration program for tech-based start-ups (generally start-ups based on IT solutions, software/hardware/applied engineering), early-stage(start-ups at the beginning of their journey), equity-free(start-ups do not give up shares in exchange

for the support program), and program offered free of charge. It is structured as a 3-month program of mentoring, technical and business support, presentation events, and media exposure. Starting in 2021, ULBS contributed to the Innovation Labs program with ambassadors aiming to promote Innovation Labs among

8 <https://www.innovationlabs.ro/>

local students/ doctoral students/researchers. For 2025, the KPI of an ambassador was to bring at least 3 teams to one of the hackathons in Bucharest, Cluj, Iași, or Timișoara, depending on the center where the ambassador's university is located. For the first time, ULBS was represented at the Innovation Labs competition in Bucharest by 8 teams, two of them („CyberAegis” and „Tecky”) qualified for the program's final Demo Day. The Tecky team won the award „Best Emerging Startup”. These are the fruits of collaboration between ITCHPI-ULBS and the Sibiu IT cluster to foster the young generation to develop their own startups.

At SID 2025, over 139 students participated in the three training industrial workshops, and 100 students competed in the Hackathon implemented together with the Sibiu IT cluster under the aegis of “Open Your Mind”. An important gain of this edition was the high number of participants in the Hackathon (100 in 2025 compared with 60 in 2024)–the programming competition for students that took place in the Faculty of Science, ULBS. In 2025, they were registered and competing against each other, 23 teams, including 100 participants from Sibiu, Cluj-Napoca, and Brașov, both from Colleges and Universities. All participants received gift bags from sponsors and EGLD from ULBS (obtained by sponsorship contract with MultiversX). The

winners of the first three places received substantial prizes from the Sibiu IT cluster. The most innovative project @SID2025 with applicability in one of the 3 sectors (Industry, Agriculture, or Health) that met at least 2 of 4 criteria specific to Society5.0 –Resilience, Digital, Green, and Human-centric received CoDEMO Innovation Award⁹. The students who won this award will participate in the international phase of the CoDEMO¹⁰ Innovation Award in Paris in 2026.

4.2. ITC HPI-ULBS within the Regional Innovation Ecosystem (RQ4)

The Knowledge Transfer Institute Hasso Plattner from Lucian Blaga University of Sibiu (ITCHPI-ULBS¹¹) was established by the ULBS Senate's decision no. 3473 from 26.07.2018, and is a structure under the Research, Development, and Innovation Support Service at ULBS, representing the main structural innovation enabler that shapes knowledge transfer processes. The management and administration bodies of the knowledge transfer center are the Board of Directors and the Scientific Council. The most important innovative activities carried out at the ITCHPI-ULBS covered the following aspects:

⁹ <https://shorturl.at/HanYD>

¹⁰ <https://www.codemo-project.eu/>

¹¹ <https://centers.ulbsibiu.ro/itchpiulbs/en/>

- developing projects with third parties to support BSc/MSc/PhD education,
- writing project proposals, especially European-funded projects (Horizon Europe, Digital Europe, EEA grants, ERASMUS+), some of them in collaboration with FORTH partners,
- implementation of new collaboration agreements and strategic partnerships between ULBS and companies,
- activities for promoting and popularizing the activities of the knowledge transfer institute and implicitly of the Sibiu University,
- patents granted and other activities related to Intellectual Property,
- participation of the director of the ICHPI-ULBS center in meetings with management of companies or representatives of the local administration to participate in joint projects and actions,
- organizing six editions (2020-2025) of the “Sibiu Innovation Days” conference.

Over more than 7 years of life, there were over 200 meetings of the ICHPI-ULBS manager with company leaders, and further collaboration activities were set. In each of these, collaboration and partnerships are in different phases according to Figure 2.

An important result in 2025 was the development of the first technological level maturity report for industrial partners. However, there is a reserved attitude by

companies (especially non-IT and small and medium enterprises) in the use of technology transfer services, due to the difficulty or cost of changing a technology or assembly line, or even due to a lack of trust in universities and research centers. We need to change this impression by developing new win-win collaborations in which we can work together and trust in each other (public-public or public-private partnerships), climbing together the stairway of evolutionary partnership.



Figure 2: Developing the university-industry partnerships and typical evolution in time

Launched in 2020 as an initiative of the Cluj IT cluster and supported by the Hasso Plattner Institute in Potsdam, Germany, Sibiu Innovation Days (SID) represented a necessity for Sibiu, for the university, for companies in the area, in the idea of bringing together of all decision makers that acts around the concepts of

digitalization, innovation and knowledge transfer to a smarter society and a better life for its members. Despite economic, geopolitical, and pandemic challenges, the path started in 2020 is irreversible. Sibiu Innovation Days has become and must remain a significant landmark on the Romanian innovation map, playing a crucial role in promoting collaborative networks between industry experts, public administration, and the academic research community. The ITCHPI-ULBS intends to become a strategic institutional center driving regional innovation, digital transformation, and applied research in Romania, particularly south of Transylvania. In the last few years, HPI-ULBS consolidated its role as a catalyst for academic-industry collaboration, delivering tangible results across prototyping, intellectual property, and research valorization with a profound impact on shaping the economic and social vitality of the entire region. Furthermore, innovation cannot be done alone but in collaboration for co-creation value. For Romania, which is in last place in the European Innovation Scoreboard (EIS) 2025 (European Commission, 2025), a change of mindset and a need for networking and exchange of good practices with academic and business partners from countries with a high degree of innovation are required.

Emerging technologies (Florea, 2024) such as generative AI, quantum computing, and sustainable computing are transforming industries, education, and society, offering significant benefits while also raising

ethical, security, and sustainability challenges. Generative AI creates new opportunities but also presents concerns related to ethics, intellectual property, workforce skills, and high energy consumption, highlighting the need for responsible and sustainable digital transformation. Quantum computing has the potential to revolutionize sectors such as health care, finance, and cybersecurity, while also requiring new encryption approaches and strategic investments at national and European levels, including in Romania. In this context, the Horizon Europe RECODEMLG project plays a crucial role by supporting the co-creation of digital and environmental policies and bringing together researchers, policymakers, industry, and civil society to address the societal impact of emerging technologies and enable the twin green and digital transition. At the same time, the rapid pace of technological change requires continuous curriculum modernization, upskilling, and lifelong learning to prepare students and employees for future challenges. Initiatives such as Sibiu Innovation Days further support knowledge exchange, innovation, and collaboration for sustainable and inclusive technological development. Debates on emerging technologies at Sibiu Innovation Days had a significant societal and educational impact by raising awareness of both the opportunities and risks associated with digital transformation, artificial intelligence, and sustainable technologies. These discussions fostered critical thinking, ethical reflection, and informed decision-making among

students, researchers, and stakeholders at ULBS and beyond. They also supported curriculum modernization, promoted responsible innovation, and strengthened the capacity of education and society to adapt to rapid technological change.

All efforts of ICHPI-ULBS were complemented by community engagement, with speakers at Sibiu Innovation Days, and ULBS partners working together in projects targeting society welfare, to reinforce sustainable and inclusive innovation. Sibiu Innovation Days facilitated networking with potential partners from academia, industry, and policymaking, which is essential for building competitive consortia for programs such as Horizon Europe and Digital Europe. Additionally, SID strengthened institutional reputation, promoted ongoing projects such as RECODEMLG, CoDEMO, and RIBES, and created opportunities for new collaborations that increase success rates in EU funding applications.

The measurable innovative outputs emerging from the event were:

- New national and international partnerships between ULBS and different stakeholders of the Quadruple Helix, and collaborations for next editions of Sibiu Innovation Days or for applying to calls for European funding.
- New teams for Innovation Labs, accelerating program to support start-ups.
- While highlighting contributions to ICHPI-ULBS to the development of the local innovation ecosystem, the Sibiu Innovation Days (SID) conference represented an important component in consolidating Sibiu City's position as an emerging innovation center. After SID2021, 19 IT companies from Sibiu joined forces and founded the "Sibiu IT Cluster". The SID2021 conference was the trigger for understanding the importance of association and collaboration for achieving higher goals compared to individual actions, showing the relevance of the event for the local IT business community. The "birth" of the Sibiu IT Cluster can be attributed to the sparkling discussions held by participants during SID2021. ULBS is one of the founding members of the Sibiu IT association and a member of the Cluj IT cluster.
- These sessions of Sibiu Innovation Days, held over 13 days, featured lectures, debates, and training sessions that included over 300 invited speakers (academic, business, local, and regional administration partners, as well as the European Commission), over 700 people who followed the conference onsite, and over 4,000 followers online. Over 10 ongoing European projects were disseminated.

Table 3: The main actions of ITC HPI-ULBS for boosting innovation

Actions developed in 2019-2026 at ULBS with the support of HPI Potsdam	Number
Developing the ULBS Design Thinking school and starting the first activities. Connecting with Global Design Thinking Alliance ¹² , managed by HPI Potsdam.	1
Organizing conferences to increase the visibility of KTC HPI-ULBS: SID ¹³	6
Hackathons / Innovation Labs	10
Meetings with companies: set further collaboration activities	200+
Scientific papers based on ITC HPI-ULBS activities	12+
Patent applications	30+
Providing services for collaborative projects with companies	35+
Investments in R&D grants for building capacities	10+
Investments in the infrastructure of existing research centers/create new ones	22
Providing educational and vocational training	15+
Themes of applied research developed through KTCHPI-ULBS in collaboration with companies (BSc, MSc thesis)	50+
Partnerships with Digitalization HUBs and IT professional cluster	3

12 <https://gdta.org/about-us/member-institutions/#1600250243638-b971147b-bfb5>

13 The Sibiu Innovation Days 2025 – <https://events.ulbsibiu.ro/innovationdays/>

4.3. Embedding Societal Needs in ULBS Innovation Activities (RQ5)

ULBS implements the following activities to integrate societal or economic needs into its research and innovation agenda.

- Stimulating researchers of ULB to write project proposals in collaboration with third parties (of common interest).
- Developing themes of applied research through ITCHPI-ULBS in collaboration with companies to support BSc/MSc/PhD education.
- Stimulating ULBS staff to do training activities for companies.

Figure 3 illustrates a few of the European projects implemented by ULBS with private companies and industrial clusters developed under the supervision of ITCHPI-ULBS. The topics were interdisciplinary, starting from the industry 5.0 and factories of the future (DigiFoF¹⁴) which requires smart, skilled and secure workforce(EoFSSS¹⁵), to agriculture which should be

modernized through robotics, AI and IoT (MAPIoT¹⁶) or needs developing governance and business models to propel underdeveloped regions from stagnation to a circular economy, fostering innovation, sustainability, and rural development (RIBES¹⁷). Emerging technologies like quantum are introduced by projects that aim to approach and mitigate major challenges raised by the digital era, like secure communication and enhanced computing capability based on the laws of quantum physics (RONAQCI¹⁸). The other two projects aim to introduce the co-creation concept both in the decision-making process of 5.0 organizations (CoDEMO¹⁹) and in monitoring of how the transition to a sustainable and digital future can be governed effectively and democratically within the EU multilevel governance system (RECODEMLG²⁰).

4.4. Research Centers and Scientific Journals: Pillars of Knowledge Creation and Dissemination at ULBS

Within its broader strategy of strengthening knowledge transfer and research excellence, Lucian Blaga Univer-

14 <https://www.digifof.eu/>

15 <https://www.erasmus-v.ssnetworks.eu/news>

16 <https://digifof.omilab.ulbsibiu.ro/psm/content/mapiot/info>

17 <https://ribesproject.eu/>

18 <https://digifof.omilab.ulbsibiu.ro/psm/content/ronaqci/info>

19 <https://www.codemo-project.eu/>

20 <https://recode-mlg.eu/>

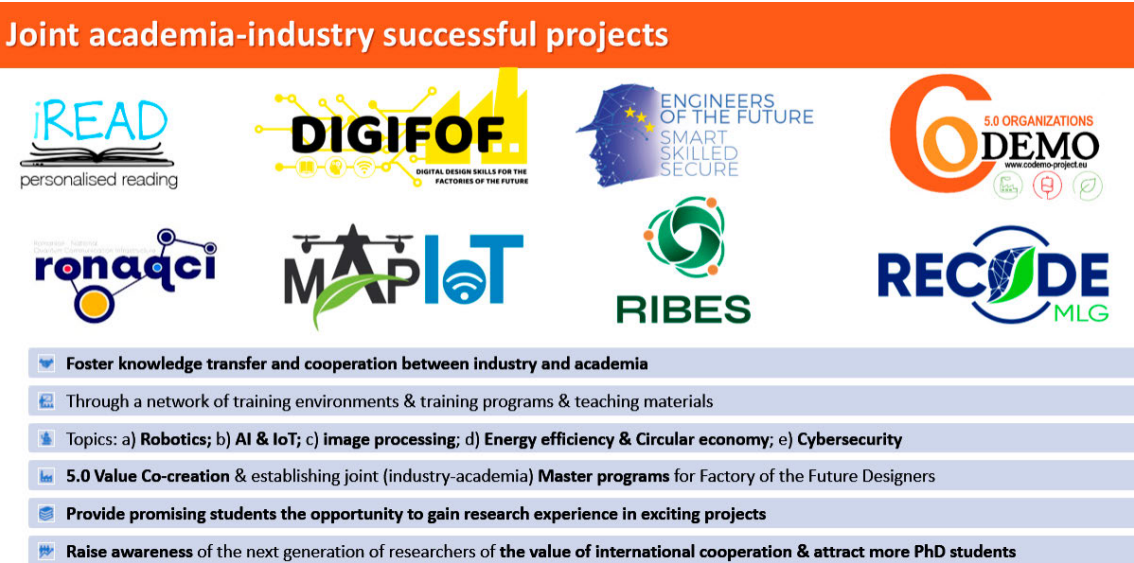


Figure 3: Implemented European projects by ULBS with private companies & industrial clusters

sity of Sibiu has developed a comprehensive research infrastructure anchored in a network of 24 interdisciplinary research centers and a portfolio of 24 institutionally supported scientific journals. Together, these structures form a core pillar of the university's internal knowledge ecosystem, supporting both knowledge creation and its systematic dissemination.

4.4.1. Research Centers as Engines of Interdisciplinary Collaboration

The 24 ULBS Research Centers provide organized environments for thematic and interdisciplinary research,

bringing together academic staff, early-career researchers, and doctoral candidates around shared scientific objectives. These centers support both applied and fundamental research across diverse fields, encouraging cross-faculty collaboration and fostering connections with external stakeholders, including industry partners and public institutions.

By offering dedicated frameworks for project development, experimentation, and knowledge exchange, the research centers function as incubators for innovation. They enable teams to stop piloting new ideas, generate preliminary results, and develop collaborative projects that can later be scaled through national

and international funding schemes. Importantly, the centers also contribute to capacity building by mentoring young researchers, supporting doctoral work, and facilitating participation in collaborative networks, strengthening ULBS's role within regional and European research ecosystems.

Through this structure, ULB promotes a culture of shared expertise, interdisciplinary dialogue, and responsible research planning, ensuring that knowledge creation remains closely connected to societal needs and emerging challenges.

4.4.2. Institutional Journals as Vehicles for Knowledge Transfer

Complementing its research centers, ULBS maintains a portfolio of 24 peer-reviewed scientific journals covering multiple academic domains. These publications provide structured channels for disseminating research results, supporting early-stage researchers in developing publication experience, and increasing the international visibility of institutional scholarship.

The ULBS journals contributed directly to the university's knowledge transfer by transforming research outcomes into accessible scientific contributions. They serve as platforms for the dialogue between disciplines and support the dissemination of locally generated knowledge to wider academic audiences. For young researchers in particular, these journals represent im-

portant entry points into scholarly publishing, reinforcing academic writing skills and fostering research independence.

Together with publication requirements embedded in internal grants schemes, the journals help sustain a results-oriented research culture focused on quality, visibility, and impact.

4.4.3. Integrating Infrastructure into a Knowledge Transfer Ecosystem

By strategically aligning its 24 Research Centers with its 24 scientific journals, ULB has created a coherent internal ecosystem that supports the full research lifecycle—from idea generation and interdisciplinary collaboration to publication and dissemination. This integrated approach strengthens institutional capacity, supports sustainable research careers, and ensures that academic outputs contribute meaningfully to scientific advancement and societal development.

As best practice, the ULBS model demonstrates how universities can leverage internal structure to embed knowledge transfer into everyday research activities. Through coordinated investment in research environments and publication platforms, ULBS reinforces its commitment to excellence, collaboration, and impact—key foundations in building a lasting culture of knowledge transfer.

5. Fostering Creativity and Entrepreneurial Mindsets through Design Thinking at ULBS (D-School)

In this section, we try to answer the third research question (RQ3) stated in the Introduction, namely *What role do design thinking and entrepreneurial education play in fostering innovation culture?*

ULBS places strong emphasis on cultivating creativity, entrepreneurial thinking, and human-centred innovation among students and researchers. Through its D-School initiatives, ULBS introduces Design Thinking methodologies that encourage problem-solving, experimentation, and reflective practice, positioning Design Thinking as both a pedagogical approach and a knowledge transfer mechanism.

All Design Thinking activities at ULBS are intentionally designed around four core pillars:

- multidisciplinary teams,
- creativity-supportive spaces,
- a process tailored to the specific challenge,
- skilled facilitation to guide teams through the methodology.

As a comprehensive university with nine faculties, ULBS benefits from a strong interdisciplinary foundation, enabling students and researchers to collaborate across domains. The remaining pillars are supported

through the expertise of the D-School facilitator and access to flexible learning environments. While the ULBSD-School space is typically used for workshops with up to ten participants, larger cohorts are accommodated in the university library or Smart Hub. Regardless of venue, participants are organised into small teams of four to six members, each ideally supported by a coach or Design Thinking facilitator.

Design Thinking methodologies are delivered in multiple formats, adapted to the needs of students and researchers. Three repeatable models have emerged as institutional best practices:

1. Design Thinking Semester Courses
 - Format: 10-14 weeks with one two-hour meeting per week;
 - Challenges: Making courses more interactive for students, improving waste collection in the university, building a user-friendly app for students, etc.
2. Design Thinking Bootcamps or Summer Schools
 - Format: 5 days with 6 to 8 hours of activities every day
 - Challenges: same as for semester courses, but usually challenges where there is some pre-existing knowledge or a volunteer group to call for interviews or observed during the initial stages of the design process.

3. Design Thinking workshops or activities are requested through the *Unlock Design Thinking Initiative*.
 - Format: flexible (depending on what students or researchers need)
 - Challenges: provided by the students or researchers through a Google Form in which they provide some details about what they need, and the facilitator proposes a workshop design or activity to help them collect data or collaboratively receive feedback.

Building on this ecosystem, ULB has piloted two complementary good practices that strengthen reflective learning and applied innovation: the Knowledge Transfer Log and the Design Thinking Bootcamp.

5.1. The Knowledge Transfer Log: Making Learning Visible

Inspired by the Decision Log used by HPI d.school, the Knowledge Transfer Log (KTLog) was developed as a practical reflection tool to capture how knowledge is created and exchanged during workshops.

The KT Log invites participants to document their experience using four guiding prompts:

- Something I learned
- How I learned it
- Something I shared
- How I shared it

These columns encourage structured reflection on both knowledge acquisition and contribution. Dedicated reflection moments are embedded into workshops, allowing participants to record insights digitally (via collaborative platforms such as Miro) or physically using post-it notes. Participants are also encouraged to capture spontaneous learning moments throughout the activity and add them to the log as they arise.

The primary objective of the KTLog is to visualize collective learning while increasing awareness of knowledge transfer mechanisms. Beyond workshops, it serves as a lightweight tool for research teams to capture ideas and document emerging best practices.

The KTLog was first implemented during a ULB event in March 2024. In a single reflection activity, five participants contributed ten entries, demonstrating active engagement. Feedback was positive, and the company providing the workshop challenge expressed interest in adopting the tool internally. Due to its simplicity, the KTLog is highly reproducible and adaptable for both online and face-to-face formats.

5.2. Design Thinking Bootcamp: Bridging Research and Practice

Complementing this reflective approach, ULBS also organised a Design Thinking Bootcamp centred on a real-world challenge proposed by an IT company. The boot camp was structured around four essential elements: interdisciplinary participation, creativity-sup-

portive environments, challenge-specific process design, and experienced facilitation.

The bootcamp provided participants, primarily PhD researchers, with hands-on exposure to Design Thinking, while introducing them to industry knowledge transfer practices. Researchers collaborated directly with company representatives to generate ideas for future testing, strengthening connections between academic inquiry and practical application.

Preparation involved careful company selection and two preliminary meetings to define a challenge appropriate to the available timeframe. The facilitator then designed the learning journey using selected tools from the Design Thinking toolbox. By implementation, flexibility proved essential, as logistical constraints and evolving agendas required continuous adjustment.

Although participant numbers were modest, qualitative outcomes were significant. Researchers reported gaining methodological skills and practical insights applicable to their doctoral work, while the company benefited from fresh perspectives and structured innovation dialogue. The experience demonstrated how Design Thinking can support user-centred outcomes and facilitate the translation of research into practice.

This model is readily transferable to other higher education contexts, provided skilled facilitation is available. As a knowledge transfer format, the Design Thinking Bootcamp illustrates how collaborative, challenge-driven learning can enhance both academic development and industry innovation.

6. Ecosystem Engagement and Regional and International Impact

6.1. Researchers Night. Bringing Science Closer to Society

Lucian Blaga University of Sibiu actively advances public engagement and knowledge transfer through its long-standing implication in Researchers' Night, a large-scale European initiative designed to connect research with society. Delivered directly by ULBS research teams, the event reflects the university's sustained commitment to dialogue between academia and the wider community, transforming scientific knowledge into accessible, interactive experiences for audiences of all ages.

Each edition is developed through a continuous improvement approach, with organisers building on previous outcomes to expand both the scope and quality of activities. The program brings together technical demonstrations, hands-on experiments, exhibitions, competitions, creative performances, and educational workshops that highlight the diversity of disciplines represented at ULBS. Researchers present laboratory-developed experiments and showcase findings from university research centers, offering visitors a rare behind-the-scenes perspective on academic work.

By 2026, ULBS had organized twelve editions of Researchers' Night in Romania. The first editions (2014–2015), supported by the European Commission

through Horizon 2020, focused on promoting research careers and enabling direct interaction between researchers and the public. Since then, the initiative has grown into a flagship outreach event, engaging over 500 teachers and students annually alongside business partners and volunteer teams from both university and pre-university education.

Participation levels demonstrate strong community resonance: each year, an estimated minimum of 14,000 visitors from Sibiu County attend activities in person, while more than 30,000 individuals are reached through online communication, media coverage, and promotional campaigns. The quality and impact of the programme have been repeatedly recognized, including multiple Best Youth Project awards (2017, 2019, 2022) and distinctions for contributions to the European Green Deal objectives (2021) and for fostering rural–urban partnerships and multi–annual youth engagement (2023).

Researchers' Night plays a strategic role in ULBS's knowledge transfer ecosystem by:

- supporting STEAM education through hands-on learning experiences,
- showcasing local cultural heritage via workshops exploring regional traditions,
- strengthening partnerships between universities, public institutions, businesses, and communities,
- sparking curiosity in science, culture, and technology through direct interaction with researchers.

These objectives align closely with the values promoted by Marie Skłodowska-Curie Actions, emphasising excellence, openness, and societal engagement.

The initiative also contributes to educational guidance and regional development by introducing young people from Sibiu and the surrounding areas to the city's research, educational, and cultural infrastructure. High school students, potential future undergraduates, are offered direct exposure to university life, supporting informed study choices and encouraging educational tourism.

Researchers' Night was implemented as a partnership-driven model, relying on collaboration among academic staff, partner institutions, business representatives, cultural organizations, local authorities, and the pre-university education network. Activities extend into rural communities and small towns, where local councils, schools, and parishes co-create workshops adapted to local needs. These include exhibitions of restored material heritage, creative sessions focused on disappearing crafts, and science-oriented activities tailored for primary and secondary pupils.

The program itself is highly diverse, ranging from robotics demonstrations, virtual reality experiences, and 3D printing showcases to chemistry and physics experiments, environmental research presentations, entrepreneurial workshops, language labs, historical reenactments, and basic life support training delivered by emergency professionals. Humanities faculties contribute exhibitions and round tables, revisiting key

figures in Sibiu's cultural history, while science faculties present research conducted in protected natural areas and international collaborations.

Under the motto "Discover the Magic of Science", Researchers' Night has become one of Sibiu's most anticipated autumn events, coinciding with the start of the academic year and offering inspiration to young people at pivotal moments in their educational journeys.

As a best practice, Researchers' Night illustrates how sustained public engagement can strengthen trust in science, promote research careers, and embed knowledge transfer into the social fabric of a region. Through this initiative, ULB demonstrates how universities can act as open hubs of learning, connecting research excellence with community impact and cultural development.

6.2. Strategic Outreach and Regional Collaboration with the Sibiu IT Cluster

Lucian Blaga University of Sibiu has established a strong collaborative partnership with Sibiu IT Cluster, creating a dynamic interface between academia, industry, and regional stakeholders. This cooperation is rooted in shared objectives related to digital transformation, sustainability, skills development, and community engagement, and is reinforced through a portfolio of outreach initiatives that actively connect students, researchers, companies, and public authorities.

Through joint activities, ULBS and the Sibiu IT Cluster promote knowledge exchange and applied innovation by bringing academic expertise into direct dialogue with real-world challenges. These efforts are complemented by cooperation with regional authorities and local actors to support sustainable development and cultural vitality, helping align educational and research agendas with broader regional priorities.

A key element of this collaboration is the co-creation of experiential learning formats. Events such as Hackathon Open Your Mind provide interdisciplinary teams of students, researchers, and professionals with opportunities to tackle societal and technological challenges in an intensive, innovation-driven setting. These hackathons foster creative problem-solving, entrepreneurial thinking, and rapid prototyping, while strengthening ties between academia and the local digital economy.

Capacity building is further supported by initiatives like the IT Summer School, which offers hands-on learning experiences in emerging technologies and digital skills. By engaging industry experts alongside academic staff, the program helps participants develop practical competencies while gaining insight into current market trends and professional pathways.

Entrepreneurial development is encouraged through the Sibiu Startup Hub, a platform that supports early-stage innovators and aspiring founders with mentorship, resources, and community networking. ULBS contributes to this ecosystem by connecting students

and researchers with startup opportunities, reinforcing a culture of innovation and knowledge valorisation.

Together, these initiatives illustrate how university-cluster partnerships can extend beyond traditional knowledge transfer. By embedding outreach activities, regional cooperation, and experiential learning into their collaboration model, ULBS and the Sibiu IT Cluster actively promote sustainability, digital transformation, and cultural development. The partnership also plays an important role in career development and lifelong learning, offering students and early-career researchers direct exposure to industry practices while providing companies access to academic talent and research-driven perspectives.

Through this integrated approach, ULB and the Sibiu IT Cluster foster an inclusive regional innovation environment, strengthen research-to-practice pathways, and contribute meaningfully to the socio-economic development of the Sibiu region.

6.3. Strategic International Partnerships and Innovation as Drivers of ULBS Internationalization

6.3.1. International Partnerships Expansion and Strategic Global Engagement

Over the last few years, Lucian Blaga University of Sibiu has significantly strengthened its internationalization trajectory through the consolidation and expansion of

its global partnership network. This process was driven by a strategic vision aimed at increasing the university's international visibility, fostering academic collaboration, and supporting the development of joint educational and research initiatives. As a result of sustained institutional efforts, ULBS maintained a diversified portfolio of more than fifty inter-institutional agreements covering Europe, Asia, North and South America, and Africa, with particular emphasis on strengthening relationships in emerging and strategically relevant regions such as Asia, South America, and Africa.

This expansion was facilitated through active participation in major international academic conferences and fairs, which provided valuable opportunities for institutional dialogue, academic diplomacy, and the establishment of new partnerships.

In parallel, ULBS strengthened its Erasmus+ partnership network, reaching, for this period, 366 bilateral agreements with European universities and 126 agreements with non-European partner institutions. This significant growth reflects both the attractiveness of ULBS as an international academic partner and the institutional commitment to expanding opportunities for academic mobility, joint teaching, and collaborative research.

6.3.2. Innovation and International Collaborative Ecosystems through FORTHM Alliance

Innovation plays a central role in ULBS's internationalization strategy, particularly through its active par-

participation in the European University Alliance for the Future. This alliance provides a dynamic collaborative framework that promotes interdisciplinary research, academic innovation, and institutional integration across European higher education systems.

One of the most relevant examples of innovation-oriented international collaboration was the organization of the FORTHEM Coliberator Summit–Smart Storage & IoT, an international hackathon hosted by ULBS. This event brought together students from partner universities to develop Internet of Things solutions aimed at improving agriculture storage processes, contributing to sustainability and technological advancement. By applying the “learning by doing” approach, participants engaged in practical innovation processes, demonstrating the university’s capacity to foster applied research and real-world problem-solving in an international context.

In addition, the FORTHEM Researcher Grand Prix hosted in 2025 provided an international platform for doctoral students to present their research to a global academic audience, facilitating knowledge dissemination and strengthening the visibility of ULBS research internationally. Such initiatives contribute to the development of innovative ecosystems by connecting researchers, students, and academic institutions in collaborative networks.

Through the FORTHEM Alliance, ULBS also hosted international summer schools, workshops, and training activities focused on sustainability, civic engagement,

and interdisciplinary research. These initiatives promote academic creativity, support the development of innovative competencies, and foster collaborative research addressing global societal challenges.

6.3.3. Knowledge Transfer through Mobility and International Academic Exchange

International mobility represents a fundamental mechanism for knowledge transfer within ULBS’s internationalization strategy. In 2025, for example, the university recorded substantial participation in Erasmus+ mobility programs, with 349 outgoing student mobilities and 179 incoming mobilities, alongside extensive teaching and staff mobility exchanges. These mobility flows created valuable opportunities for academic exchange, enabling the transfer of knowledge, teaching methodologies, and research practices between institutions.

Blended Intensive Programs (BIP) also played a key role in facilitating innovative learning and knowledge exchange. These programs, developed in collaboration with partner universities across Europe, provided students and academic staff with opportunities to participate in interdisciplinary educational activities, covering fields such as engineering, information technology, social sciences, and international relations. Through these collaborative formats, participants benefited from exposure to diverse academic perspectives and innovative teaching approaches.

Furthermore, ULB implemented interdisciplinary academic modules delivered in international languages, designed to support incoming students and foster international knowledge dissemination. These programs contribute to the development of global competencies among students while enhancing the university's role as a hub for international academic exchange.

ULBS further strengthened its innovation and research capacity via participation in international research and educational projects funded under Erasmus+ and Horizon Europe programs. Notable initiatives include cooperation projects KA220, such as Circular Urban Fashion: Europe's Inclusive Renaissance and Competence Model for Youth Leaders, which promote innovation in education, sustainability, and social development.

6.3.4. Institutional Innovation and Capacity Building for Internationalization

The internationalization trajectory of ULBS has been supported by continuous institutional innovation and capacity-building initiatives designed to strengthen the university's ability to operate in an international academic environment. Training programs in intercultural communication were implemented to enhance staff competencies and improve collaboration with international partners.

In addition, ULB introduced innovative communication and integration tools, such as digital promo-

tional campaigns and dedicated support services for international students, contributing to the creation of an inclusive and globally connected academic environment. The establishment of dedicated FORTHEM information spaces within university faculties further facilitated access to international opportunities and promoted international engagement across the academic community.

The OpenE+ project represents another important innovative approach in supporting internationalization, focusing on increasing access to international mobility for students with fewer opportunities and promoting inclusive participation in international academic exchange. This initiative supports the development of global competencies and contributes to equitable knowledge transfer.

7. Conclusions and Further Work

Clusters, universities, and research institutes must work together more to position themselves as strategic driver of digital innovation, research excellence, and international collaboration, strengthening the institutional capacity of Lucian Blaga University of Sibiu to engage in high-impact European initiatives. In parallel, Sibiu Innovation Days acts as a flagship platform for knowledge exchange, fostering interdisciplinary dialogue, showcasing research results, and connecting Academia with industry, policymakers, and society. Together, ITCHPI-ULBS and Sibiu Innovation Days contribute

significantly to enhancing innovation culture, increasing international visibility, and supporting the region's transition toward a sustainable, knowledge-based, and digitally advanced ecosystem.

Two important directions will be followed by ICH-PI-ULBS in the near future: a) improving the educational quality at high school and university, and b) creating research opportunities and communities in digital and technology areas. If we do that, we could help the Sibiu community become a relevant innovation driver in the long term. Maybe we can, through a joint effort with HPI or other stakeholders, and the Sibiu-IT cluster, “clone” more of the European best practices and programs to Sibiu and make ULBS the extended workbench of innovation in Romania, boosting territorial innovation in our country. We will invest more in the visibility and sustainability of the ITCHPI-ULBS knowledge transfer center by developing research and innovation projects for the Sibiu community and increasing local and regional visibility of ULBS/ITCHPI-ULBS by connecting ecosystems and boosting territorial innovation.

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CHAPTER 5

CO-CREATION APPROACHES IN THE BLUE ECONOMY VALUE CHAIN FOR LOCAL SECTOR DEVELOPMENT

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1. Multi-helix collaboration for the sustainable blue economy transition

This chapter highlights the strategic importance of co-creation and participatory approaches in promoting the sustainable development of local blue economy value chains. The proposed framework illustrates how integrating stakeholder engagement, social innovation, and technological advancement can strengthen governance systems, improve local capabilities, and promote environmentally and socially responsible practices. In this broader perspective, the blue economy, driven by the adoption of circular models and the enhancement of marine resources, is a key sector in achieving

the United Nations' Sustainable Development Goals (SDGs) globally by 2030 (Aprizal et al., 2025; Masi et al., 2025; Li et al., 2025). In this context, the active and effective engagement of stakeholders across blue economy sectors is essential for advancing the blue transition, which constitutes the core framework of the FAO Roadmap for the Blue Transition (Aprizal et al., 2025; Masi et al., 2025). A participatory and co-creative approach is therefore appropriate for ensuring the sustainable use of marine resources and promoting economic development (Phoebe et al., 2026).

Co-creation is a collaborative methodology that brings together diverse stakeholders to share knowledge, perspectives, and resources to develop innovative

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solutions and sustainable growth for products, experiences, and services. In this process, the role of the participant is prioritised over that of the single expert, ensuring outcomes responsive to real-world needs (Durugbo and Pawar, 2014). The co-creative strategy was applied by the Department of Earth and Marine Sciences (DiSTeM) at the University of Palermo, thanks to its involvement in several projects aimed at supporting the development of a circular and sustainable local blue economy. This result was achieved by involving key regional stakeholders, enabling a more comprehensive understanding of how to identify and support activities that foster the blue economy at the local level, contributing to the definition of strategic and actionable guidelines for the sector. Specifically, in collaboration with the Agency for the Promotion of European Research (APRE), the co-creation was applied in two Horizon Europe projects (“Engage4BIO - Better understanding, intensified engagement, training and development in regional bio-based systems” - Proposal number: 101059565; and “BlueRev - Revitalisation of European local communities with innovative business models and social innovation in the blue bio-based sector” - Proposal number: 101059565). Furthermore, since this method represents a fundamental part of the FORTHEM Alliance’s mission, as it aims to enhance participants’ creativity and encourage them to approach challenges from multiple perspectives, this approach was used in the FORTHEM Food Science Lab, in collaboration with the Diversity and Migration

Lab. Both laboratories, which are based on a methodology of co-creation and interdisciplinarity, actively involve students from the nine FORTHEM Alliance universities and co-produce knowledge with local and institutional actors. The Food Science Lab addresses social challenges related to food systems, production, nutrition, health, and sustainability. The integration of food, sustainability, and diversity issues contributes to the development of innovative solutions capable of generating social impact, consolidating regional networks, and promoting a model of an open, inclusive European university focused on global challenges. In this context, the interaction between Mediterranean food, migrant cultures, and the identity of places was examined in the Sicilian region with the aim of developing concrete strategies to promote coexistence, integration, and valorization of the heritage involved.

The participatory method adopted played a decisive role in transforming fragmented insights into a shared and actionable strategic framework through various actions linked to the blue bioeconomy. This applies to all projects and laboratory sessions. The approach, that was adopted at local level in Trapani area (Sicily, Italy), was built on a participatory approach (stakeholder engagement), by involving the participation of three/four-helix actors (academia, industry, public authorities and civil society) and the associated supply chains, whose active engagement is essential for the development of the regional blue economy, integrating co-creation and design thinking principles. The aim was to raise col-

lective awareness of the blue and circular economies, while stimulating the preparatory actions necessary for the implementation and the strengthening of networks between all stakeholders involved. The co-creative workshops fostered an inclusive and participatory environment for stakeholders, facilitating effective knowledge sharing, enhancing collaboration, strengthening governance dialogue, and reinforcing capacity-building initiatives. This approach, which included several methods combining innovative methodologies, workshops, and events to promote awareness of the blue economy, provided a space for stakeholders to engage in co-creation processes, highlighting the importance of participatory approaches in shaping sustainable and inclusive strategic guidelines for the development of the local blue economy sector. During the co-creation activities, the potential for valorizing marine co-products into high-value products was emphasized. From the perspective of strengthening the blue economy, valorizing marine co-products into high-value products can promote economic growth, foster social cohesion, generate positive environmental impacts, and integrate local resources, community knowledge, and diverse social, economic, and cultural perspectives. In addition, the ToxiCOIL programme, which brought together students from the Universitat de València (Spain), the Institut Agro Dijon - Université de Bourgogne Europe (France), and the University of Palermo (Italy), within the FORTHEM Alliance, was designed as part of international educational programmes leveraging the

Collaborative Online International Learning (COIL) framework, an innovative model of virtual collaboration between students and teachers from different universities. In this model, instructors co-design and co-teach the modules, while students work together to achieve shared outcomes. The ToxiCOIL programme, which applied COIL to Food Safety and Toxicology Challenges, demonstrated how international collaborative learning can address real-world challenges in food safety, toxicology, and health sciences.

2. From co-creation to action

The co-creation approach fostered inclusive dialogue and enabled stakeholders to collectively define priorities and opportunities for action within the local blue economy. Furthermore, strengthening the network among various stakeholders facilitated the development of awareness of the potential of innovative bio-based products from the sea. This has promoted actions aimed at the sustainable use of marine resources at the regional level, contributing to local environmental and social sustainability. In particular, the activities implemented include:

2.1. Educational and training initiatives to support communities in the blue economy

The co-creative approach was translated into action through training initiatives dedicated to adult citizens,

operators in the productive sectors, new emerging professional figures, and students. In particular, training courses have been designed in person and online, for local secondary school teachers, students, and enterprises to transfer scientific know-how into educational programmes and foster the development of specialised technical skills that enhance job opportunities and support small-scale enterprises in the bio-based sector. This approach can revitalise local communities and strengthen the local bio-based economy within the broader blue economy transition. Within this framework, educational innovation was further strengthened through international collaborative initiatives. During the second edition of ToxiCOIL (2024–2025), led by Professor Ana Juan-García (University of Valencia) and involving 40 students enrolled in nutrition, pharmacy, and food technology degree programmes, participants worked in mixed international teams to analyse food safety systems, regulatory frameworks, and preventive measures across countries. They also developed innovative project ideas addressing food safety challenges, fostering problem-solving, entrepreneurial thinking, and the creative application of scientific knowledge. This collaborative experience strengthened intercultural competence, teamwork, critical thinking, and provided insights into global perspectives on food safety, health, and environmental sustainability.

These educational and training initiatives complement local training efforts, reinforcing capacity building and equipping students with competencies essential

for innovation, sustainable resource management, and resilient development in the blue economy. By combining co-creation approaches, interdisciplinary training, and intercultural exchange, these programmes contributed to strengthening the skills and networks needed to support innovation, sustainable resource management, and the long-term development of resilient blue economy value chains.

2.2. Creative approaches for blue economy awareness

Art and design were used as facilitating tools to foster connections, shared visions, and the creative application of best practices, enabling the development and implementation of awareness-raising and communication campaigns, to formulate a new vision and strategic approach aimed at raising awareness and strengthening the regional blue economy network. Conferences, shows, and knowledge exchanges between scientists and artists have been designed and implemented to raise awareness of the natural heritage of our seas and promote significant societal change that can enhance these precious resources. An immersive sound installation, a participatory artistic performance, a video installation and exhibition, and a consumer testing session of new sustainable marine bio-based food products were implemented, actively engaging participants throughout the process. The promotion of resource use and reuse, as well as the sustainable consumption of fish

species, was promoted through the development and dissemination of artistic campaigns grounded in an innovative participatory design approach. This process involved participants directly in generating ideas and co-designing concepts that addressed key themes related to the blue economy, the circular economy, and the zero-waste approach, thereby strengthening awareness and encouraging more responsible consumption practices.

2.3. Participatory approaches to governance and business innovation in the blue economy

Strategic guidelines were developed to promote local adoption of innovative marine bioeconomy practices through a governance model based on the 3Ps framework (People, Planet, Profit), providing a strategic roadmap for the sustainable development of the local blue economy. Stakeholders implemented new regional, sustainable, and transferable solutions for local blue growth by promoting innovative bio-based businesses, new governance models, and social innovations within the blue economy sector. To improve governance through the application of new model systems by promoting dialogue, raising awareness, and providing key information, a Living Lab and a Community of Practice were designed and implemented to enable stakeholders at all levels to contribute to a more sustainable and resilient management of marine resources. Alongside these initiatives, pilot experience

was implemented to explore sustainable and innovative value-chain approaches, with a particular focus on the valorisation of fisheries by-products into value-added products. Specifically, new sustainable business models were developed to revitalize coastal communities through the production of health-oriented and environmentally responsible products. These included the extraction of high-value bioactive compounds from fish by-products for applications in the pharmaceutical and cosmetic industries; the valorization of low-value or underutilised fish species into high-quality food products; and the transformation of processing by-products into high-value compounds, thereby fostering circularity and enhancing the economic and environmental performance of the fisheries sector.

Overall, these actions highlighted the role of collaborative efforts, shared learning, and social innovation in encouraging blue bioeconomy stakeholders to adopt socially and environmentally responsible behaviors and in supporting more sustainable maritime and coastal communities. The insights gathered from the co-creation workshops helped support the development of practical models in line with stakeholder expectations and the goals of the European Union circular economy, provided opportunities to minimize waste, enhance resource efficiency, and create new profit streams. The co-creative approach adopted underlines the importance of fostering dialogue among academia, industry, public authorities, and civil society to overcome fragmentation and support the transition towards circular

and resilient blue bioeconomy models. In particular, the valorization of marine by-products emerged as a promising pathway to reduce waste, enhance resource efficiency, and create new economic opportunities while preserving the marine ecosystem. The experience confirmed that integrated and transferable co-creation frameworks can effectively support local and regional blue economy development. Such approaches can contribute to long-term socio-economic resilience, capacity building, and innovation, providing a replicable model for sustainable growth in coastal and maritime communities.

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CHAPTER 6

DIGITALIZATION OF EDUCATION

Hopes and Fears of Adoption of Artificial Intelligence and Digital Technologies

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1. Introduction & Concept

The digital transformation of education constitutes one of the most profound structural changes of the 21st century, reshaping the ways in which knowledge is produced, transmitted, and consumed. This book chapter presents the results of a comprehensive international survey designed to examine the complexity of the digitalization of education from an interdisciplinary perspective. The findings reveal a multifaceted picture of how young Europeans, pupils over 18 years of age and higher education participants, make use of digital technologies, and particularly of artificial intelligence tools, in their education. The empirical results are structured

around three thematic axes: the frequency of using digital technologies for learning purposes and the nature of the adoption of AI-based tools in the education process, the preferred balance between digital and traditional forms of learning, and their expectations and concerns regarding the future of educational technologies.

The structure of the chapter is as follows. Section 2 presents the theoretical and contextual background, situating the digitalization of education within the broader framework of technological, institutional, and socio-economic transformations. Section 3 describes the research methodology, including the construction of the cross-national survey instrument, the sampling strategy, and the analytical approach employed.

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Section 4 presents empirical findings, organized along three thematic axes: (i) the frequency of the use of digital technologies and the nature of the adoption of AI tools for learning purposes; (ii) respondents' preferred balance between digital and traditional forms of education; and (iii) their expectations and concerns regarding the future trajectory of educational technologies. Section 5 discusses the results from a comparative perspective, highlighting cross-national patterns and their implications for public policy. The chapter concludes with a summary of the key findings and an indication of directions for further research.

2. Interdisciplinary background of digitalized education

2.1. The right to education

Currently, education seems to be a basic human right, but it took ages to make rulers understand that an educated society guarantees faster economic development. Within the European Union, the Charter of Fundamental Rights of the European Union (CFREU) guarantees the right to education in Article 14, establishing it as a mandate for Member States and thus enshrining in a supranational text a right that is included in all Member States' constitutions. It is a right protected by previous international texts, such as the 1989 United Nations Declaration of the Rights of the Child (Zendeli, 2017), which currently faces the challenge of adapting to a

context of profound digitalisation, requiring its necessary reconfiguration to guarantee access in diverse contexts. In short, overcoming the various digital divides arising from territory, digital skills, economic income, gender, or age. The digital divide, understood as “the distance between individuals, residential areas, business areas and geographical areas at different socio-economic levels in relation to their opportunities to access new information and communication technologies, as well as the use of the Internet, which ultimately reflects differences both between countries and within them (OECD, 2001)” is connected to information technologies and can affect access, digital skills, or educational content (Beltrán, 2024).

The right to education as defined in the CFREU does not specifically cover this new configuration of higher education, and legal scholars (De Pasquale, 2022) are currently calling for a Charter of Fundamental Digital Rights to protect the rights of European citizens in the face of new threats and risks. The diverse positions of the Member States hinder progress in this direction, but this has not prevented the joint approval by the European Parliament, the Council, and the Commission of the European Declaration on Digital Rights and Principles for the Digital Decade (2023/C 23/01). Among the many new features of the Declaration, point 4 is particularly noteworthy: “Digital education, training and skills”: “Everyone has the right to education, training and lifelong learning and should be able to acquire all basic and advanced digital skills.

We commit to: a) promoting high-quality digital education and training, also with a view to bridge the digital gender gap; b) supporting efforts that allow all learners and teachers to acquire and share the digital skills and competences necessary for active participation in the economy, society and democratic processes, in particular media literacy and critical thinking; c) promoting and supporting efforts to equip all education and training institutions with digital connectivity, infrastructure and tools; d) giving everyone the possibility to adjust to changes brought by the digitalisation of work through up-skilling and re-skilling. As can be seen, the European Declaration seeks not only to ensure that students acquire digital skills, but also to turn universities and other educational institutions into agents of change and social inclusion. The declaration thus encompasses not only new forms of education, such as online education, but also support for teachers to improve their digital skills and their commitment to transformation. Education must also become the instrument that bridges the gap between the lack of digital skills and new jobs, which is why it is necessary to know the extent of the commitment of public managers currently.

2.2. Digital transformation of education

The digital transformation of education is a process that emerged as a need to adapt to innovations in society that have generated new business models, new behaviours, and new generations of digital native students.

This process is complex and dynamic, determined by the rapid evolution of information technologies and the need to adapt educational systems to the new requirements of the knowledge society (Mukul, E., & Büyüközkan, G., 2023). However, the integration of digital technologies in education does not mean only the use of IT tools; it must be accompanied by a profound change in pedagogical paradigms to redefine the role of the teacher, teaching methods, and the way students and pupils learn. The intensive digitalization of services provided to the population in recent years has highlighted the significant role that education plays in developing digital skills, preparing future generations to integrate into an increasingly digital world, and supporting innovation with relevant skills provided by the educational system.

Therefore, the integration of Industry 5.0 technologies, such as artificial intelligence (AI), Big Data, the Internet of Things (IoT), and digital learning platforms with a human-centric approach, has become a central element in modernizing education (Chigbu, B. I., & Makapela, S. L., 2025; Ferrigno et al., 2023; Saihi et al., 2023; Agarwal et al., 2025). Technology contributes to increasing access to quality educational resources, personalizing the learning process according to learning pace and style, monitoring learning, and providing personalized feedback. E-learning platforms, virtual workspaces, and collaborative learning tools enable adapting content to students' individual needs, monitoring progress in acquiring learning skills, and providing a

flexible, student-centered learning environment. The challenge for educational institutions is to have a clear vision for the digital transformation process, ensuring it is implemented efficiently and with results. According to Castro Benavides et al. (2020), many universities have developed strategies for adopting digital transformation, but these are not implemented efficiently. The digitalization of education must be closely linked to the curriculum alignment with labor-market demands and to transition to advanced educational models, such as Education 5.0, which is more sustainable development goals (SDG) focused (Agarwal et al., 2025; Veckalne, R., & Tambovceva, T., 2022).

The adoption of digital technologies in education was accelerated by the COVID-19 pandemic, which forced educational institutions to implement online solutions to continue teaching (Csorba, L. M., & Dabija, D. C., 2024). However, this sudden transition highlighted both the potential of digital technologies and their limits and problems in the system. The challenge during the COVID-19 pandemic favoured the adoption of e-learning platforms with related digital tools, the sustainable integration of technology in education creating the premises for new educational models with hybrid teaching solutions, but also reflected the insufficient digital skills of teachers, students and parents, or the existence of large gaps between various social environments (Mercader, C., Gairín, J., 2020; Babu et al., 2024; Imran et al., 2025; Iivari, N et al., 2020).

The traditional teaching-learning model is becoming insufficient in the context of new technological developments, and new educational paradigms are needed that develop relevant skills for the new digital-native generations who will be active in the next 40 years in a dynamic labor market. The new approaches emphasize active learning in which the role of the teacher is that of a facilitator, collaborative and interdisciplinary learning that allows the development of meta-skills necessary for future graduates in a super smart society (Society 5.0): autonomy, discipline, digital skills, creative thinking, critical thinking and entrepreneurial thinking (Shahidi Hamedani et al., 2024; Miclea M., 2021). Education is no longer sufficient as a process of accumulating information, and just integrating digital technologies is not enough; it must stimulate innovation, creativity, and the solving of real societal problems to build a sustainable and resilient society. The integration of technology into education requires a change in teachers' mentality, a reorganization of educational roles - the teacher becomes a facilitator, and the students are actively involved in building knowledge, and a clarification of ethical aspects to ensure the responsible use of digital tools (Holmes, W., & Miao, F., 2023).

Education must keep up with society's evolution and needs, but it must also position itself at a higher level that stimulates innovation and drives long-term progress. Currently, the educational process is transitioning from Education 4.0, adapted to Industry 4.0, which focuses on digitalization and the integration of tech-

nologies into education, to Education 5.0, which marks a significant evolution by integrating technology with human values and ethical and sustainable approaches. Education 5.0 promotes a human-centered approach, in which technology serves to increase well-being and quality of life. Education 5.0 responds to the needs of Industry 5.0 and Society 5.0, being aligned with the Sustainable Development Goals (Lantada, 2020). The pillars of Education 5.0 are research, innovation, community involvement, and digitalization, and it proposes advanced personalization of learning through artificial intelligence. Artificial intelligence has made significant contributions to both the teaching process and the streamlining of administrative and management tasks in education. In teaching terms, artificial intelligence can adapt learning to the student's pace and style, provide real-time feedback, provide personalized support, and also increase student motivation, interest, and engagement, being a complementary tool in the educational process (Tahiru, 2021; Andres et al., 2022; Khang et al., 2023).

3. Research Methodology

The methodological design of this study arises from the recognition that digitalization is not a homogeneous or linear phenomenon. It operates at the intersection of several systems – educational structures, market dynamics, policy frameworks, and cultural norms. To capture this complexity, a cross-national survey was de-

veloped to examine how the technologisation of higher education, particularly through the growing integration of artificial intelligence (AI), shapes students' learning practices, digital competencies, and perceptions of educational transformation. The instrument integrates both structural variables (e.g., institutional type, financing mechanisms, governance models) and subjective assessments (e.g., perceived digital competencies, institutional readiness, user experience). A mixed-format questionnaire was used, combining quantitative scales with open-ended prompts, thereby balancing analytical rigor with the flexibility required for contextual interpretation and enabling a comprehensive assessment of digital fluency development across diverse institutional and cultural settings.

The survey instrument was grounded in established theoretical frameworks in digital education, human-technology interaction, and AI literacy, while emphasizing international comparability and interdisciplinary inclusivity. It consisted of closed-ended items, including a five-point Likert scale and multiple-choice questions, complemented by selected open-ended prompts enabling respondents to elaborate on their experiences and expectations. The questionnaire was organised into a series of coherent thematic blocks that moved from descriptive to more analytical content. It began with demographic and contextual variables, followed by items on students' access to digital resources and their digital competencies. Subsequent sections examined the use and impact of digital and AI tools in learning,

perceptions of institutional policies and governance, and economic considerations related to digitalisation. The final part included openended questions allowing students to reflect on challenges, risks, and future directions of educational digital transformation.

To ensure content validity, conceptual coherence, and cross-cultural relevance, the instrument underwent a multi-stage validation process. First, a panel of experts from the participating universities evaluated the draft questionnaire for clarity, relevance, and theoretical alignment. Their feedback informed revisions to item wording, scale construction, and sequencing. The revised version was subsequently pilottested with small student samples in each participating country (approximately 10–15 students per site) to assess comprehensibility, response variability, and completion time. Minor refinements were introduced to improve precision and optimize survey flow. Given the multilingual nature of the study, national research teams translated the English master version into their respective languages, followed by a systematic bilingual review to ensure semantic equivalence and contextual sensitivity. The design also meets ethical standards consistent with the General Data Protection Regulation (GDPR), guaranteeing data anonymity, voluntary participation, and transparent dissemination of research purposes.

The studied population included pupils (respondents over 18) and students enrolled in universities in France, Latvia, Poland, Romania, and Spain. Parents and grandparents of students also participated in the

survey, but for this article, only the responses of pupils and students – i.e., people who have self-identified themselves as students formally enrolled in a higher education programme – are analysed. Other roles, as well as those not related to formal university education or visiting students, were excluded from the analysis. The survey was also made available to students in Finland (University of Jyväskylä), but the number of responses was too small for inclusion in the analysis. A non-probability purposive sampling strategy was adopted, relying on institutional communication channels, such as university mailing lists, learning management systems, student platforms, and in-class announcements. Data collection took place between December 2025 and February 2026 using an online survey platform. Participation was voluntary, anonymous, and independent of academic evaluation. After data cleaning, the final analytical sample comprised 534 valid responses: Latvia (n = 172), Poland (n = 110), Romania (n = 103), Spain (n = 59), and France (n = 90). In total, 23 responses were removed because they were incomplete, incorrectly filled out, or did not meet the inclusion criteria. As the survey instrument was standardised across all countries, the merging of national datasets involved verifying consistency in variable labels and coding before constructing the consolidated master file.

For the study, a Master Survey was developed as a model research instrument. It was then translated into national languages by research teams in individual countries, with terminological and contextual con-

sistency. This process ensured that all versions of the survey were substantively and semantically equivalent, allowing for comparability of results on an international scale. The analyses in this chapter draw on the subset of survey items focusing on pupils (over 18 years of age) and students' use of digital tools and AI, their preferred digital–traditional learning balance, and their opened reflections on hopes and concerns about future educational technologies.

4. Results and analysis

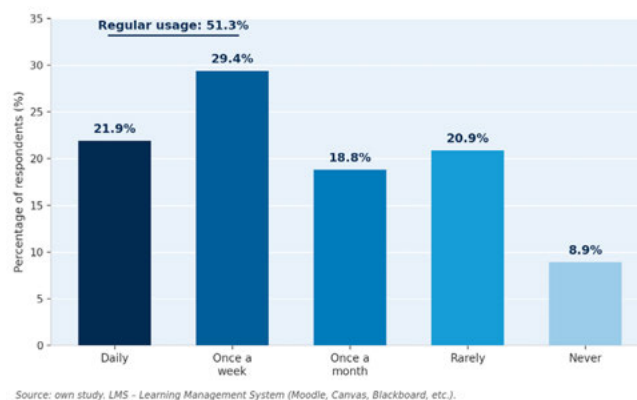
The survey results reveal a multifaceted picture of how European young respondents, pupils (over 18 years of age), and higher education students engage with digital technologies and, more specifically, with artificial intelligence tools in their learning and academic practices. The findings are organized around three thematic axes: the frequency of use of digital technologies in study and the nature of AI-driven tool adoption, respondents' preferred balance between digital and traditional learning modalities, and their expectations and concerns regarding the future of educational technology.

4.1. Frequency of use of digital technologies in the study

One group of questions concerned the frequency of use of digital technologies for learning purposes. This

shows how often respondents use modern tools when acquiring knowledge.

Graph 1: How often do you use the following technologies in learning/study?



Source: own elaboration based on the survey conducted

The most important conclusion from the chart is the clear dominance of AI tools in everyday use – 44.9% of respondents say they use them every day, which is significantly higher than for other technologies (Online Collaboration Tools: 27.5%; LMS: 22.0%; video conferencing: only 13.9%). A total of 81.8% of students use AI tools at least once a week (the sum of “Every day” and “Once a week”), which proves their deep integration into everyday academic practice. The percentage of people who do not use AI at all is only 2.3% – the lowest of all four categories.

The data reveal a significant asymmetry in students’ technological literacy. AI tools, which are relatively new technology in the educational context, have achieved the highest level of use in everyday life, surpassing tools with a longer tradition of use in education (LMS, video conferencing). This phenomenon suggests that the adoption of technology in the academic environment is no longer solely a function of top-down institutional implementation, but is increasingly the result of bottom-up, autonomous student initiative. In the context of digital fluency theory, this means a transition from passive use of imposed platforms to active, independent selection of tools that support cognitive processes, which constitutes a qualitatively higher level of digital competence.

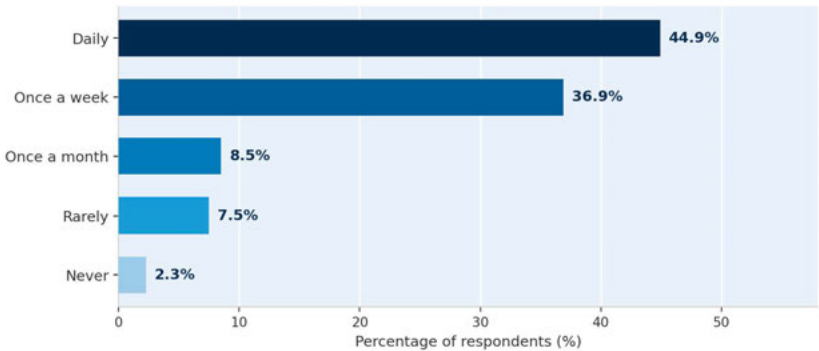
Equally revealing is the nature of this engagement. Graph 2 (AI Purposes) demonstrates that the most prevalent uses of AI among respondents are brainstorming and idea generation (62.7%), summarizing texts and lectures (61.9%), exam preparation (55.9%), and proofreading and editing (50.7%). Writing drafts (36.0%) and solving complex problems (40.0%) also featured prominently.

The three most frequently indicated goals have a common feature: they are activities involving higher cognitive functions, related to the synthesis, selection,

and processing of information. The fact that these applications dominate, and not, for example, simple generations of ready-made texts, suggests that students treat AI tools primarily as support for thought processes (cognitive scaffolding), and not as a substitute for their own intellectual work. These usage patterns confirm that students deploy AI tools across cognitively demanding tasks requiring selection, evaluation, and synthesis, activities that are central to the development of digital fluency as conceptualized in the literature.

Further granularity is provided by Graph 3, which shows that 44.9% of students use generative AI like ChatGPT daily, with an equivalent 36.9% doing so weekly.

Graph 2: Main Purposes for Using Generative AI Tools



Source: own study, Filtered_Survey_2026, n = 483 (60 blank responses excluded).

Source: own elaboration based on the survey conducted

The vast majority of students surveyed (81.8%) use AI-based tools at least once a week, with almost half (44.9%) using them daily, demonstrating the deep structural integration of AI into everyday academic practice. The categories of sporadic use — “Once a month” (8.5%) and “Rarely” (7.5%) — together account for only 16% of the population, forming a clear minority with limited contact with AI technologies in an educational context. The marginal percentage of people who do not use these tools at all (2.3%) indicates that the adoption of AI in the learning process has reached a stage of almost universal diffusion, exceeding, in Rogers’ (2003) terminology, the threshold of the so-

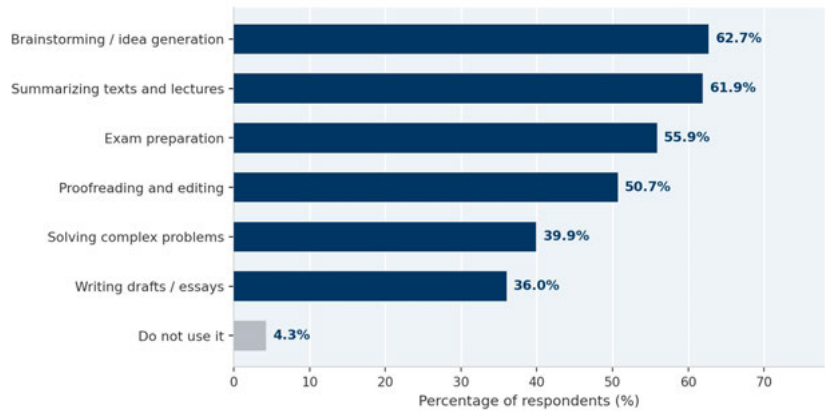
called late majority. The distribution of data — strongly right-skewed, with a dominance in the highest frequency category — suggests that the use of AI tools is no longer innovative or experimental behaviour, but an established behavioural norm in the surveyed student population of five EU countries.

4.2. Preferred Digital-Traditional Balance

Despite high AI tool usage, students’ preferences regarding instruction modality reveal a more nuanced stance.

Graph 4 shows that the largest group of respondents, 40.2%, favours a mostly in-person model supplemented by digital components. A further 24.5% prefer a balanced 50/50 hybrid model. By contrast, only 3.6% expressed a preference for mostly digital education, and a negligible 0.4% opted for fully digital instruction. These results suggest that while pupils/students readily adopt digital tools for specific learning/academic tasks, they continue to value in-person pedagogical interaction. Technologisation of education, in this light, is perceived not as a replacement for traditional learning environments but as an augmentative layer enhancing the overall quality of face-to-face education.

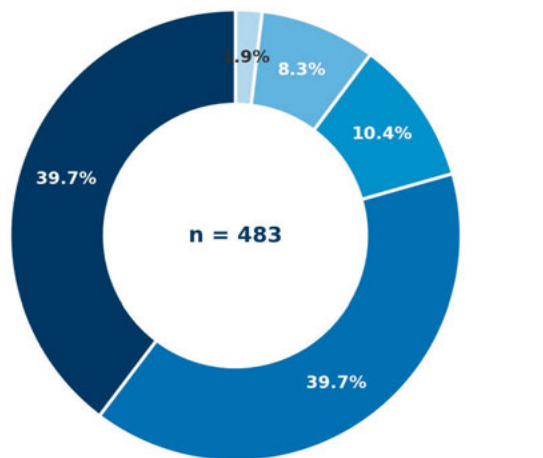
Graph 3: How Often Do You Use AI-Based Tools in Learning (e.g., Personalized Learning, Generative AI like ChatGPT?)



Source: own study. Total > 100% due to multiple-choice responses.

Source: own elaboration based on the survey conducted

Graph 4: What Is the Ideal Balance Between Digital and Traditional Education?



Source: own study. Categories: ChatGPT, Copilot and other generative tools.

■ Daily (39.8%) ■ Once a month (10.4%) ■ Never (1.9%)
■ Once a week (39.8%) ■ Rarely (8.3%)

Source: own elaboration based on the survey conducted

4.3. Expectations and Concerns

The open-ended responses, thematically coded and presented in Graphs 5 and 6, provide further insight into how students conceptualize the role of technology in education.

When asked about their greatest hope for educational technology, 46.8% of respondents identified

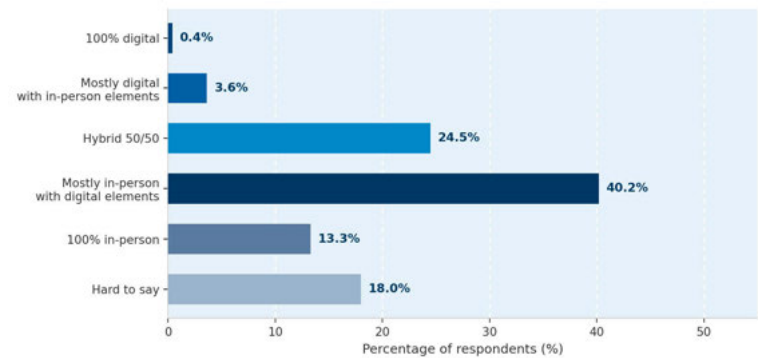
better teaching tools and methods as the most desirable outcome. Improved access and equality (8.0%) and more efficient learning (9.6%) were also noted by respondents. Notably, 12.2% could not articulate a specific hope, possibly reflecting uncertainty about the direction of ongoing technological change.

Conversely, the dominant concern, expressed by 43.2% of respondents (Graph 6), was over-dependence on technology, followed by the loss of critical thinking and creativity (16.3%) and the replacement of teachers or dehumanization of education (9.2%).

These findings are significant for the discourse on digital fluency, as they indicate that students are clearly aware of the risks associated with the adoption of uncritical technology. Digital fluency, as understood by respondents, encompasses not only the capacity to use digital tools effectively but also the ability to maintain critical distance and preserve the human-centred values emphasized within the Education 5.0 paradigm.

Taken together, these results portray a student population that is digitally active and increasingly AI-literate, yet simultaneously cautious about the potential consequences of excessive technological reliance. The data strongly support the proposition that technologisation of education, when implemented thoughtfully, can serve as a powerful vehicle for building digital fluency, provided it is accompanied by pedagogical strategies that foster critical engagement rather than passive consumption.

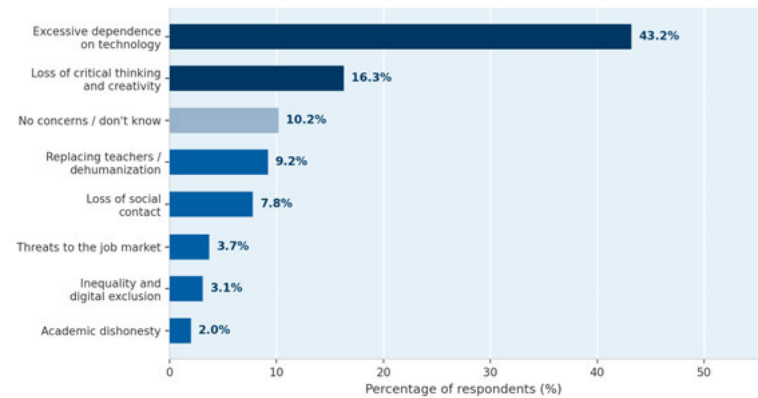
Graph 5: Greatest Hopes Regarding the Future of Digital Technologies in Education



Source: own study. n = 445 (98 inconsistent/blank responses excluded).

* Open-ended question: 188 valid free-text responses thematically categorized, 181 misaligned responses from adjacent columns, and 174 empty/minimal responses excluded. Source: own elaboration based on the survey conducted

Graph 6: Biggest Concerns Regarding the Future of Digital Technologies in Education



Source: own study. Open-ended responses categorized thematically.

* Open-ended question: 294 valid free-text responses thematically categorized. 249 empty/minimal/non-answer responses excluded. Source: own elaboration based on the survey conducted

5. Discussion and Policy Implications

As a part of a broader trend towards policies of “empowerment” of the individual (Castel, 2011), everyone is encouraged to autonomously manage their own financial and social capital and risks. The survey results presented in this chapter suggest that a parallel empowerment dynamic is already underway in the educational sphere: 81.8% of the surveyed European students use AI-based tools at least once a week, with 44.9% doing so daily, indicating that the autonomous adoption of digital technologies has become a structural feature of contemporary academic practice.

In this context, improving the financial education of students appears to be a key lever for contemporary public policy. The challenge is no longer simply to disseminate theoretical knowledge, but to equip individuals with the practical skills needed to assess risks, evaluate strategies, and make informed decisions. The concept of technologization of education as a tool for building a digital fluency bridge extends this reasoning beyond the financial domain: just as financial literacy requires not merely knowledge but the capacity to act upon it, digital fluency demands the ability to critically select, evaluate, and integrate digital tools into cognitively demanding tasks.

Our findings confirm this higher-order engagement — the most prevalent uses of generative AI include brainstorming (62.7%), summarizing texts and lectures (61.9%), and exam preparation (55.9%), all involving synthesis and reorganization of information rather than passive consumption.

Technological and digital tools offer unprecedented opportunities in this regard. E-learning platforms, investment simulators, serious games, and interactive modules allow users to experiment with complex situations in a concrete and progressive manner. The survey data reinforce this by revealing that AI-based tools have surpassed institutionally embedded technologies in daily usage: 44.9% for AI tools versus 27.5% for online collaboration tools, 22.0% for LMS (Learning Management Systems), and 13.9% for videoconferencing. This asymmetry suggests that technology adoption in academic settings is increasingly driven by bottom-up student initiative rather than top-down institutional implementation.

For students exposed to life-changing financial decisions, these tools provide a learning environment tailored to their digital habits, incorporating personalization mechanisms to offer differentiated learning paths. However, survey findings indicate that students do not equate digital engagement with a desire for fully digitalized education. The largest group (40.2%) favoured a mostly in-person model supplemented by digital components, and 24.5% preferred a balanced hybrid. Only 4% expressed a preference for mostly or

fully digital instruction. This confirms that students perceive technology as an augmentative layer enhancing face-to-face education — directly supporting the bridging metaphor in the title of this chapter: digital fluency is built not by substituting traditional pedagogy but by integrating digital tools into a predominantly human-centred learning environment.

Digital technology should therefore be viewed as a structured learning environment combining information, simulation, and feedback. Students' own perceptions echo this: 46.8% identified better teaching tools and methods — not faster or more automated learning — as their greatest hope for educational technology, aligning with a vision of technology as a qualitative enhancer of pedagogy.

However, the integration of these tools raises important questions. Education cannot be reduced to individual responsibility without parallel reflection on regulation. The effectiveness of digital tools depends on their educational quality, neutrality, and ability to develop critical thinking. The survey data lend empirical weight to this concern: 43.2% of respondents identified over-dependence on technology as their dominant worry, followed by loss of critical thinking (16.3%) and replacement of teachers (9.2%). These findings demonstrate that students themselves understand digital fluency as encompassing not only the capacity to use tools effectively but also the ability to maintain critical distance — resonating with Fornero's (2015) argument that literacy, whether financial or digital, must enable

individuals to critically evaluate complex systems, not merely operate within them.

Ultimately, while improving literacy through technology is a promising avenue, it must be part of a balanced approach: educating students to understand mechanisms while maintaining critical distance. The empirical evidence portrays a student population that is digitally active and increasingly AI-literate, yet cautious about excessive technological reliance. The results strongly support the proposition that technologization of education can serve as an effective bridge toward digital fluency — provided it is accompanied by pedagogical strategies fostering critical engagement rather than passive consumption and embedded within a broader framework balancing individual empowerment with institutional responsibility for the quality, equity, and ethical integrity of digital learning environments.²

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² Note: Grammarly Pro was used for proofreading <https://app.grammarly.com/>

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CHAPTER 7

OPEN INNOVATION THROUGH LIVING LAB METHODOLOGY FOR GREEN TRANSITION

Maria Josep Picó Garcés*

1. From the Silent Spring to the European Green Deal and the 2030 Agenda

Since the publication of *Silent Spring* by Raquel Carson and the creation of the European Universities Initiative transnational network almost a century ago, the environmental issue has undergone a long historical process that has generated immense controversy, while also becoming firmly established on political agendas. Carson wrote that the challenge of ecological deterioration was more complex than the one posed by the atomic threat and, taking a broader perspective, emphasized the devastating impact of industrial development and agricultural practices on biodiversity and environmental pollution across the eastern United States (Carson, 2026, p. 12). It was not until 1962, a decade after environmental organizations had emerged an awareness of ecological concerns had begun to spread in Europe, that these concerns became a matter of public interest, as reflected in the first Massachusetts Institute of Technology (MIT) report commissioned by Donella

Meadows, which highlighted the consequences of population growth and economic development, emphasizing the limits of the planet and the need to consider factors such as resource constraints and the capacity of ecosystems to absorb certain types of contamination (Meadows et al., 2006).

The United Nations acted through the first World Environment Conference in 1972, a period during which concerns regarding the first signs of environmental imbalance and the concept of “those who pollute should pay” were gaining increasing prominence. Six years later, the first European regulation on nature conservation was approved, establishing a common framework for the protection of wetlands and laying the foundations for future environmental legislation. In 1985, the report *Our Common Future*, coordinated by the Norwegian Prime Minister Gro Harlem Brundtland, established the foundations of sustainable development. Since then, the European Union has become a global benchmark in environmental policy, most recently through the Nature Restoration Law (2024), which forms part of the

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European Green Deal and the Paris Agreement, within a context marked by the climate crisis and emerging trends in the ecological transition.

The *European Universities Initiative* was conceived at the 2017 Gothenburg Summit and launched a year later, with the first alliances getting underway in 2019. One of its key objectives is to develop a new strategy for creating alliances between European universities, covering teaching, research and knowledge transfer. And within this new framework, one of the priority areas is to integrate European and global initiatives related to sustainability, such as the European Green Deal and the United Nations 2030 Agenda with its 17 Sustainable Development Goals (SDGs).

2. Sustainability as a challenge for shaping European universities

There are currently 73 European university alliances involving approximately 650 higher education institutions. Sustainability is one of their main areas of action, reflecting the crucial role of these institutions as agents of change for sustainable development and a just transition through teaching, research, and societal engagement. Universities are not only institutions capable of contributing to the creation of an environmental culture and guiding sustainability initiatives for their internal stakeholders, including students and staff; they

also have a responsibility to contribute to regional and national sustainability (Deirmentzoglou et al., 2025).

Several alliances place sustainability at the centre of their mission. This is the case, among others, of AURORA (sustainability and social impact), EU Green (sustainability and green transition), EUniWell (well-being and mental health), EUTOPIA (social sustainability and inclusive communities), SEA-EU (coastal and maritime sustainability), EU-CONEXUS (smart urban coastal sustainability), SUNRISE (sustainable futures and resilience), UNIGREEN (green and sustainable universities), and EC2U (smart and sustainable cities).

The ENLIGHT Alliance¹, whose mission focuses on equitable quality of life and sustainability, has developed a Sustainability Engagement Mission Statement, which aims to contribute to sustainable development and to lead by example through concrete actions in governance, education, and research. This mission statement has been operationalised through five main dimensions: governance, by introducing an institutional culture of sustainability through the support of Green Offices and the engagement of internal and external stakeholders; research, by developing a common sustainable research and innovation action plan, an R&I Support Group, an R&I Observatory, and open science approaches aligned with the alliance's sustainability commitment; education, by stimulating the integration of Education for Sustainable Development into

¹ ENLIGHT sustainability engagement statement: <https://enlight-eu.org/docs/2021-ENLIGHT-Sustainability-Engagement.pdf>

existing programmes and promoting the concept of global citizenship; transfer, by implementing ENLIGHT Living Labs, ENLIGHT European and Global Dialogues, and multifaceted partnerships and networks to foster transparent and continuous collaboration; and operations and facilities, by promoting sustainable mobility and embracing circular economy principles. ENLIGHT has established a network of Green Offices across its partner institutions. Their first goal is to jointly promote sustainable and green mobility to harmonise internationalisation with the need to reduce the environmental impact and carbon footprint of travel.

Another significant case in this area is EUT+. This Alliance has created the European Sustainability Science Lab (ESSLab+)² to implement transdisciplinary research on sustainability, bringing together stakeholders from civil society, engineering, and the natural and social sciences. This lab aims to produce knowledge on sustainability, transfer it to society, and explore new ways of conducting sustainability research. ESSLab+ is a multinational, multicampus, transdisciplinary and interdisciplinary research group that aims to become an established research institute within EUT+ in fields such as agriculture, food and soil management, water, circular economy, sustainable values in economics and human capital, and renewable energies. This support unit plays a significant role in developing synergies, bringing alliance researchers together, connecting

stakeholders, and laying the foundations for impactful research within alliances and in the context of their partner institutions.

The ability to meet society's changing needs entails being able to solve real and everyday societal problems. In this sense, all alliances are committed to a university model that advances societies' capacity to accelerate the achievement of sustainable development objectives. Good practices focused on these objectives have proved to be among the most powerful tools for generating innovation and social integration and, therefore, have significant potential for replication in future models of civic universities (Arnaldo Valdés et al., 2022).

In the field of education, it is also worth noting that Green Education is one of the six focus topics of the *European Universities Initiative* for realising the European Education Area. The European Union is encouraging the education and training sector to act in support of the green transition and to strengthen sustainability competences among all learners. The other priorities are: improving quality and equity in education and training; revalorising the teaching professions and providing teachers, trainers, and school leaders with high-quality initial education and professional development opportunities; promoting the development of a high-performing European digital education ecosystem and enhancing citizens' competences and skills for the digital transition; STEM education and training;

2 <https://esslab.pubpub.org/>

and the international dimension of the European Education Area. At the same time, sustainability and the environment rank first among the 13 thematic areas most frequently addressed by the alliances, followed by digital transformation, as shown in Figure 1.

As a result, alliances have accelerated the uptake of innovative pedagogies by offering challenge-based, research-based, and inter- and transdisciplinary transnational learning. They have provided opportunities for students to engage with peers, academics, researchers, regional actors, industry, and civil society through challenge-based approaches, enabling them to address challenges from an interdisciplinary and cooperative

perspective. Common topics in challenge-based approaches include sustainability, local ecosystems, climate change, the Sustainable Development Goals, gender equality, migration, democracy, diversity, and inclusiveness (European Commission, 2025).

Several alliances have established transdisciplinary teams to develop educational programmes, one of the most innovative elements of the initiative. The CHARM-EU Alliance offers challenge-based educational models focused on solving real sustainability challenges aligned with the SDGs. It began by creating teams of academics from multiple disciplines across its five partner universities around sustainabi-



Figure 1: Summary of the main themes covered by European Universities alliances (European Commission, 2025)

lity challenges related to water, food, life, and health. These initial teams are now being joined by professionals from companies, members of non-governmental organisations, other civil society organisations, and the public sector, to provide students with a global perspective on future challenges. Its master's programme in Global Challenges for Sustainability integrates science, governance, technology, the humanities, and sustainable entrepreneurship. Similarly, the BASUS programme (Bachelor in Sustainability) of the Una Europa Alliance is regarded as one of the most advanced examples in the field of sustainability, integrating global health, cultural heritage, artificial intelligence, and future cities.

Sustainability is increasingly recognised as a core value within universities, positioning them as central actors and role models in global sustainability efforts. All nine FORTHEM partner universities have played an important role in the field of sustainability and actively implement sustainability principles in both infrastructure and study and research processes. The main goal of the Green Skills Task Group has been to compile existing study courses on sustainability and green skills offered by the universities in the alliance, adapt them to the alliance's requirements, and add them as open-access resources in the Digital Academy³.

3. FORTHEM Principles of the Sustainability Strategy

Through intensive and innovative forms of cooperation and the development of a new university model, the FORTHEM Alliance is contributing to a sustainable future in education and research and, more broadly, by helping local communities to address forthcoming challenges. This goal is set out in the document *FORTHEM Principles of the Sustainability Strategy*⁴.

The first objective of this report is to plan and implement project activities for the sustainable development of the regions where FORTHEM universities are located. Students and academics from partner universities are expected to work closely with companies, schools, and municipal authorities to find solutions to the challenges faced by their regions and cities. The second objective concerns the long-term sustainability of the FORTHEM Alliance itself.

Through teaching and research, knowledge-based innovation, and greening strategies, the academic communities of the FORTHEM Alliance are committed to playing a key role not only in raising awareness and responsibility for sustainable development but also in engaging practically in support of sustainable activities. FORTHEM Alliance partners have agreed on nine sustainability principles:

3 <https://elearning.FORTHEM-alliance.eu>

4 https://api.FORTHEM-alliance.eu/fileadmin/FORTHEM_Sustainability_principless.pdf

1. Sustainable development policies and implementation plans, as well as defined alliance priority areas and priority actions.
 2. Evaluation of the educational offer, with further broadening of the introduction of the sustainability concept into courses, e-learning, programmes, and research projects. It is important to analyse the effects of climate change through educational courses for students and special educational programmes for the community, since it is difficult to find solutions when education on climate change is lacking. Alliance partners will provide comprehensive training covering climate change, employment, poverty alleviation, and food security.
 3. Development of joint projects and the creation of multidisciplinary and interdisciplinary research teams addressing societal problems and challenges, together with the implementation of relevant initiatives focused on the future of FORTHEM partners' regions.
 4. Improvement of environmental and working conditions, including space management, building renovation, IT equipment and cooling systems, acquisition of goods and services such as metals, paper, glass, and stationery, as well as emission reduction and progress towards carbon neutrality.
 5. Development of energy consumption plans for campus buildings, laboratories, IT systems, infrastructure construction and maintenance, and waste management systems, including residual, paper, industrial, and hazardous waste.
 6. Support for students in minimising the carbon footprint of their accommodation, promoting energy efficiency, and adopting sustainable habits that last well beyond their studies.
 7. Students as sustainability agents, through activities promoted by the FORTHEM Student Council group and the development of the Green Forum as a platform for discussion and implementation of sustainable ideas.
 8. Establishment of a FORTHEM sustainability collaborative network, in which universities and communities work together for positive change, learning from different realities, sharing information, and acquiring knowledge of new perspectives and trends to support the economic and social sustainability of their respective regions.
- The FORTHEM Alliance has planned several outputs within the project's main activities, all of which incorporate sustainability: the Digital Academy, Mobility Plans, FIT to encourage innovative thinking and entrepreneurial spirit, FORTHEM Outreach to promote societal involvement, and FORTHEM Labs for Education, Research, and Innovation. Four of the seven labs are linked to sustainability: Climate and Resources, Resilience, Life Quality and Demographic Change, Food Science and Digital Transformation.

4. Quadruple helix for Open Innovation

The *European Universities Initiative's* alliances have also reinforced their commitment to European values, including academic values and democracy. They connect learning with social realities beyond the classroom and nurture skills required for civic engagement, including multilingualism and interculturality. They also contribute to building greater trust in democratic institutions, increasing interpersonal trust and tolerance for diversity, and disseminating knowledge to society through open education. In addition, they inform citizens and promote the credibility and value of science, as well as the rigorous scientific processes involved in knowledge generation, through open science. The alliances have structured their operations to embody democratic and inclusive governance principles, using their educational platforms to instil a sense of European citizenship and foster appreciation for both diversity and unity.

Almost 75% of alliances have established, or are in the process of establishing, departments, centres, living labs, or other structures and initiatives to support citizen engagement. Almost 90% are actively engaged in sharing good practices with other university networks and organising outreach and dissemination events, while more than two-thirds actively publish open-source educational and management materials (European Commission, 2025).

The monitoring framework of the European Universities Initiative developed in this context indicates

that more than 70% of alliances have developed, or are developing, quadruple-helix cooperation initiatives. The involvement of associated partners from local and regional businesses and civil society has driven innovation in pedagogies and shaped curricula that are more relevant to labour-market needs and to supporting the green and digital transitions.

In this context, and in response to the challenges involved in shaping the European university, the living lab has become an innovative and highly useful methodology. A living lab is a physical or virtual space designed to address societal challenges, especially in urban areas, by bringing together diverse stakeholders for collaboration and collective ideation. Living labs are considered a multidisciplinary phenomenon and encompass various research domains, although they are usually discussed within open and user-innovation paradigms as landscapes, real-life environments, and methodologies that include heterogeneous stakeholders and apply various business models, methods, tools, and approaches (Hossain et al., 2019).

The European Network of Living Labs (ENoLL), an umbrella organisation for living labs around the world, defines them as “user-centred open innovation ecosystems based on a systematic user co-creation approach, integrating research and innovation processes in real-life communities and settings” (Schoorman et al., 2025). This definition underlines the importance of engaging end-users as co-creators rather than passive recipients, ensuring that products, services, and policies

developed within living labs are practical, relevant, and community-driven. Living labs operate as collaborative ecosystems built around the quadruple-helix model of open innovation: citizens and civil society contribute lived experiences and needs; academia provides research and scientific evidence; the private sector offers market perspectives and the capacity to scale; and public authorities ensure alignment with policy frameworks and societal priorities. By connecting these four groups, living labs create neutral and trust-based environments in which experimentation and learning can take place collectively.

On the one hand, open innovation is a paradigm that assumes firms can and should use external ideas and internal ideas, together with internal and external paths to market, as they seek to advance their technology. It is a form of innovation in which the organisation interacts with its external environment. This interaction results in the adoption of either inbound or outbound innovation processes. The quadruple-helix model for open innovation argues that the integration of industry, academia, government, and society is essential for organisational development. This, in turn, challenges organisations to respond to dynamic environments (Parveen et al., 2015).

On the other hand, living labs are also closely linked to responsible innovation, as they prioritise inclusivity, ethics, and societal impact within innovation processes. They ensure that new solutions are not only innovative but also meaningful and beneficial to society. Re-

sponsible innovation is connected to transition theory, which emphasises that fundamental societal change often begins on a small scale through practice-based experiments in local contexts (Schuurman et al., 2025).

Sustainability is an important element of the living lab phenomenon, and several studies have addressed this dimension. Some analyse innovation and development activities aimed at improving everyday life in sustainable ways (Hossain et al., 2019). Others examine transition labs as mechanisms for achieving change in sustainable development, the link between sustainable innovation and living labs, and the role of design, practice, and processes in environmental transformation. Further studies have explored sustainable development in smart city activities (Leminen et al., 2016) and even the use of video games and storytelling to innovate and promote gamification in the field of climate crisis communication (Picó Garcés & Sáez-Soro, 2025).

European University alliances are expected to promote open science as a research approach that emphasises open collaboration and the sharing of knowledge, results, and tools as early and openly as possible. *The Unite! Alliance white paper. A New University Open Science and Innovation Governance Model and Policy for a Sustainable World* argues that novel open science practices for sharing and producing knowledge have created extraordinary possibilities for new knowledge creation and transfer processes. These practices expand not only the ethos of science but also the ethos of innovation in universities. Open science practices

are transforming science and innovation in universities, and new open innovation practices are emerging, including novel inbound and outbound open exploration practices. The major societal challenges we face in building a sustainable world can only be addressed through new ideas and humanistic ideals, new levels of integration, new science and innovation practices, and mechanisms of global collaboration among research communities, students, staff, faculty, citizens, companies, municipalities, and international organisations such as the European Commission, the United Nations, and the World Bank (Vicente-Saez et al., 2023).

The EU-CONEXUS Alliance white paper *Research for Society: White Paper on Open Science Practice and Barriers*⁵ is particularly relevant for its focus on barriers. To overcome specific obstacles, it is crucial to understand the expectations, or rather the benefits, of open science policies from the perspective of researchers, educational and research institutions, governments, society, and funders. This diversity of approaches will inevitably involve difficulties, since it is necessary to consider the possibility, or impossibility, of identifying common interests regarding open science among all the subjects involved. It therefore seems essential first to identify the common and undisputed interests of all stakeholders involved in open science policy to create pathways to overcome barriers to its implementation.

At the same time, alliances are promoting the development of sustainable alliance-level entrepreneurship and innovation ecosystems. This perspective seeks to harmonise economic growth, social inclusion, and environmental protection. It should generate benefits for all societal stakeholders and support sustainable regional development. After coordinating strategies at the alliance level, partner institutions implement them at the regional level with transnational support and continuous exchange of experience. For example, through the EC2U Virtual Institutes—joint institutes “without physical walls” hosting international interdisciplinary teams of students, teachers, researchers, and innovators—the alliance fosters the rapid integration of research results and innovation into education and delivers innovative solutions to local, national, European, and global challenges.

Similarly, ENHANCE alliance institutions have actively developed supporting environments for Sustainable Entrepreneurship and Innovation (SEI)⁶ by mapping and building synergies among diverse related activities, including educational programmes, research projects and labs, disclosures and technology transfer, incubators and accelerators, idea evaluation and development, start-up and venture formation support, financing and funding, general consultation, and networking. To this end, the alliance is establishing an

5 <https://www.eu-conexus.eu/wp-content/uploads/2023/05/D.6.2-White-paper-on-open-science-practices-and-barriers.pdf>

6 <https://enhanceuniversity.eu/sustainable-entrepreneurship/>

intra-university network on sustainable entrepreneurship and innovation to jointly understand the types of support that start-ups need for successful sustainable entrepreneurship.

5. The RossetaUVLab paradigm

In this context of European university alliance development, open innovation, and the green transition, a multidisciplinary research team at the Universitat de València, a member of the FORTHEM Alliance, has launched the Citizen Laboratory for Social and Environmental Innovation around Marjal dels Moros, a small wetland on the Mediterranean coast with high biodiversity value, recognised as both a Special Protection Area for Birds and a Special Area of Conservation.

RossetaUVLab emerged from the convergence of two European projects that had selected this wetland as a pilot area for their research. It was considered efficient to build synergies between both initiatives and with the regional environmental department to advance the participatory process for developing the Management Plan for Marjal dels Moros. The first of these projects is H2020 Restore4CS⁷ led at the Universitat de València by the Cavanilles Institute of Biodiversity and Evolutionary Biology under the direction of Professor Antonio Camacho, with the participation

of the Department of Language Theory and Communication Sciences through the involvement of Professor Maria Josep Picó, a journalism scholar specialising in environmental communication. The second is the Horizon Europe project Soteria⁸, developed by the Generalitat Valenciana and led by the Basque Centre for Climate Change, whose principal researcher is María José Sanz.

RossetaUVLab began to take shape in December 2024, in response to the need to optimise interaction with stakeholders from European projects linked to Marjal dels Moros—although this activity was not originally planned in any of the initiatives funded by the Universitat de València—and to foster their involvement in biodiversity conservation and ecosystem restoration. This was particularly relevant given that the wetland is surrounded by major industrial development also financed through Next Generation funds for the ecological transition. Especially significant in Parc Sagunt is the construction of the PowerCo gigafactory for electric-car battery cells, a subsidiary of the German company Volkswagen.

At the same time, the living lab could serve as a platform for encounters with other European interdisciplinary research projects addressing Marjal dels Moros, wetlands, ecosystem restoration, environmental governance, environmental journalism, greenwashing,

7 <https://www.restore4cs.eu/>

8 <https://www.soteriacclimate.eu/>

coastal management, territorial intelligence, ecosystem services, bioeconomy, and natural risks, among many other issues. The European project *BlueGreen Governance: Harmonizing Land and Sea for a Sustainable Tomorrow*⁹, coordinated by the University of Portsmouth, has already been integrated into this framework. The living lab also aims to generate a safe space for dialogue among the various actors involved, while promoting knowledge transfer both to citizens and the economic sector, in alignment with new narratives for addressing climate change (Pancost, 2017).

The mission of RossetaUVLab is to foster citizen engagement and dialogue among economic, cultural, scientific, political, artistic, social, communication, and audiovisual-content creation sectors, both public and private, with an international dimension and projection. This mission also considers the leadership and social responsibility of public universities and regional administrations in transferring research results, innovating knowledge-dissemination formats, promoting a culture of sustainability, environmental education, and climate-change adaptation.

The organisation of the initiative as a living lab has facilitated a research methodology involving creative processes in real-life and constantly evolving environments (Picó et al., 2021), as proposed by William Mitchell of the Massachusetts Institute of Technology, who is considered the originator of the concept (Hossain,

Leminen & Westerlund, 2019). It has also promoted open innovation in experimental environments (Leminen & Westerlund, 2019) that foster co-creation (Sanders & Stappers, 2008).

The official presentation of RossetaUVLab took place in June 2025, linked to the celebration of World Environment Day, at the Environmental Education Centre of the Comunitat Valenciana, located in Marjal dels Moros in the city of Sagunt. The event was attended by the founding members, representing the four pillars of open innovation on which the living lab methodology is based: academia, public administration, business, and citizens. Since its creation, the initiative has involved the Department of Language Theory and Communication Sciences of the Faculty of Philology, Translation and Communication and has received support from the Vice-Rectorate for Culture and Society of the Universitat de València. It has also involved public administrations such as Sagunt City Council and the Generalitat Valenciana; the Camp de Morvedre Business Association (Asecam); and, from civil society, several organisations including Acció Ecològica Agró, the oldest environmental organisation in the region, and Sapiencia, which is dedicated to scientific outreach. Other third-sector research organisations, such as Fundación Global Nature, which also develops several research projects in the wetland, have likewise participated.

9 <https://bggovernance.eu/>

The pillars of RossetaUVLab action are the following:

1. To promote citizen and stakeholder participation in decision-making processes related to biodiversity protection and climate-change adaptation in Sagunt, Camp de Morvedre, and l'Horta Nord, within the Palancia River basin, with special attention to the ecosystem of Marjal dels Moros and its surroundings, including the Environmental Education Centre of the Comunitat Valenciana and the industrial expansion of Parc Sagunt I and II.
2. To increase coordination among research actors whose mission is to improve the resilience of the natural, social, and economic systems of the region, while strengthening synergies among them and facilitating the involvement of diverse stakeholders.
3. To identify opportunities for ecological restoration, while promoting the adaptation of local ecosystems to climate change and the resilience of citizens to the effects of global warming.
4. To promote the creation of interdisciplinary research initiatives and the attraction of new funding sources, as well as an economic hub based on scientific knowledge linked to biodiversity, as inspiration for a model of competitiveness and entrepreneurship grounded in sustainability, the green transition, and social justice.
5. To facilitate knowledge transfer to different social actors and promote environmental values and ter-

ritorial governance in the current context of green and digital transition.

6. To promote citizen participation and social dialogue to increase public engagement with nature through innovative methodologies such as co-creation and gamification.
7. To innovate in the communication and dissemination of the values of biodiversity, ecological restoration, nature-based solutions, and ecosystem services, as well as global concepts such as climate change, territorial governance, and sustainability within the framework of the 2030 Agenda. At the same time, the initiative seeks to contribute to media literacy in the field of sustainability.

6. The Potential of cocreation in the promotion of sustainability

This chapter has sought to highlight the potential of open innovation and the co-creation methodology of living labs for knowledge transfer within the framework of the European Universities Initiative. It has reviewed key milestones in the role of university alliances in promoting sustainability across different areas of European higher education in response to the new challenges posed by the European Green Deal and the 2030 Agenda.

The culture of sustainability initiated by pioneering voices such as Rachel Carson, who sounded the alarm regarding the dominant model of progress and its impact on nature, is now part of the backbone of Euro-

pean university alliances. As shown above, sustainable development, green education, global warming, social justice, and the green transition are priorities for European higher education. Nevertheless, the involvement of all sectors of society remains essential for addressing the challenges of the United Nations 2030 Agenda. For this reason, living lab methodology, through the application of co-creation and governance in real-life environments and, on a small scale, is fundamental to the configuration of safe and trust-based spaces for dialogue in which the four pillars of open innovation converge: academia, public administration, business, and citizens.

Silent Spring was followed by many other initiatives and diverse environmental struggles that gradually shaped the collective imaginary of environmental protection and the priority of safeguarding the natural environment to guarantee the future of coming generations. These include figures such as Wangari Maathai, who promoted the *Green Belt Movement* in Kenya in the 1970s; more recent voices linked to the fight against climate change, such as Al Gore, through politics and public communication with the documentary *An Inconvenient Truth*; and young activists with a very representative icon, Greta Thunberg, founder of the movement *Fridays for Future*.

Chemicals such as DDT silenced birdsong and generated silent springs. Today, one of the major challenges is to continue looking at nature without the filter of screens, harmonising biodiversity protection

and pollution prevention with a green transition at a time when digital humanities and even environmental humanities are being increasingly claimed, in the face of the seductive and enriching universes opened up by artificial intelligence, and a new McLuhan's global village-, with its ups and downs, marked by ideological polarisation, deepfakes, and armed conflicts involving drone armies in today's post-truth society.

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CHAPTER 8

TERRITORIAL KNOWLEDGE ECOSYSTEMS

University of Burgundy Europe and the Co-Production of Hybrid Governance

Franck Dubois* and Stéphane Djahanchahi**

1. Introduction

Technologies, like ecosystems and the diversity of their components, lie at the heart of the development of scientific knowledge. To survey a variety of species, understand their roles and dependencies, and measure energy flows, these are activities around which scientific programs have been developed. These “non-human” entities¹, long relegated to the status of externalities by public decision-making, are now emerging as central agents in territorial trajectories and, ultimately, in our social organization. After long yielding ground to the market actors in the struggle over the definition of reality, the university has had to evolve, moving beyond its role as an administrator of knowledge production in order to “make the voice”² the flows governing our environment, perceptible only through technical

instruments: urban thermal transfers, the kinetics of atmospheric pollutants, or the microbial symbioses of viticultural terroirs and bring them into public debate.

First, we will clarify how the epistemological stance of the sociology of translation (Akrich et al., 2006) contributes to take non-human actors into account and analyzing them in terms of their interdependence, power relations, and subordination. Secondly, we will examine how sensors enable researchers to translate non-humans into actors to be considered within the rational organization of territory, in a form of hybrid governance between science and publics, where evidence is co-produced. Finally, we will see how the idea of “doing science” makes it possible to envision the university’s engagement toward a territorial engineering of knowledge, supported by the organization of its flows of scientific and technical communication. Together,

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1 Animal and plant species, pollutants, temperatures, energy flows, pollinators, and microorganisms impact our biotopes.

2 See François Cooren’s fruitful metaphor of ventriloquism in communication, which considers how certain entities are evoked and invoked in interactions (Cooren, 2010).

these elements constitute a process of translation, circulation, and interconnection enabling biological, environmental, and technical realities to be integrated into the social and political organization of territories.

2. Territorial Rationalities, Invisibilities, and the Circulation of Knowledge

2.1. Imaginaries of Social Organization

2.1.1. Knowledge and Power in the Rationalization of Territories

Contemporary societies maintain a paradoxical relationship with scientific and technical rationality. On the one hand, the multiscale organization of territories, infrastructures, public policies, and economic activities increasingly relies on specialized forms of expertise, on data production, and on measurement systems able to guide collective action. On the other hand, the phenomena that now structure a significant portion of social issues are almost impossible to perceive directly: atmospheric pollution, global warming, the circulation of microparticles, energy dependencies, the functioning of digital infrastructures, transformations in biodiversity, microbiological dynamics of soils...

The relationships between knowledge and power are governed by the ability to measure, interpret, and render intelligible certain phenomena - a central issue in social organization. Scientific knowledge no longer merely describes the world: it contributes to define public problems, prioritizing political agendas, and structuring capacities for intervention within territories.

2.1.2. Fragmentation of Expertise and Postmodern Complexity

Postmodern societies are characterized by a growing tension between the multiplication of expertise and the weakening of major unifying explanatory narratives³. Environmental, health, and technological controversies illustrate this increasing difficulty in stabilizing common interpretative frameworks (Beck, 1992). Knowledge appears fragmented among disciplines, institutions, economic actors, public authorities, and secular experiences.

This fragmentation encourages the development of pragmatic approaches to collective action. According to Dewey, actors are not concerned with “knowledge for knowledge’s sake,” but rather with knowledge to act: “Doing is knowing, knowing is doing”⁴. One example

3 See Jean-François Lyotard on the postmodern condition (Lyotard, 1979)

4 Excerpt from Daniel Cefai’s article examining pragmatism in collective action and the definition of public problems based on the work of Dewey, Park, and Mead. 2016, p. 28. (Cefai, 2016)

can be found in *The Transition Handbook* (Hopkins, 2008), transposed from the Commonwealth into the European Union, France, and particularly the Burgundy region⁵.

The challenge for knowledge-producing institutions is therefore to help organize the conditions for the circulation, translation, and collective appropriation of knowledge. Scientific knowledge must thus be considered not as autonomous productions separated from the social fabric, but as elements directly involved in organizing contemporary forms of territorial governance.

2.2. Making the Invisible Visible: Non-Human Actors and Translation Devices

2.2.1. The Invisibility of Contemporary Territorial Phenomena and Their Necessary Translation

A significant portion of the phenomena structuring contemporary territories remains imperceptible at the scale of ordinary experience. Air quality cannot be apprehended directly without specific measurement devices; urban thermal flows circulate largely invisibly; soil microbiota, atmospheric pollutants, or the energy consumption of digital systems escape from immediate perception. These phenomena, although not directly

perceptible to the ordinary senses, profoundly influence forms of social organization, public policies, and capacities for territorial resilience. Contemporary ecological and technological issues therefore rely on a constant extension of the scientific and technical mediations necessary for understanding reality.

Already, Pasteur's microbiological work consisted precisely in making the invisible visible, as Bruno Latour emphasized through the networking of laboratories, researchers, and measuring instruments⁶. Sensors, maps, simulation models, and indicators do not merely record pre-existing realities; they translate certain phenomena into formats capable of being integrated into collective action⁷.

Fine particles become public health indicators; residual heat from urban infrastructures becomes an energy resource; variations in biodiversity become objects of territorial management. Scientific devices thus transform biological, physical, or environmental phenomena into objects that are sometimes constraining, but nevertheless administrable and collectively debatable.

This capacity for translation plays a central role in contemporary forms of governance and balance of interests (G. Hardin, 1968; D. Bourg, 2025). Scientific and technical systems connect environmental or infrastructural phenomena to political, economic, and insti-

5 See also (Hopkins & Vermeulen, 2014)

6 Les microbes, Guerre et Paix. (Latour, 1984)

7 To examine the relevance and role of these different formats, see «Telling About Society» by Howard S. Becker (2007).

tutional decisions capable of modifying organizational behaviors and territorial dynamics.

2.2.2. The Limits of Datafication of Territory

These translation systems are never neutral. They select certain phenomena over others, produce hierarchies of visibility, and orient forms of territorial rationality. What is measured acquires a particular political existence, while other dimensions that are more difficult to quantify risk remaining marginalized if they have not been integrated into a development master plan⁸.

Scientific and technical instruments participate in power relations insofar as they determine the legitimate ways of describing collective problems. This dimension is particularly important in the environmental field. The multiplication of sensors and monitoring systems may foster a better understanding of ecological interdependencies, but it may also contribute to the technicization of political and social issues. One example can be found in the transfer of water management to intermunicipal authorities (French federation of municipalities)⁹.

The growing production of data guarantees neither democratic openness in decision-making nor equitable

distribution of capacities for action. Knowledge infrastructures remain riddled with asymmetries of expertise, institutional dependencies, and economic logics likely to orient territorial priorities. We may even observe a phenomenon of cognitive saturation capable of generating interest groups opposed to IPCC reports¹⁰.

2.3. From the Disciplinary University to the Interface University

2.3.1. Disciplinary Boundaries and Mediation Infrastructure

In this context, the role of the university is undergoing profound change. Long structured around relatively autonomous disciplines and highly specialized forms of knowledge production, the university now faces issues that largely exceed traditional academic boundaries. Energy, environmental, food-related, digital, and health issues simultaneously mobilize necessarily transversal skills drawn from experimental sciences, humanities and social sciences, biology, engineering, and computer science.

The territorial issues studied in this chapter instead reveal configurations in which knowledge is construc-

8 Deliberation of the Academic Council of the University of Burgundy Europe, Master Plan for Student Life, 03/12/2025.

9 Emmanuelle Renaud-Hellier, "Water management and urban growth in Dijon: which model of regional integration?", *Revue Géographique de l'Est*, vol. 46 / 1-2 | (2006).

10 Alexandre Goudier. Mise à jour des indicateurs climatiques et d'impact du changement climatique à destination des acteurs locaux de Bourgogne-Franche-Comté. Agronomie (2025).

ted through interaction systems among actors who were formerly compartmentalized. The university therefore appears less as an isolated area of knowledge production than as a mediation interface between heterogeneous actors. The initiatives developed in Dijon and Burgundy illustrate this transformation. Projects related to the “biodiversity life” of the campus resonate with regional development by relying on interdisciplinary and territorialized forms of cooperation. Laboratories no longer produce knowledge intended solely for external dissemination; they participate in co-construction processes in which scientific knowledge interacts with practical knowledge, technical constraints, economic compromises, political objectives, and environmental realities.

2.3.2. Hybrid Governance and Persistent Asymmetries

The university thus becomes an infrastructure for the circulation of knowledge. This circulation concerns not only scientific publications or technological innovations, but also the ability to translate between different registers of action solicited by the economic and social environment with local actors. This transformation should not, however, be interpreted as the disappearance of power relations or institutional asymmetries.

Participatory and interdisciplinary systems continue to be fraught with questions of scientific legitimacy, funding, hierarchization of expertise, and governance. The opening of knowledge-production processes does not eliminate inequalities in access to cognitive and technical resources. Rather, it reconfigures how different actors may participate in defining collective problems and the territorial responses brought to them.

The territorialization of knowledge thus appears as an ambivalent process: it may foster the circulation of knowledge and broaden spaces of participation, while simultaneously producing new forms of dependence on technical infrastructures, expertise systems, and institutional capacities for coordination.

3. Territorializing Knowledge: Devices, Mediations, and Experimentations

3.1. Territorial Ecology and highlighting the Interdependencies of Living Systems

3.1.1. The University Campus as an Experimental Area

The awarding of the EcoJardin label to the Montmuzard campus illustrates this evolution¹¹. The project brings together heritage services, biology researchers, and stu-

11 Préservation de la biodiversité et gestion des espaces verts sur le campus Montmuzard—Université Bourgogne Europe. (2025, June 19). <https://www.ube.fr/preservation-de-la-biodiversite-et-gestion-des-espaces-verts-sur-le-campus-montmuzard/>

dents discussing a reconfiguration of the methods used to manage university green spaces. The gradual abandonment of chemical inputs modifies the relationships between the university institution and local ecological dynamics. Spontaneous flora, campus fauna, and the biological cycles of soils cease to be regarded merely as decorative elements or variables to be strictly controlled. They become indicators of ecological resilience and support for collective learning.

The campus thus functions as a territorial demonstrator. Knowledge produced in biology or ecology research centers finds concrete translation in the design of the university areas themselves. This configuration contributes partially to reduce the separation between scientific production and the everyday environment. Students, staff, and visitors are confronted with the visible transformations of space revealing ecological issues often treated abstractly in institutional discourse.

3.1.2. Translating Environmental Measurements to Inform Decision-Making

Environmental measurement systems play a central role in transforming certain invisible phenomena into objects of collective action. The Center of Urban Climate and Air Quality in Dijon, led by the House of Social

Sciences and Humanities and teacher-researchers in spatial planning, illustrates this dynamic of scientific translation of atmospheric realities¹². The project brings together geographers, computer scientists, and citizens around low-energy sensors able to measure fine particle concentrations and various atmospheric indicators. Air pollution constitutes a particularly revealing example of the contemporary difficulties involved in perceiving environmental risks. The effects of microparticles on health are widely scientifically documented, yet their presence remains imperceptible in the ordinary experience of inhabitants.

The approximately 300 sensors distributed across the metropolitan area therefore make it possible to transform air into an object that can be measured, visualized, and collectively discussed. The data produced helps construct territorial representations of pollution that can be mobilized in public policies related to urban planning, mobility, or environmental health. The role of citizens evolves within the production of knowledge. By participating in the installation or observation of sensors, inhabitants become partial actors in environmental monitoring. Scientific evidence therefore tends to be co-constructed through hybrid systems combining academic expertise and citizen or lay participation. However, the production of data does not guarantee

12 Jégou, A., Martiny, N., Richard, Y., & Thévenin, T. (2024). La métropole sous observation environnementale: L'observatoire climat urbain et qualité de l'air à Dijon. Autrement

the capacity for political action. Phenomena become more visible without the institutional or economic means necessary for their transformation being available. Scientific visibility of risks therefore eliminates neither political trade-offs nor territorial inequalities in the face of environmental nuisances.

The ProDIJ project¹³: *Sustainable Food Dijon 2030*, developed within the framework of the Dijon Métropole Territorial Food Project, illustrates the issues surrounding the relationships between agriculture, food, health, and ecological resilience of territories: thinking food resources from soil to plate, as seen in the political stakes of communication around sustainable food (Hugol-Gential, 2023). The project brings together researchers from the National Institute for Agricultural, Food and Environmental Research (INRAE) and from the university, farmers, and territorial authorities centered on a reflection on the transformation capacities of local food systems. Soils, microbiota, seeds, and agricultural biological dynamics become central elements of territorial governance. The quality of agricultural land is no longer viewed solely from the perspective of economic yield, but as an ecological infrastructure conditioning future capacity for food autonomy and environmental resilience.

This approach is part of a “global health” logic linking public health, care, ecosystem health, and the organization of productive systems. Biological and social interdependencies thereby become objects of coordination between scientific, agricultural, and institutional actors. Supported by competitiveness clusters such as Vitagora and Agronov¹⁴, the project also contributes to the emergence of new forms of territorial entrepreneurship centered on short supply chains, more sustainable agriculture, or agricultural technologies. Nevertheless, this dynamic cannot be reduced to a simple logic of economic innovation. Transformations in food systems involve complex compromises between ecological imperatives, the economic constraints of farms, local processing and sales systems, consumption habits, and territorial public policies.

The scientific visibility of ecological interdependencies, through measurement, analysis, and publication, therefore, does not mechanically produce consensual forms of transition. Rather, it contributes to shift the terms of collective debates by integrating biological and environmental temporalities more fully into territorial decision-making processes.

13 <https://prodij.metropole-dijon.fr/> ; <https://msh-dijon.ube.fr/prodij-dijon-alimentation-durable-2030/>

14 Vitagora, agri-food & innovation cluster ; <https://www.vitagora.com/> and Agronov, innovation hub in agroecology ; <https://agronov.com/>

3.2. Energy Flows, Digital Infrastructures, and Territorial Rationalization

3.2.1. Governing Territories Through Data in the Face of Infrastructural Interdependencies

The Metropolitan Urban Heating Network of Dijon¹⁵ constitutes an example of connecting territorial infrastructures through the circulation of previously underutilized energy flows. The system is based on the interconnection between urban facilities, public transport networks, health infrastructures, the university, and thermal recovery systems. Residual heat produced by certain urban activities—the tramway, for example—thus becomes an energy resource reinjected into the network to optimize the functioning of other territorial infrastructures. This logic of circularity transforms the way territories conceive energy residues and institutional interdependencies. Dijon thereby becomes a European demonstrator of an energy-producing and carbon-neutral district. The heating network material-

izes a form of territorial symbiosis in which infrastructures cease to be conceived as autonomous systems. Hospitals, housing complexes in priority urban districts, urban transport systems, university buildings, and metropolitan facilities appear, within a networked mesh, as interdependent elements of a single energy ecosystem. Energy infrastructures therefore appear as dealing areas between different territorial rationalities rather than as simple technical solutions to climate issues¹⁶.

The RESPONSE projects and the Smart City Chair¹⁷ extend this dynamic by mobilizing digital territorial management systems based on data, intelligent networks, and predictive models. Bringing together researchers, industrial actors, and smart-city experts, these initiatives develop systems capable of optimizing urban energy and information flows in real time, as well as simulation tools and digital twins capable of modeling the potential effects of urban decisions on territorial environments¹⁸.

These systems contribute to an increasing rationalization of urban management methods. Infrastructures

15 <https://www.dijon-metropole.fr/dijon-metropole-a-votre-service/reseaux-de-chaleur-urbain/>

16 Berger, A., Poupelin, M., Crétat, J., Pergaud, J., Pohl, B., Rega, M., & Richard, Y. (2024). Contribution of high-resolution atmospheric simulation to understand air temperature and UHI during the summer 2022 heat waves in Dijon. *37ème Colloque Annuel de l'Association Internationale de Climatologie*. <https://ube.hal.science/hal-04627804>

17 RESPONSE aims to establish a strategic vision for Smart Cities Energy Transition: Climate-neutral cities by 2050. The idea is to turn energy sustainability into a doable vision by solving the energy trilemma (security, equity/affordability, environmental sustainability) at building, block and district levels in smart cities. RESPONSE supports the lighthouse cities of Dijon (FR) and Turku (FI) and their Fellow cities Brussels (BE), Zaragoza (ES), Botosani (RO), Ptolemaida (GR), Gabrovo (BU) and Severodonetsk (UA) <https://h2020response.eu/>

18 Lanna, M., & Py, E. (2023). *Smart City et prise de décision* (p. 238). Mare & Martin. <https://hal.univ-lorraine.fr/hal-04412882>

become capable of producing automatic or semi-automatic adjustments based on continuously collected data. Territories are then conceived as sets of flows susceptible to optimization through algorithmic systems.

3.2.2. The Environmental Materiality of the Digital World

The development of contemporary digital infrastructures is based on a growing contradiction between the apparent dematerialization of uses and the environmental materiality of technical systems. Data flows, often perceived as immaterial, require infrastructure that consumes large amounts of energy and material resources.

The Green Data Center¹⁹ project developed at the university illustrates this progressive consideration of the environmental costs of digital technology. Bringing together the digital department, ministerial, regional representatives, and industrial partners, the initiative aims to experiment with and develop less energy-intensive computing architectures while optimizing the thermal flows produced by computer infrastructures. This approach contributes to a territorial re-inscription of the digital sphere. Servers, cooling systems, and electricity consumption cease to be considered merely invisible technical supports; they become objects of

environmental reflection and institutional governance. This project highlights the ambiguities of contemporary digital sobriety policies. Gains in energy efficiency can help reduce certain local or thematic consumption patterns while simultaneously supporting the continued expansion of digital uses and volumes of data processed. Strategies of technical optimization therefore do not necessarily challenge the global dynamics of growth in digital infrastructures.

However, this logic of data-driven governance raises several critical questions. Territorial management systems rely on implicit choices concerning the indicators considered relevant, the environmental priorities selected, or the acceptable compromises between different categories of users. The partial automation of decisions may also reinforce certain forms of technical opacity and shift centers of power toward actors controlling digital infrastructures and data-processing capacities. Smart city technologies do not erase conflicts of interest or political choices; rather, they tend to rephrase them in technical language which can make the underlying social compromises less visible.

The digitization of territories should therefore not be interpreted as a neutralization of urban political issues, but rather as a transformation of the methods by which these issues are debated and governed.

19 <https://www.ube.fr/green-data-center-du-numerique-vert/>

4. Doing Science: Knowledge, Engagement, and Territorial Reappropriation

4.1. Doing Science as a Collective Experience of Reality

4.1.1. The Contemporary Distance Between Science and Ordinary Experience

Climate models, energy-management algorithms, digital infrastructures, urban simulations, or certain representations derived from contemporary physical sciences all play a concrete role in the organization of territories while remaining difficult to master outside of specialized and simulated expert environments.

This situation produces a form of dissociation between the growing place of scientific knowledge within mechanisms of governance and the capacity of individuals to concretely represent the phenomena involved. Scientific imaginaries and certain forms of technological forecasting may contribute to reinforce this symbolic distance between science and society. Science then appears as a domain reserved for specialists, difficult to access through lay experience. This growing abstraction is not without consequences for forms of collective adherence to environmental, energy, or technological policies. When phenomena remain

invisible, and instruments of understanding appear reserved for expert communities, citizens' ability to take ownership of territorial issues tends to decrease. Scientific rationality may then be perceived as external to ordinary social experiences rather than as a collective resource for making reality intelligible.

The territorial initiatives studied in this chapter nevertheless reveal the emergence of systems capable of partially reducing this distance between scientific knowledge and ordinary experience. Participatory science approaches, living labs, environmental experimentations, and collaborative measurement systems are based on the idea that understanding phenomena also requires forms of practical engagement and the provision of tools adapted to citizen decision-making²⁰.

Observing air quality, experimenting with ecological modes of managing living systems, participating in territorial diagnostics, or visualizing urban energy flows modifies the conditions by which scientific knowledge is appropriated. The public is no longer placed solely in a position of receiving knowledge produced elsewhere; people participate, at least partially, in the chain of observation, manipulation, and translation that render certain phenomena intelligible.

20 Cyril Masselot. *Processus info-communicationnels en intelligence territoriale : des données aux transitions. H.D.R. en Sciences de l'information et de la communication*. Université Bourgogne - Franche-Comté, (2024). <https://inti.hypotheses.org/>

4.1.2. Territorial Initiatives and the Limits of Participation

This dynamic does not mean the disappearance of differences in expertise between researchers and citizens. It nevertheless contributes to shifting forms of scientific legitimacy toward more open configurations in which territorial experience, practical observation, and practical knowledge can interact with academic systems of knowledge production. The initiatives studied therefore show that adherence to environmental or territorial transformations depends less on the mere dissemination of information than on the possibility given to actors to concretely experience the interdependencies structuring their everyday environment.

This partial reappropriation of scientific knowledge nevertheless remains unevenly distributed. Participatory systems mobilize cultural, temporal, and technical resources that are not equally accessible to all audiences. The most active forms of participation frequently involve populations already relatively familiar with environmental issues or scientific approaches. Moreover, involving citizens in data production or certain territorial governance systems may also contribute to shifting certain public responsibilities onto individuals themselves. Contemporary logics of participation sometimes fit within broader forms of governance based on activating individual behavior and encouraging user responsibility. The circulation of knowledge therefore eliminates neither social asymmetries nor the

power relations that permeate scientific and technical infrastructures. Rather, it transforms the way in which individuals may access capacities for interpreting reality and participate in defining collective problems.

4.2. From Material Consumption to Cognitive Valorization

4.2.1. The Cultural Contradictions of Postmodern Societies

Contemporary societies maintain an ambivalent relationship with progress and rationality. Although their organization increasingly relies on the production of scientific and technical knowledge, mechanisms of social valorization remain strongly structured around logics of material consumption and the appropriation of goods (Bourg et al., 2016). This situation produces a form of cognitive dissonance: societies present themselves as rational while largely orienting mechanisms of social recognition toward possession, accumulation, or consumerist uses of technical objects. Knowledge itself often becomes invisible behind the systems it makes possible. In this context, contemporary environmental issues challenge societies' capacity to revalue other forms of relationship to the world based not only on material appropriation, but also on understanding ecological, technical, and social interdependencies. The territorial initiatives studied suggest the existence of another possible form of engagement based on the

cognitive valorization of observed phenomena. Understanding soil dynamics, visualizing energy flows, observing the evolution of biodiversity, or interpreting environmental data may themselves constitute forms of social experience (Galibert et al., 2014).

This dimension refers back to an older relationship between knowledge and adaptation to the environment. Human societies long depended on refined abilities to observe traces, natural rhythms, and environmental interdependencies. Attention to transformations in living systems then constituted a direct condition for survival and collective organization.

4.2.2. Knowledge as Territorial Infrastructure

The transformations studied in this chapter ultimately lead to considering flows of knowledge as fully-fledged territorial infrastructures. Environmental data, measurement systems, scientific cooperation networks, digital platforms, and participatory spaces now directly structure the organizational and coordination capacities of territories. Contemporary forms of scientific mediation may therefore be interpreted as attempts to partially reactivate this cognitive relationship to territory. Environmental participation systems, citizen observatories, and territorial experimentations do not merely produce data; they also contribute to transform the ways actors

perceive their environment and their place within the systems of interdependence that structure it.

This revalorization of understanding as a social experience does not, however, constitute a return to an idealized harmonious relationship with nature. It takes place within highly technologized and institutionalized environments where scientific and digital mediations remain central. This therefore ongoing reflection on the condition of access to knowledge, the forms of visibility produced by technical systems, and the asymmetries they may generate.

Knowledge transfer can therefore no longer be reduced solely to the economic valorization of innovation or technological transfer between universities and businesses. More broadly, it concerns the circulation of capacities for interpreting, understanding, and interconnecting the phenomena that make up contemporary territories²¹.

From this perspective, the university appears as a mediation institution capable of partially organizing these circulations among scientific actors, public institutions, businesses, technical infrastructures, and non-specialized publics. Its role is no longer limited to the production of disciplinary knowledge but also involves contributing to the structuring of collective conditions for understanding environmental, energy, and social transformations.

21 Lucie Dupré, François Jarrige, Antoine Lagneau, Yannick Sencébé et Jean-Louis Tornatore, Pour les jardins de l'Engrenage, contre la politique du béton à Dijon, atelier transitions, *Penser les transitions*, 24 avril 2021. <https://transire.hypotheses.org/656>

5. Conclusion

The territorial initiatives studied in this chapter show that contemporary relationships between universities and territories cannot be reduced to a linear logic of technological transfer or top-down dissemination of knowledge. The observed systems instead bring together a plurality of human and non-human actors in configurations where scientific production, territorial governance, technical infrastructures and citizen participation become closely interdependent.

Projects related to biodiversity, air quality, energy networks, digital infrastructures, or local food systems all illustrate, to varying degrees, attempts to make phenomena perceptible which were previously barely visible in public space. The scientific and technical systems studied do contribute to constructing new forms of territorial intelligibility that enable environmental, biological, or energy issues to be integrated into collective decision-making processes.

This evolution also transforms the role of the university, which becomes capable of navigating uncertainty, breaking disciplinary silos in order to irrigate the territory and co-construct a measurable physical reality by doing science with citizens and ecosystems. The institution appears less as an autonomous space for producing specialized knowledge than as a mediation interface between disciplines, infrastructures, institutions, and publics. Knowledge circulates through hybrid networks associating researchers, local author-

ities, businesses, citizens, sensors, data, and technical systems.

However, these dynamics should not be interpreted as the spontaneous emergence of harmonious forms of collaborative governance or shared technological rationality. Knowledge infrastructures remain riddled with asymmetries of expertise, institutional dependencies, political compromises, and economic factors that may limit the effective openness of decision-making processes. So-called “smart” territories therefore appear less as spaces entirely controlled by technologies than as environments where capacities for perception, coordination, and understanding of interdependencies themselves become central issues of governance.

From this perspective, the territorial knowledge ecosystems studied in this chapter invite us less to think about the automation of decisions than about the transformation of the collective conditions for highlighting reality. The challenge is therefore not merely to produce more data or technical innovations, but to construct shared forms of intelligibility regarding the ecological, social, and infrastructural interdependencies that structure contemporary territories.

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CHAPTER 9

INTENTIONAL RESEARCHER DEVELOPMENT AS UNIVERSITY GOVERNANCE

The FORTHEM Progression Matrix

Agnese Rusakova*

1. Introduction: from researcher training to governance for transformation

The European Universities Initiative has shifted the policy imagination of higher education cooperation. Alliances are no longer expected only to facilitate mobility, visibility and networking; they are also asked to contribute to the long-term integration of education, research, innovation, skills development and societal engagement. In this context, institutional transformation is not simply a matter of new strategies or additional projects. It depends on whether universities can create repeatable practices that change how people collaborate, how responsibilities are distributed, and how academic careers are understood.

Researcher development is therefore a governance issue. In many institutions, support for doctoral candidates and postdoctoral researchers is organised as a set of training opportunities: grant writing, open science, supervision, publishing, communication, entrepreneur-

ship, or career planning. These activities are important, yet they are often treated as services delivered to researchers rather than as pathways through which researchers become contributors to institutional and alliance-level transformation. The risk is that early-stage researchers remain positioned as beneficiaries of capacity-building while the work of institutional change is reserved for senior leadership, research managers, and established academics.

This chapter starts from different premises. It argues that early-stage researchers can be intentionally positioned as co-creators of institutional and alliance capacity if universities design developmental pathways that connect skills, identity, responsibility and recognition. The aim is not to impose additional labour on researchers, but to make visible how their growth can be aligned with the transformation goals of European University Alliances. The chapter addresses three questions: How can researcher development be conceptualised as a progression from individual capability

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to system-level stewardship? Which governance conditions support the critical transition from unit contribution to institutional co-creation? How can FORTHEM, and particularly the FORTHEM Academy for Early-Stage Researchers, operationalise such a pathway within a nine-university alliance?

2. Conceptual basis: researcher development as institutionalization

The proposed framework brings together four conceptual traditions. First, communities of practical theory understand learning as participation in socially situated communities rather than as the acquisition of isolated skills (Wenger, 1998). Applied to researcher development, this means that doctoral candidates and post-doctoral researchers learn not only by attending courses, but by moving between communities of practice: research groups, departments, university structures, alliance networks and wider innovation ecosystems.

Second, institutional theory and sensemaking perspectives draw attention to how actors interpret organisational roles and rules (Scott, 2014; Weick, 1995). A researcher who sees the institution only as a funder, employer, or administrator will act differently from a researcher who sees the institution as a collective capacity that can be strengthened through their own work. This interpretive shift is at the heart of the progression matrix. It is especially important in European Univer-

sity Alliances, where cooperation takes place without a single hierarchy and shared routines must be built across autonomous universities.

Third, research on academic identity highlights that professional development involves the construction of belonging, legitimacy, and autonomy, not only the accumulation of outputs (Henkel, 2005). Early-stage researchers are often asked to be excellent individuals, strong team members, international collaborators, and socially engaged academics at once. A progression model can reduce ambiguity by making explicit which form of contribution is expected at each developmental stage and which forms of support and recognition correspond to it.

Fourth, work on team science and innovation ecosystems helps explain the movement from individual expertise to interdisciplinary, inter-institutional, and societal collaboration (Etzkowitz & Leydesdorff, 2000; National Research Council, 2015; Stokols et al., 2008). At higher levels of the matrix, the researcher is not only a participant in collaboration but a steward of conditions that make collaboration possible: trust, translation, stakeholder engagement, resource mobilisation and shared purpose.

3. Material and approach

This chapter is a conceptual and design-oriented contribution. It does not present primary empirical data,

and it does not claim to validate the matrix statistically. Instead, it develops a mechanism-oriented framework from three sources: European policy and research literature on university alliances and research careers; publicly available FORTHEM documentation on the research dimension, researcher careers, research assessment and alliance strategy; and the author's conceptual work on the Researcher Development Progression Matrix.

The approach is close to an illustrative case logic. FORTHEM is used not as a single empirical case from which causal claims are inferred, but as a relevant institutional setting in which the framework can be made concrete. We seek to identify mechanisms that may be transferable to other alliances while avoiding claims of statistical representativeness. Descriptive statements are therefore limited to documented structures and activities, while broader implications are formulated as propositions for governance design.

The analytical procedure involved four steps. First, the policy problem was defined: European University Alliances need durable forms of research integration, but researcher development is often treated as a training service rather than as a transformation pathway. Second, relevant theoretical lenses were mapped to the problem: communities of practice, institutional sense-making, academic identity, and ecosystem collaboration. Third, the five levels of the matrix were refined as a sequence of responsibility and recognition. Fourth, FORTHEM activities were interpreted as possible transition spaces through which early-stage researchers can

move from skills acquisition to institutional and ecosystem stewardship.

4. The FORTHEM Researcher Development Progression Matrix

The FORTHEM Researcher Development Progression Matrix describes five maturity levels. It should not be read as a rigid hierarchy of personal value or as a linear career ladder. Researchers may operate at different levels in different contexts, and progression may be uneven across disciplines, institutions, and life stages. Its purpose is to support governance reflection: What kind of contribution is currently expected from researchers? Which level is institutionally rewarded? Which structures make the next level possible?

Level 1 is individual professional growth. The researcher's dominant question is: How do I develop? Success is associated with publications, project deliverables, training completion, and the construction of an individual academic profile. This level is necessary because without individual competence, there is no basis for broader contribution. However, if institutions recognise only Level 1 outputs, they risk producing isolated excellence without collective capacity.

Level 2 is unit contribution. The researcher understands that their work contributes to a laboratory, research group, department, or doctoral school. Collaboration becomes more meaningful, resources may be shared, and success is linked to unit performance. Level

2 is often where doctoral and postdoctoral researchers first learn teamwork, supervision cultures, and collective responsibility. Yet the frame remains bounded by the immediate unit.

Level 3 is institutional co-creation. Here, the researcher begins to ask how their work strengthens the university. They may contribute to cross-departmental initiatives, represent the institution externally, help build partnerships, support shared infrastructures, or participate in university-level working groups. The key shift is from institutional client to institutional actor. The university is no longer seen only as the provider of resources; it becomes a collective project to which the researcher can contribute.

Level 4 is ecosystem stewardship. The researcher connects institutional strategy to societal, regional, or sectoral impact. They work with external partners, contribute to policy or innovation processes, and help translate research into public value. In the context of FORTHEM, thematic Labs and regional innovation pathways may serve as spaces where such ecosystemic thinking can be practised.

Level 5 is international system shaping. Researchers operating at this level contribute to international agendas, cross-border platforms, European frameworks, consortia, or policy debates. The scale of responsibility moves beyond participation in the international system toward shaping the rules, standards and infrastructures through which science and innovation are organised.

The value of the matrix is that it links development, governance, and recognition. Each level implies a different answer to three questions: Who is the researcher responsible to? What form of collaboration is expected? What kind of achievement is recognised? These questions make researcher development visible as an institutional design challenge rather than as an individual adaptation problem.

5. Operationalising the matrix through FA4ESR

The FORTHEM Academy for Early-Stage Researchers can be interpreted as a stewardship mechanism for the progression matrix. A stewardship mechanism is more than a training programme. It creates conditions under which researchers can take responsibility for increasingly wider communities, while still receiving support, mentoring, and protection appropriate to their career stage. Certification should therefore be understood not only as confirmation of participation, but as documentation of learning outcomes and observable shifts in thinking related to collaboration, responsibility and institutional contribution. From a governance perspective, such certification can also function as a structured evidence base for institutional decision-making. It can help universities identify emerging researcher profiles, map developmental needs across units, recognise forms of contribution that are otherwise invisible, and align training provision with institutional strategy.

At the alliance level, aggregated certification evidence can support joint planning by showing where partner universities have complementary strengths, where shared resources are needed, and how researcher development activities contribute to broader goals such as transnational cooperation, societal engagement and institutional transformation. In this sense, certification becomes not only an individual record of learning but also a governance instrument for steering researcher development pathways across the alliance ecosystem. It also creates a basis for demonstrating impact: how researchers move from participation to collaboration, institutional contribution, and societal engagement. Certification can make visible the effects of researcher development that are often difficult to capture through conventional output indicators.

At the lower levels, FA4ESR activities can strengthen individual and unit-based capabilities. Training in open science, research data, proposal writing, publication strategies, or transferable skills supports Level 1 development and prepares researchers for Level 2 collaboration. Such training becomes more transformative when it is connected to shared practices across the alliance: common expectations, peer learning, cross-border cohorts and a language of mutual responsibility.

At the Level 2 to Level 3 threshold, activities such as science communication, MSCA preparation, international summer schools, structured mobility, and internships can become institutional identity labora-

tories. They invite researchers to articulate how their work contributes not only to their curriculum vitae or research group but also to the university's reputation, strategic partnerships and European role. When these activities are linked to genuine institutional tasks, they help researchers practise representation, translation, and institutional contribution. Virtual international collaboration spaces such as FORTHEM Labs further deepen this transition by exposing researchers to other institutional cultures, allowing them to recognise their own academic identity in relation to peers, practices, and priorities from other universities.

At Levels 3 and 4, FORTHEM Labs and alliance-level thematic spaces can function as living transition spaces. They bring together researchers, students, and external partners around societal challenges and require participants to work across disciplinary and institutional boundaries. For early-stage researchers, this is especially important because it offers responsibility without immediate dependence on formal hierarchy. They can learn how to convene, translate, negotiate, and build trust before they hold senior academic positions.

At Levels 4 and 5, the academy logic should connect to proposal pipelines, policy engagement, research assessment reform, and alliance strategy. ERC and other advanced proposal-development formats can be used not only to improve grant success but to rehearse system-level thinking: What problem matters beyond one institution? Which partnerships are needed? What kind

of infrastructure is required? How does research contribute to European knowledge capacity? In this sense, FA4ESR becomes a bridge between career support and alliance governance.

6. Discussion: The Level 2 to Level 3 transition as a governance challenge

The most critical transition in the matrix is the movement from Level 2 to Level 3. At Level 2, researchers are already productive members of a team or unit. They may publish, teach, supervise, contribute to projects, and support colleagues. Yet they may still experience the university as a distant structure that evaluates, administers, or funds their work. Level 3 requires a different form of sensemaking: I am part of the institution's capacity to act.

This transition cannot be achieved through training alone. It requires structural positioning. Early-stage researchers need meaningful roles in committees, working groups, communities of practice, alliance activities, communication formats, peer mentoring, proposal development, and external engagement. These roles must be real enough to create responsibility, but safe enough not to expose researchers to unrealistic burdens or symbolic tokenism. They must also create opportunities to work across disciplinary boundaries, because institutional identity is unlikely to emerge if researchers remain confined to the logic and networks of their own unit.

It also requires leadership signalling. If leaders communicate only that early-stage researchers must prove themselves, the dominant logic remains individual competition. If leaders communicate that researchers are invited to create value with the institution, the relationship changes. The issue is not rhetoric alone; leadership signals must be matched by time allocation, mentoring, recognition, and access to information. They must also challenge the assumption that institutional contribution is secondary to disciplinary achievement.

Finally, the transition requires recognition systems. Research assessment reform is relevant here because many activities that build institutional and alliance capacity - collaboration, open science, mentoring, stakeholder engagement, science communication, data stewardship and proposal development - are poorly captured by narrow publication metrics. If these activities remain invisible in assessment, Level 3 and Level 4 behaviours will depend on voluntary overwork. A progression matrix can help institutions define what they wish to recognise and how this recognition can be embedded in career development.

7. Implications for European University Alliances

The matrix has four practical implications for alliances that want to transform their institutions through intentional researcher development. First, alliances should design pathways rather than isolated events. A course,

internship, summer school, or masterclass gains strategic value when it is explicitly linked to a transition between levels. This allows participants and organisers to ask what kind of responsibility is being practised and what evidence of growth is being produced.

Second, alliances should treat early-stage researchers as boundary spanners. Because they move between supervisors, research groups, institutions, mobility settings, and professional futures, they are well placed to notice fragmentation and to build bridges. However, this potential becomes institutional capacity only if alliances create visible channels through which researchers can contribute to strategy, communication, and evaluation.

Third, alliances should integrate researcher development with research management. The professionalisation of research support is not separate from researcher development; it is part of the infrastructure that makes progression possible. Researchers can only move towards Level 4 and Level 5 if they understand funding architecture, consortium building, ethics, data governance, stakeholder engagement, and the administrative conditions of cross-border cooperation.

Fourth, alliances should protect diversity of pathways. Not all researchers will or should become international system shapers. Some will contribute most strongly through disciplinary depth, local engagement, excellent teaching, infrastructure stewardship, public communication, or regional partnerships. The matrix

is useful only if it expands recognition rather than creating a new narrow hierarchy. Its purpose is to make multiple forms of contribution visible and to align them with institutional transformation.

8. Limitations and future development

The matrix remains a conceptual framework. It requires empirical validation before it can be used as an assessment instrument. Future research should test how researchers interpret the levels, whether the descriptors are meaningful across disciplines, and which institutional conditions enable or block progression. Longitudinal portfolio studies, reflective interviews, peer observation, and comparative alliance analysis would be especially useful.

A second limitation concerns institutional readiness. The framework assumes that universities are willing to share responsibility with early-stage researchers. In practice, however, universities are autonomous institutions only within the boundaries of national legal, funding, employment, and quality assurance frameworks; consequently, their capacity to act as European-level transformation actors is often mediated, delayed, or constrained by national conditions. In hierarchical or highly fragmented settings, Level 3 opportunities may therefore be scarce. Implementation requires parallel institutional development: governance structures, mentoring capacity, workload recognition, and leadership commitment.

A third limitation concerns power and care. Inviting early-stage researchers into institutional co-creation can be empowering, but it can also become exploitative if additional responsibility is not accompanied by agency, time, and recognition. Stewardship must

therefore include protection. The question is not how to extract more institutional work from researchers, but how to create conditions in which their development and the institution’s transformation reinforce each other.

Table 1: Condensed FORTHEM Researcher Development Progression Matrix

Level	Thinking paradigm	Main contribution	Typical collaboration	Governance task
1. Individual growth	I am growing.	Builds individual competence, publication capacity, and academic confidence.	Supervisor-led or small-scale collaboration.	Provide structured guidance, feedback, and basic career support.
2. Unit contribution	With me, the unit becomes successful.	Contributes to the performance, culture, and shared resources of a group, lab, or department.	Teamwork within a unit.	Recognise teamwork and create bridges beyond the unit.
3. Institutional co-creation	My contribution strengthens the university.	Builds institutional reputation, partnerships, infrastructure, and strategic capacity.	Cross-unit and university-level collaboration.	Gives researchers real roles in governance, representation, and strategy implementation.
4. Ecosystem stewardship	I strengthen the university’s impact in society.	Connects institutional research capacity with societal, regional, policy, or innovation ecosystems.	Interdisciplinary and inter-institutional collaboration with external partners.	Support boundary-spanning, stakeholder engagement, and impact pathways.
5. International system shaping	I shape the international science and innovation system.	Contributes to European or global agendas, platforms, consortia, standards and policy frameworks.	Cross-border, interdisciplinary and inter-institutional ecosystems.	Enable strategic autonomy, agenda-setting and international leadership.

The levels should be read as developmental orientations, not as fixed categories of personhood or formal job grades.

9. Conclusion

European University Alliances are laboratories for institutional transformation, but transformation depends on people who can inhabit new roles. This chapter argued that researcher development should be understood as one of the governance mechanisms through which alliances create durable capacity. The FORTHEM Researcher Development Progression Matrix offers a language for this work. It shows how researchers may progress from individual growth to unit contribution, institutional co-creation, ecosystem stewardship, and international system shaping.

The central contribution of the matrix is not the classification of researchers, but the clarification of institutional responsibility. If universities expect early-stage researchers to think institutionally, collaborate across borders and contribute to societal impact, they must design structures in which such behaviours can be learned, practised and recognised. FA4ESR provides a promising setting for this work because it connects training, mobility, mentoring, science communication, proposal development, and thematic collaboration across the FORTHEM Alliance.

For alliances seeking to transform their institutions in line with European higher education and research policy, the key lesson is simple: researcher development is not a peripheral service. It is a pathway through which universities learn to become European, collaborative, and impact-oriented institutions. Intentional

progression design can help make that pathway visible, governable, and shared.

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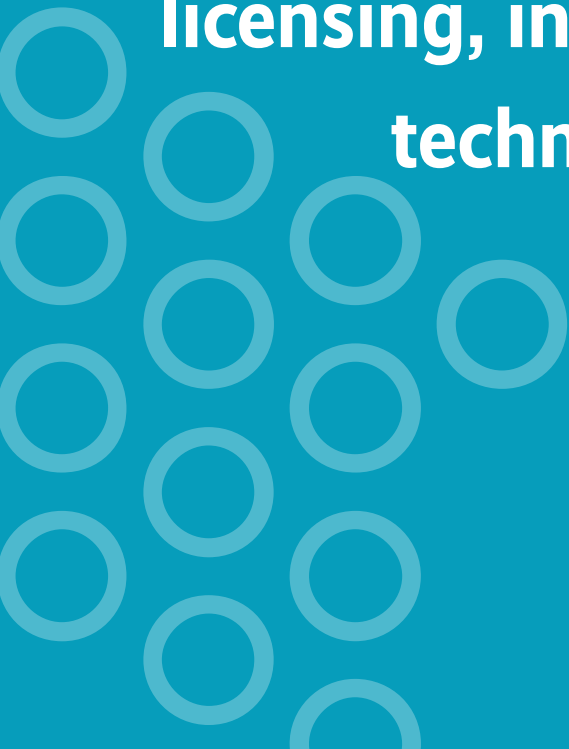
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PART II: BEST PRACTICES

THEMATIC AREA 1:

**Boosting research-based solutions
and their exploitation by local SMEs:
valorization models, spin-offs,
licensing, incubation and acceleration,
technology transfer offices, etc.**





Biomedical and Photonics research platform for innovative products “BioPhoT”



LATVIJAS
UNIVERSITĀTE

SUMMARY: Biomedical and Photonics research platform “BioPhoT” is a long-term national research programme that brings together eight leading Latvian research organisations to accelerate high-impact innovation. It advances biomedicine, pharmaceuticals, medical technologies, photonics, engineering, and smart materials, transforming scientific discoveries into market-ready solutions. By 2032, BioPhoT will support nearly 200 research and innovation projects.

AREA OF ACTION: Biomedicine and Photonics.

OBJECTIVES	DESCRIPTION
The “BioPhoT” platform strengthens academic and applied research capacity to develop commercialisable technologies in biomedicine and photonics. By 2032, it aims to deliver 35 technologies at TRL 3–4, with at least 23 advancing to TRL 5–6 and four reaching commercialisation. The platform places strong emphasis on innovation, education, and technology transfer, fostering collaboration and dialogue among researchers, industry, and policy-makers.	“BioPhoT” platform is Latvia’s national research platform for biomedicine and photonics, dedicated to developing innovative products and technologies. Through 2032, the platform will implement research and innovation projects in biomedicine, pharmaceuticals, medical technologies, photonics, engineering, and smart materials. The platform consortium is coordinated by the National Institute of Research and Innovation. Consortium partners include the Institute of Electronics and Computer Science, the Scientific Institute for Food Safety, Animal Health and the Environment (BIOR), the University of Latvia, the Institute of Solid-State Physics, University of Latvia, the Latvian State Institute of Wood Chemistry, Riga Stradiņš University, and Riga Technical University. Aligned with Latvia’s smart specialisation priorities, the platform strengthens collaboration between academia and industry while accelerating the development of market-ready solutions.

RESULTS	REPRODUCIBILITY
By 2032, the platform will deliver 35 technologies at TRL 3–4, with at least 23 advancing to TRL 5–6 and at least four reaching commercialisation. The platform will support a total of 195 projects, backed by €13.2 million by 2026 and €27 million by 2032, ensuring measurable innovation and market-oriented outcomes.	Reproducibility is ensured through a structured, TRL-driven pipeline, shared methodologies, and coordinated governance across eight partner institutions. Standardised validation procedures, peer review mechanisms, and harmonised data management support consistent results across the biomedicine and photonics domains. Shared infrastructure enables the replication of experiments and benchmarking of technologies. Continuous collaboration between academia and industry strengthens validation under real-world conditions. Training, innovation transfer practices, and cross-institutional project alignment further ensure methodological consistency, enabling the repeatable development of technologies from early-stage research through prototyping and pre-commercialisation across the consortium.



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Impact Exploration: Transforming Research into Action



SUMMARY: This workshop guides researchers through a practical process to define, measure, and communicate the impact of their work. By applying the Heilmeier Catechism as a reflection tool and exploring a deck of over 100 potential user groups, facilitators can help participants identify real-world needs and align their research objectives accordingly.

AREA OF ACTION: Research Impact, Stakeholder (user) Engagement, and Proposal Development.

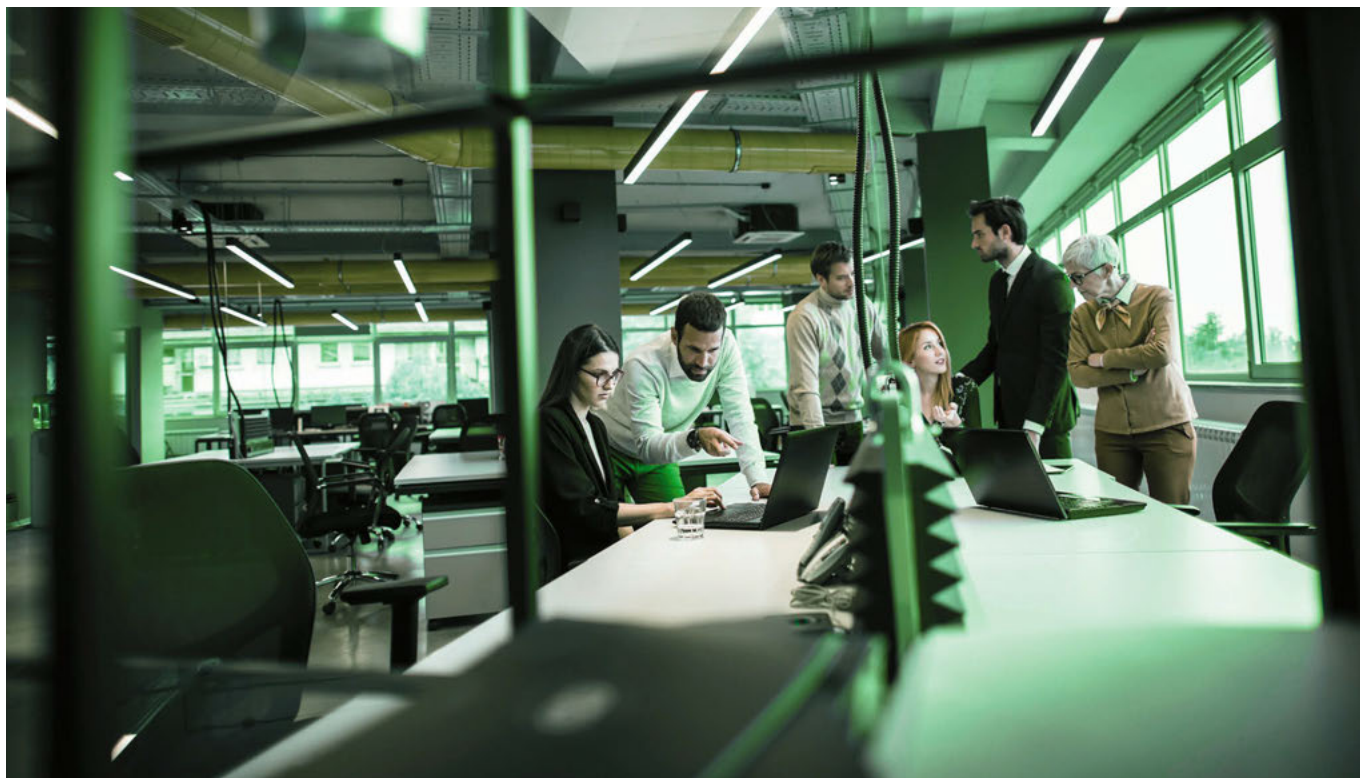
OBJECTIVES	DESCRIPTION
The “Impact Exploration” workshop is designed to highlight how academic and applied research can catalyze both social and economic transformations. Participants are introduced to the concept of research impact early in the session, illustrating its significance for proposal writing and funding. The workshop then employs George Heilmeier’s Catechism to encourage participants to express their research aims in a concise, jargon-free manner. Facilitators also use a deck of 100+ stakeholder cards to help participants explore and map a diverse range of end-users, beneficiaries, or collaborators. Identifying these user groups is critical for understanding the challenges they face and for demonstrating how research can offer tangible solutions.	This workshop typically spans two hours, though times can be adjusted based on participant numbers and the depth of discussion desired. No prerequisites are required, making it suitable for researchers across multiple fields and career stages. It often begins with a short introductory segment where the facilitator sets the stage by defining “impact” and explaining why it is vital in the context of proposal writing, funding, and collaboration with partners. Following the introduction, participants work through several structured activities: 1. Heilmeier Catechism Reflection Rather than using slides or long lectures, facilitators prompt participants to respond to each question in the Heilmeier Catechism. This step emphasizes clarity of expression. For reference, George Heilmeier’s original questions can be found on the DARPA website . At its core, this exercise seeks to strip away field-specific jargon, pushing researchers to articulate their aims, methods, novelty, and expected outcomes in everyday language.

OBJECTIVES	DESCRIPTION
At the end of the workshop, participants will have a clearer sense of their research's potential reach and a replicable template to further refine their impact strategies. Key Objectives Include: • Helping researchers articulate and refine their research goals, using the Heilmeier Catechism as a foundational framework. • Demonstrating the importance of stakeholder mapping, through a deck of over 100 potential user groups, to reveal how research can address real-world needs. • Ensuring workshop organizers have a repeatable process that can be adapted to various disciplines, levels of expertise, and organizational settings.	2. Stakeholder Identification After clarifying their research objectives, participants are presented with a deck of over 100 stakeholder or user cards. Each card represents a potential individual, organization, community, or field that might benefit from or be affected by the participant's research. By spreading these cards out on a table or by digitally sharing them, researchers see the breadth of possible users. The facilitator encourages them to pick multiple cards (or categories) that seem relevant. Discussion focuses on the unique challenges each group faces. 3. Problem-Solution Mapping Once participants identify the stakeholder groups most relevant to their research, they outline the core problems or pain points these groups experience. In parallel, they reflect on how their research could address such issues. This helps participants visualize potential pathways for impact beyond academia and fosters a user-centric mindset. 4. Group Discussion and Next Steps The workshop concludes with an open forum where researchers share insights on how they might further develop or modify their work to better serve identified user groups. Facilitators also encourage participants to incorporate these reflections into funding applications or in communication with non-academic partners.

CONTACT / WEBSITE

GUTENBERG innovate: <https://innovate.uni-mainz.de/>
Mainz Science Alliance: <https://www.wissenschaftsallianz-mainz.de/>

RESULTS	REPRODUCIBILITY
Results and implementation tips: 1. Provide Examples of Impact Real-life case studies (drawn from participants’ own institution or external sources) can illustrate how other researchers have framed impact and aligned their work with user needs. 2. Encourage Peer Feedback Peer-review sessions for Heilmeier Catechism drafts help participants refine their statements and discover common stakeholder interests or overlapping areas of impact. 3. Create an Inclusive Environment By reassuring participants that no prior knowledge is necessary, facilitators can foster collaboration across disciplines and experience levels. 4. Use the Stakeholder Deck Strategically Instead of forcing every participant to sift through all 100+ cards, consider dividing them into categories or allowing researchers to scan them briefly and select the ones most relevant to their interests. Group discussions of these selections often spark creative ideas or unexpected collaborations. 5. Capture Outputs Encourage participants to document their main findings—particularly which stakeholder groups resonate and what solutions could be developed in response to those groups’ challenges. This output can then be integrated into ongoing research planning or funding proposals.	The structure of this workshop is highly adaptable. Facilitators can: • Shorten or extend each section based on participant needs or schedule constraints. • Modify the Stakeholder Cards to reflect unique local or disciplinary contexts (e.g., swapping out cards or adding new ones for particularly niche fields). • Incorporate Additional Reflection Tools if desired, such as a simplified logic model or theory of change. Because the Heilmeier Catechism and stakeholder mapping are both straightforward and flexible, other institutions can replicate the workshop with minimal logistical requirements, using a simple set of printed or digital resources.



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Boosting Research-Based Solutions for SMEs at Johannes Gutenberg University Mainz (JGU)



JOHANNES GUTENBERG
UNIVERSITÄT MAINZ

SUMMARY: Johannes Gutenberg University Mainz supports the implementation of research-based solutions in regional small and medium enterprises through its structured technology transfer activities and strong partner networks. By guiding researchers from invention disclosure and protection to licensing, collaborative projects, and industry partnerships, JGU enables the practical application of scientific knowledge and strengthens regional innovation ecosystems.

AREA OF ACTION: research-based innovation; university-SME cooperation; intellectual property management; regional innovation networks.

OBJECTIVES	DESCRIPTION
The initiative aims to translate academic research into market-ready solutions for SMEs by combining professional technology transfer services with strong regional and industrial partnerships. It seeks to reduce barriers for SME cooperation, protect intellectual property, foster co-innovation, and connect researchers with companies, public institutions, and innovation hubs to generate sustainable economic and societal impact.	At JGU, the technology transfer office accompanies researchers throughout the entire innovation lifecycle, from invention disclosure and evaluation of commercial potential to intellectual property protection, licensing, and cooperative R&D projects with SMEs. The university actively connects researchers with industrial partners such as BASF, Boehringer Ingelheim, Merck, and Schott, as well as regional SMEs. JGU is a core partner in the Mainz Science Alliance , fostering collaboration among universities, research institutes, businesses, and cultural organisations. In addition, the JGU Startup Center , together with partners such as the Ministry of Economic Affairs Rhineland-Palatinate, the Chamber of Industry and Commerce Rhineland-Palatinate, the Life Science Center Mainz (formerly the Technology Center Mainz), and the Gutenberg Digital Hub, provides entrepreneurial support, networking opportunities, and access to innovation infrastructure. Since 2026, JGU's technology transfer office and startup center have been integrated into GUTENBERG Innovate as a central point of contact.

RESULTS	REPRODUCIBILITY
The integrated approach increases the transfer of academic innovations into SMEs, enabling new products, processes, and services. Researchers benefit from professional support and partner access, while SMEs gain tailored research-based solutions. Collaboration within the Mainz Science Alliance and startup networks strengthens regional innovation capacity and contributes to sustainable economic development.	This model is transferable to universities seeking to boost SME-oriented innovation through research transfer. Key elements include a dedicated technology transfer office, clear procedures for invention disclosure and IP protection, and proactive partner matchmaking. Embedding these services in regional alliances (e.g., science alliances), startup centres, and innovation hubs, and cooperating with public agencies and chambers of commerce, enhances reach and effectiveness. Strong institutional commitment and active network management are essential to replicate this approach and create resilient research-industry ecosystems.



CONTACT / WEBSITE

GUTENBERG innovate: <https://innovate.uni-mainz.de/>
Mainz Science Alliance: <https://www.wissenschaftsallianz-mainz.de/>



Sibiu Innovation Days 2025: EMERGING TECHNOLOGIES: Balancing Innovation, Risks, and Societal Impact



UNIVERSITATEA
LUCIAN BLAGA
— DIN SIBIU —

SUMMARY: Sibiu Innovation Days is a key event to promote innovation, digital transformation, and collaboration among academia, industry, public administration, students, and citizens. Hosted by HPI-ULBS at Lucian Blaga University of Sibiu, the event supports regional development in southern Transylvania through applied research, prototyping, knowledge transfer, and co-creation. It also highlights Romania's need to strengthen innovation networks and learn from more advanced European innovation ecosystems.

AREA OF ACTION: innovation, digitalization, collaborative networks.

OBJECTIVES	DESCRIPTION
The main objectives of Sibiu Innovation Days 2025 are: To present, disseminate, and promote scientific research and technological development results through lectures, debates, panels, workshops, and student innovation projects. To increase knowledge of international developments in emerging technologies, including blockchain, generative artificial intelligence, quantum computing, cybersecurity, sustainable technologies, and green digital transition. To connect the Romanian scientific community with international research and innovation networks, increasing the visibility and recognition of Romanian research at the European and global level. To strengthen Romania's participation in European research and innovation programs, including Horizon Europe, Erasmus+, EEA Grants, and other collaborative funding opportunities.	Sibiu Innovation Days 2025, now in its sixth edition, will take place on November 6–7, 2025, and will be organized by Lucian Blaga University of Sibiu through the Hasso Plattner Knowledge Transfer Institute, with the support of Cluj IT Cluster and Sibiu IT Cluster. The event is part of Sibiu Innovation Week 2025, dedicated to the theme “Innovation. Collaboration. Transformation.” The event brings together international experts, researchers, public authorities, entrepreneurs, industry leaders, academics, students, and civil society representatives to explore how emerging technologies can support digital transformation, sustainable development, knowledge transfer, and regional innovation.

OBJECTIVES	DESCRIPTION
5. To foster innovation and knowledge transfer between academia, industry, public administration, and civil society, supporting partnerships, applied research, prototyping, intellectual property development, and startup growth. 6. To raise awareness in society about the importance of scientific research and technological development, especially in relation to the opportunities, risks, ethical challenges, and societal impact of emerging technologies. 7. To support education transformation and skills development, focusing on upskilling, reskilling, lifelong learning, and preparing students and employees for the jobs of the future. 8. To encourage student creativity and practical innovation through a dedicated hackathon and project session focused on digital transformation, artificial intelligence, cybersecurity, quantum technologies, and sustainable development.	Sibiu Innovation Days 2025 focuses on key technological and societal challenges, including blockchain and cybersecurity, quantum computing, artificial intelligence, green digital transition, education transformation, and innovative partnerships. The event promotes collaboration between academia, industry, public administration, and society, following the Quadruple Helix innovation model. The program will include keynote speeches, scientific lectures, thematic panels, debates, industrial workshops, and a student hackathon dedicated to digital and sustainable transformation. Through these activities, the event aims to strengthen the regional innovation ecosystem, increase Romania's visibility in European research and innovation networks, and reduce the innovation gap between Romania and more advanced European countries.

RESULTS	REPRODUCIBILITY
Sibiu Innovation Days 2025 is more than a conference: it is a strategic innovation accelerator for Romania, enabling collaboration across academia, industry, policy, and society to transform the country from an emerging innovator into a proactive participant in Europe's digital and green future. Sibiu Innovation Days 2025 strengthens Romania's position in the European innovation ecosystem by fostering collaboration between quadruple helix stakeholders (academia, industry, governance structures, and society) around emerging technologies such as generative AI, quantum computing, blockchain, and green digital transition.	The event enhances Romania's international visibility, enabling new research collaborations, EU project applications, and academic mobility opportunities. It also empowers students and entrepreneurs through hackathons and industrial workshops, while raising public awareness of the societal, ethical, and economic impact of digital transformation. Overall, SID2025 acts as a catalyst for regional growth and a mindset shift toward innovation in a country striving to close its gap with Europe's innovation leaders.



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SPARK Joint Laboratory



SUMMARY: The lab brings together UBE’s ICB laboratory, the local SME SINTERMAT, and aerospace and defense industry heavy-player SAFRAN to research innovative materials.

AREA OF ACTION: R&D, industry co-creation.

OBJECTIVES	DESCRIPTION
The SPARK joint laboratory enables research on innovative materials with direct applications in strategic industries such as the aerospace and defense industry, for which SAFRAN is continually seeking improved materials to enhance its technology.	The SPARK (S intering P ulsed to A dvanced mate R ials and K nowledge) joint laboratory researches Spark Plasma Sintering (SPS). This “flash sintering” technique that uses heat and electrical pulses to fuse powders into a dense solid material has been at the heart of leading research at UBE’s ICB lab for over 20 years. SME SINTERMAT, founded by an ICB PhD graduate, builds on this research and its in-house R&D to produce materials tailored to a variety of industries.

RESULTS	REPRODUCIBILITY
The research conducted at the SPARK Joint Laboratory serves a strategic purpose for French technology giants and SMEs alike, as the demand for innovation in the defense industry is booming.	Public research and industry co-creation significantly accelerate innovation transfer and are a time-proven collaboration model.

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<https://icb.cnrs.fr/en/inauguration-of-the-spark-joint-laboratory-at-the-icb-laboratory-a-groundbreaking-collaboration-for-innovation-in-sps-sintering/>



Pôle Universitaire d'Innovation



SUMMARY: The Pôle Universitaire d'Innovation aims to foster innovation and technology transfer at Université Bourgogne Europe by identifying promising research projects and bridging the gap between researchers and local stakeholders.

AREA OF ACTION: innovation; technology transfer.

OBJECTIVES	DESCRIPTION
Boost the efficiency of existing innovation support initiatives and bridge the gap between research labs and economic stakeholders.	Université Bourgogne Europe co-founded Bourgogne Franche-Comté's Pôle Universitaire d'Innovation in 2024 alongside several public research institutions from the region. This unit promotes public research and entrepreneurial innovation with a strong focus on deep tech start-ups creation. Experts from the Pôle Universitaire d'Innovation foster innovation in the three key areas for which the Bourgogne Franche-Comté Region has earned a strong reputation: • Health, biotherapies, and digital diagnostics. • Agri-food transition. • Carbon-free hydrogen and sustainable mobility. These experts raise awareness of technology transfer among the research community and coordinate exchanges with economic stakeholders to best meet their needs for innovation. They also conduct in-depth monitoring of regional public research institutions to identify research projects that have high commercialization potential. This service helps reduce review times to reach the transfer phase more quickly, with the well-established technology transfer companies and business incubators taking over when it is reached.

RESULTS	REPRODUCIBILITY
The Pôle Universitaire d'Innovation fills an important gap in technology transfer by helping identify research results that are worth patenting and could therefore result in the creation of start-ups or cooperation with local and regional SMEs. This expertise provides a necessary boost to innovation for research labs and researchers who do not initially have a technology-transfer-oriented mindset when conducting their research. Communication between academic and economic stakeholders is streamlined to foster collaboration.	The Pôle Universitaire d'Innovation, as a joint unit benefiting all stakeholders from a set region, is a highly transferable model that can be adapted to smaller or larger areas. Its co-creative approach provides flexibility to best meet local needs. Thematic areas of interest can be redefined to reflect the region's strongholds.



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Engage4BIO



**Università
degli Studi
di Palermo**



SUMMARY: Engage4BIO is an educational and community-oriented initiative aimed at promoting awareness, knowledge, and active engagement in the field of circular, sustainable bioeconomy and sustainable regional development. The project focuses on bridging the gap between scientific research and society through inclusive, participatory, and co-creative approaches.

AREA OF ACTION: Co-creation; Regional Development, Education, Sustainability, Community Engagement, Awareness campaigns.

OBJECTIVES

- To increase public awareness and understanding of bio-based innovation.
- To foster dialogue between researchers, students, enterprises, policy makers, and the wider community.
- To encourage sustainable practices and responsible innovation.
- To promote interdisciplinary learning and collaboration.
- To promote co-creation processes involving students, researchers, enterprises, and citizens in the development of bio-based solutions.
- To support regional governance and policymaking through stakeholder engagement and feedback loops.
- To contribute to ecological transition and smart specialisation strategies in the region.

DESCRIPTION

The initiative is part of the Italian Hub of the Engage4BIO project, coordinated by the University of Palermo (UNIPA) and implemented in collaboration with regional stakeholders, including researchers, secondary schools, local authorities, and blue economy clusters.

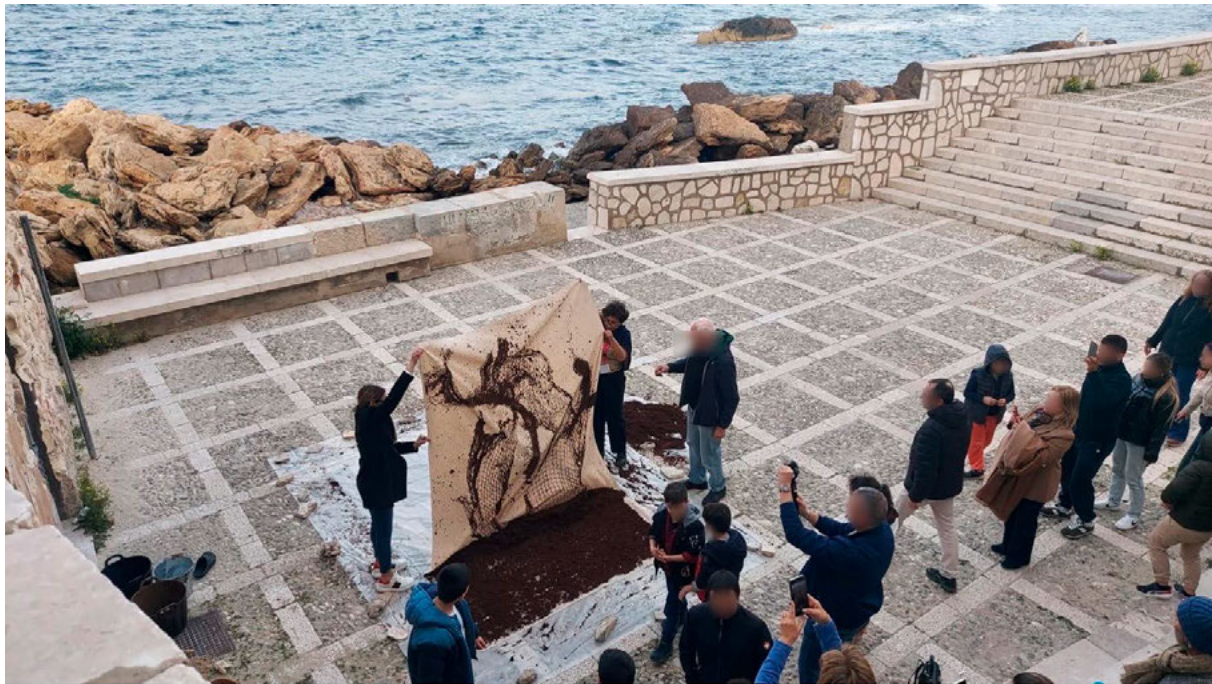
The Italian Hub, located in Trapani and led by Prof. Concetta Maria Messina, combines education, outreach, and participatory activities to make marine biotechnology more accessible and engaging. The project includes workshops, seminars, interactive labs, and public awareness events designed to involve students, educators, enterprises, and citizens.

The project strongly adopts a co-creation approach involving multiple stakeholders (enterprises, researchers, citizens, and public authorities). The quadruple helix approach helps to identify skills needs and jointly design training activities, whilst citizens and local communities are actively engaged through awareness-raising campaigns and participatory initiatives. Marginalised groups are involved in upskilling programmes, thereby ensuring inclusivity and social impact.

Through hands-on experiences and collaborative learning, participants gain a deeper understanding of marine bio-based solutions and their role in addressing environmental and societal challenges. The initiative emphasises inclusivity, innovation, and the practical application of scientific knowledge.

Activities are developed through co-creation processes, where participants actively contribute to the design and implementation of learning experiences. These include training workshops, mentoring programmes, lifelong learning, awareness campaigns, and participation in international events such as the Blue Sea Land Expo. There will also be access to research labs and pilot facilities through the establishment of a Living Lab and a Community of Practice for technology transfer.

RESULTS	REPRODUCIBILITY
• Promotion of innovative governance models through the establishment of a Living Lab, the development of a Community of Practice, and the co-creation of a Roadmap to strengthen local engagement, enhance governance, and drive innovation across fisheries and marine value chains. • Implementation of awareness-raising events and communication campaigns to promote the sustainable and responsible consumption of local marine resources in line with their seasonal availability, as well as the promotion and rediscovery of traditional recipes. • Realization of training programmes for secondary school teachers and students to support the integration of blue bioeconomy topics into educational pathways, contribute to the development of new professional curricula, and strengthen connections among stakeholders across maritime and coastal communities within the blue value chain.	The Engage4BIO model is highly transferable and can be adapted to different educational and regional contexts. Its modular structure, combining workshops, outreach, and interactive learning, allows institutions and organisations to replicate the approach using available resources and local expertise. The model is also transferable across European regions, as it is based on adaptable co-creation processes that account for local resources, cultural contexts, and stakeholder ecosystems.



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EmpowerHer – Entrepreneurial Training and Research Valorisation for Women



Università
degli Studi
di Palermo

SUMMARY: EmpowerHer is an advanced training initiative developed at the University of Palermo, designed to support women researchers in acquiring the entrepreneurial competencies needed to valorise their scientific results. The program combines a two-day intensive training course with a public Roadshow, addressing the full spectrum of research valorisation – from intellectual property and spin-off creation to business model design and pitch development – with a specific focus on female entrepreneurship and innovation.

AREA OF ACTION: Technology Transfer and Entrepreneurship.

OBJECTIVES	DESCRIPTION
EmpowerHer aims to equip women researchers, doctoral candidates, and research fellows with the foundational knowledge and practical tools needed to transform research outcomes into entrepreneurial initiatives. By fostering an entrepreneurial mindset and providing hands-on experience in business model development and pitching, the program seeks to reduce the gender gap in academic entrepreneurship and to promote the active participation of women researchers in technology transfer and innovation processes.	EmpowerHer is structured as an integrated initiative combining a training course and a public Roadshow. The training component was delivered at the University of Palermo through lectures and hands-on workshops coordinated by the University of Palermo and enriched by the contributions of academic faculty from other Italian universities and industry professionals. Sessions covered key topics including entrepreneurship and gender, intellectual property rights, spin-off and start-up creation, legal and financial aspects of new venture creation, business model canvas, business plan development, and pitch construction. The course ended with group pitching sessions in which participants presented the entrepreneurial ideas developed during the program. The event featured keynote speeches, a panel discussion on the opportunities and challenges of female entrepreneurship, and contributions from entrepreneurs, spin-off founders, and innovation ecosystem representatives. The initiative brought together 30 women researchers from across all university departments, reflecting the broad multidisciplinary reach of the program.

RESULTS

EmpowerHer successfully engaged 30 women researchers from all university departments in an integrated training and networking experience. A working group formed during the initiative subsequently participated in the EIT Food Innovator Fellowship Program in Porto – a European initiative dedicated to agri-food innovation and research valorisation – where the team Fenolea, “Transforming Olive Oil By-products into Sustainable Solutions”, was awarded, representing a concrete and recognised outcome of the entrepreneurial path initiated through EmpowerHer.

REPRODUCIBILITY

EmpowerHer is designed as a recurring initiative, with a second edition already planned for 2026. Its format – combining structured training, peer learning, and public networking – can be replicated in other university contexts and across different national settings, making it a transferable model for any institution seeking to promote female entrepreneurship and research valorisation. The program addresses a challenge that transcends national boundaries: the underrepresentation of women in academic entrepreneurship and technology transfer. For this reason, EmpowerHer represents a reference model that universities and research institutions across Europe and beyond can adopt and adapt to their own context, contributing to a broader cultural shift towards inclusive innovation ecosystems.



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Biodiversity Gateway

Venture Building Program



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SUMMARY: The Venture Building (VB) program was developed at the University of Palermo within the framework of the National Biodiversity Future Center (NBFC) Biodiversity Gateway. The program supports research teams in transforming scientific results in the Biodiversity field into structured entrepreneurial initiatives. The program was structured in a two-phase pathway combining rigorous project selection and intensive acceleration, culminating in direct exposure to investors and the innovation ecosystem.

AREA OF ACTION: Technology Transfer.

OBJECTIVES	DESCRIPTION
The VB aims to bridge the gap between academic research and the market by guiding multidisciplinary research teams through the full venture-building process. By combining scouting, competitive selection, thematic workshops, and personalised coaching, the initiative seeks to develop entrepreneurial competencies among researchers, strengthen the technology transfer capacity of the university, and generate new research-driven ventures with concrete market potential and sustainability prospects.	The VB program is structured in two sequential phases. The first phase – the launch phase – involved active and passive scouting across university departments, analysis of patents and spin-offs, and a public call that generated over 120 interactions and attracted 24 project proposals from diverse scientific fields including biotechnology, agri-food innovation, marine bioeconomy, environmental monitoring, and digital technologies. Following a multicriteria evaluation process and a structured Selection Day, eight projects were admitted to the acceleration phase. The second phase – the acceleration phase – was delivered over ten training days across five thematic workshops held at the Technology Transfer Centre of the University of Palermo. The methodological framework was progressively structured to guide teams through the key dimensions of venture building: problem-solution fit, market analysis, business model design, governance and organisational structure, and financial modelling. Sessions were led by a combination of internal university faculty and external industry professionals, ensuring both academic rigour and practical market orientation. Each team also benefited from weekly one-to-one coaching sessions with NBFC researchers, pitch clinic sessions, and structured peer review moments. The program ended with an Investor Day held on 15 January, where all eight teams presented their ventures to a qualified audience of investors, institutional stakeholders, and potential industrial partners.



RESULTS	REPRODUCIBILITY
All eight selected teams completed the full acceleration pathway, with full team-level participation recorded across all workshops and coaching sessions. The Investor Day was successfully held on 15 January, providing teams with formal exposure to investors, institutional stakeholders, and potential industrial partners. Following the VB, four out of eight projects advanced to the company incorporation phase and are currently in negotiation with investors for a first funding round. Beyond the entrepreneurial outcomes, the VB generated a measurable cultural shift among participants. Survey data collected at the end of the program showed that 100% of respondents would recommend a similar experience to a colleague. Notably, 75% of participants had never previously had any contact with the university's Technology Transfer Office, indicating that the program successfully reached researchers who were entirely outside the existing technology transfer ecosystem – broadening the university's innovation perimeter in a significant and concrete way.	The Biodiversity Gateway Venture Building Program is designed to be replicable in other university contexts and research gateway settings. Its methodology – combining structured scouting, competitive selection, modular acceleration, and investor-facing events – can be adapted to different institutional frameworks and disciplinary ecosystems. The program's design is grounded in the consolidated expertise developed by the University of Palermo and the Biodiversity Gateway in managing the full venture-building cycle, from the identification of research-based ideas to their translation into investable ventures. This accumulated know-how – spanning scouting methodologies, multicriteria evaluation frameworks, acceleration design, and investor engagement – represents a transferable asset that other universities and research centres can draw upon. The VB program can be reproduced by adapting its modular structure to the specific scientific profile and institutional context of the adopting organisation, maintaining the core methodological architecture developed and tested at the University of Palermo.

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SUMMARY: BlueRev is a project aimed at revitalising local communities across Europe by promoting innovative bio-based businesses, governance models, and social innovations within the blue bioeconomy sector. The initiative adopts a co-creation approach to foster collaboration among stakeholders through programmes that bring together primary biomass producers and civil society actors, including NGOs and SMEs, while supporting their integration into bio-based value chains.

AREA OF ACTION: Co-creation; Sustainability; Ecological Transition; Technological Innovation, Blue Economy, Blue bio-based value chains.

OBJECTIVES	DESCRIPTION
• To promote sustainable practices and the transition towards a resilient local blue bioeconomy, including the integration of marine by-products into circular production processes. • To support project pilot regions (Denmark, Italy, and Estonia) in testing and validating scalable and replicable models. • To strengthen collaboration among research, industry, and local communities through co-creation processes. • To develop and implement innovative, sustainable, and resilient governance models for designing effective blue solutions.	The BlueRev project is part of a broader set of initiatives aimed at enhancing marine resources and promoting sustainability, shifting the focus from resource exploitation towards resilience and responsible management. Through research, training activities, and active stakeholder engagement, the project develops innovative and replicable models for sustainable resource management. It aims to revitalise local communities across Europe by supporting the creation of innovative bio-based businesses, governance models, and social innovations within the blue bioeconomy sector, while demonstrating the benefits of a widespread transition towards a sustainable bio-based economy. BlueRev actively involves a wide range of stakeholders, including researchers, enterprises, public authorities, and civil society, in the co-design and co-development of marine bio-based solutions. Participatory processes such as workshops, co-creation activities, collaborative labs, and stakeholder dialogues enable the identification of local needs, the joint development of strategies, and the validation of innovative practices.

OBJECTIVES	DESCRIPTION
• To foster innovation by promoting novel business and social enterprise models within the blue bioeconomy sector, while raising awareness of its potential • To enhance skilled employment opportunities by delivering targeted training programmes and practical guidelines for small and medium-sized enterprises (SMEs).	The project further promotes inclusiveness by actively engaging marginalised groups and fostering their participation in training programmes and innovation processes, thereby strengthening social cohesion and advancing equitable development.

RESULTS	REPRODUCIBILITY
• Dissemination of research results at local and international levels. • Strengthening of professional skills in the blue bioeconomy sector. • Consolidation of collaborations among universities, businesses, and local stakeholders. • Promotion of replicable and sustainable models for the valorisation of marine resources. • Delivery of training courses and webinars for researchers, students, and local enterprises. • Enhanced transfer of scientific knowledge to real-world applications, linking laboratory activities with the needs of productive sectors and coastal communities.	The BlueRev model is highly transferable and can be adapted to other coastal regions and contexts interested in ecological transition and sustainable marine resource management. Its approach is co-creative, focusing on innovative bio-based businesses, governance models, and social innovations. This multi-actor, participatory framework facilitates replication across diverse socio-economic and environmental contexts. By integrating local stakeholders, including national, regional, and local authorities, clusters, primary producers, SMEs, cooperatives, NGOs, researchers, and civil society, the co-creation approach ensures adaptability and responsiveness to local needs.



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Simona Manuguerra, Post-doc fellow at the Department of Earth and Marine Sciences, UNIPA

THEMATIC AREA 2:

**Training researchers in technology
and knowledge transfer: curricula,
micro-credentials, summer schools,
industrial PhDs, TTO/KTO roles,
mentoring, and impact assessment**



Partaking in training Early Career Researchers in Technology and Knowledge Transfer: the Gutenberg Academy (GA)



JOHANNES GUTENBERG
UNIVERSITÄT MAINZ

SUMMARY: The Gutenberg Academy is a central institution at JGU that supports researchers in the early stages of their careers and consolidates various funding, training, and networking opportunities in one place. Complementing general offers, it also provides discipline-specific support and offers through the *Gutenberg Graduate School of the Humanities and Social Sciences (GSHS)* and *Network NatLife*.

AREA OF ACTION: Training Early-Stage Researchers in Knowledge and Technology Transfer, Networking, Qualification programmes in the field of knowledge transfer, Science Communication, and interdisciplinarity.

OBJECTIVES	DESCRIPTION
The Gutenberg Academy offers workshops, consultations, and networking opportunities that promote the ability to communicate scientific content, work in an interdisciplinary manner, and place one’s own research in socially relevant contexts – important foundations for science communication.	Gutenberg Academy provides information, organizes workshops and science slams, and exchange and networking formats that help early-stage researchers to make their expertise visible – even outside the university. With formats like the Entrepreneurship Workshop Series, it introduces practical tools such as Business Model Canvas or pitching training, and thereby promotes the ability to communicate scientific content, to work in an interdisciplinary manner, and to place one’s own research in socially relevant contexts. This creates an important foundation for training ECRs in science communication while emphasizing the relevance and impact of technology transfer. Additionally, skills assessment workshops using the ERA tool ResearchComp help understand the importance of transfer skills for researchers within and outside academia.

RESULTS	REPRODUCIBILITY
The newly installed Academy is not a traditional science communication institution in the specific sense, but rather a structural career and qualification platform that also strengthens skills for transfer and outreach. Complementary offers at JGU include research data management, scientific writing, open access, and good scientific practice workshops, ensuring a holistic and interdisciplinary approach to knowledge and technology transfer.	The Mainz model is adaptable to universities aiming to centralise early-career researcher support. Key transferable elements include a central academy structure, interdisciplinary workshop formats, entrepreneurship training, and clear communication channels such as newsletters and networking events. Institutions with access to mentors, technology transfer offices, and disciplinary graduate schools can replicate the structure with moderate resource requirements, ensuring sustainable re-searcher development. This model offers a flexible framework concept for the European higher education landscape. It is suitable for universities that want to strengthen their support and visible structures for early career researchers and systematically develop transfer and communication skills.



CONTACT / WEBSITE

Gutenberg Academy: <https://ga.uni-mainz.de/>

Lifelong Learning Programme for Researchers in the framework of the European Charter and Code for Researchers



**Università
degli Studi
di Palermo**



SUMMARY: The University of Palermo (UNIPA) was among the first 40 European institutions to participate from the outset in the “HRS4R: Human Resources Strategy for Researchers” initiative. In March 2010, UNIPA was awarded the HR Excellence in Research logo in recognition of the significant progress made in implementing the principles of the European Charter for Researchers and the Code of Conduct for their Recruitment. The HRS4R process is currently in its third renewal phase. As part of this ongoing commitment, UNIPA has set an ambitious goal to establish a Continuous Learning Programme for both junior and senior researchers and professors.

AREA OF ACTION: Human Capital.

OBJECTIVES

- Develop skills and competencies that extend beyond disciplinary boundaries and career stage.
- Foster a supportive and inclusive research community and a shared commitment to excellence.
- Promote a culture of responsible research and integrity.

DESCRIPTION

In 2023 the University of Palermo has been awarded the renewal of the prestigious HR Excellence in Research certificate by the European Commission for the progress made in implementing the principles of the European Charter for Researchers on the four pillars, (I) Ethics, Integrity, Gender and Open Science; (II) Researchers' Assessment, Recruitment and Progression; (III) Working Conditions and Practices; (IV) Research Careers and Talent Development.

The implementation of the Action Plan is pursued by the synergic action of the HRS4R Steering Committee, coordinated by the Rector's Delegate for the HRS4R process, and by a Charter and Code Working Group led by the Head of the Human Resources Area. Among the recent initiatives, UNIPA has revised its Ethical Code to incorporate several key principles related to Research Ethics.

Another key initiative focuses on the development of a Continuous Learning Programme designed to support and enhance research careers. The programme includes workshops and seminars with the following aims:

To foster the development of essential research skills, including advanced methodologies, data management, grant writing, and the valorisation of research outputs.

To provide training in leadership, project management, internationalisation, and academic entrepreneurship.

RESULTS

By focusing on the development of skills and competencies that transcend disciplinary boundaries and career stages, the Continuous Learning Programme empowers both junior and senior researchers to adapt to evolving scientific challenges and societal needs. This approach not only enhances individual research capacity but also promotes innovation and interdisciplinary collaboration, strengthens cohesion within the academic community, encouraging knowledge exchange, peer support, and a shared commitment to excellence. It fosters the development of a dynamic, ethical, and inclusive research culture, dedicated to the continuous development and recognition of its researchers.

CONTACT / WEBSITE

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INSPIRE - Integrated Skills for Promoting Innovative Research and Entrepreneurship



Università
degli Studi
di Palermo

SUMMARY: INSPIRE is a training program developed at the University of Palermo targeting doctoral candidates, early-stage researchers, and research fellows. It aims to bridge the gap between academic research and entrepreneurship by providing participants with the transversal competencies needed to valorise scientific results into concrete business opportunities. The program covers the full technology transfer pathway – from intellectual property protection to business model design – combining theoretical sessions with interactive workshops.

AREA OF ACTION: Technology Transfer.

OBJECTIVES	DESCRIPTION
The objective of this best practice is to equip doctoral candidates and research fellows with the foundational knowledge needed to understand the different pathways for valorising scientific research. By combining entrepreneurial mindset development with hands-on exploration of key technology transfer topics – including intellectual property protection, spin-off and start-up creation, Deep Tech and Artificial Intelligence – the program aims to bridge the gap between academic research and its concrete application to the economic system, fostering a new generation of research-driven entrepreneurs.	INSPIRE is structured as a 25-hour program delivered over five days, combining lectures and hands-on workshops. Sessions are led by academic faculty and industry experts, covering key topics in research valorisation including intellectual property protection, spin-off and start-up creation, and the application of Deep Tech and Artificial Intelligence to research-based entrepreneurship. The program was developed with the support of BIREX, the Competence Centre specialised in Big Data for the digitalisation of business processes, and in collaboration with the University’s Doctoral School, which co-promoted the initiative as part of its commitment to broadening the training offer for doctoral candidates and research fellows. The first call attracted over 130 registrations, with the first edition launched with 20 participants drawn from different university departments, reflecting the multi-disciplinary nature of the initiative. Given the strong interest received, a second edition is already in planning. Participants who complete the program are awarded a certificate of attendance.

RESULTS

The first edition of INSPIRE was completed with 20 participants selected from a pool of over 130 registrations, reflecting strong demand across university departments. All participants who completed the program were awarded a certificate of attendance. The high number of applicants confirmed the relevance of the initiative and prompted the planning of a second edition, already scheduled with a new cohort of 20 participants. Feedback collected from participants was consistently positive, with doctoral candidates highlighting a significant increase in awareness of the valorisation potential of their own research results.

REPRODUCIBILITY

INSPIRE was designed as a replicable model for universities seeking to develop technology transfer culture among their research community. The first edition served as a pilot to establish the organizational cycle — from participant selection and curriculum delivery to certification. The format can be exported to other institutions as a structured approach to research valorisation training, and can equally be extended internally to broader academic communities, including structured researchers and faculty members, progressively building entrepreneurial awareness across all levels of the academic career.



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DATA UBFC



SUMMARY: DATA UBFC provides training on data management within research projects and units and encourages open science practices among researchers.

AREA OF ACTION: Knowledge transfer; open data; open science.

OBJECTIVES	DESCRIPTION
Provide training on open science to researchers and administrative staff.	Data UBFC was co-founded by Université Bourgogne Europe in 2022 as part of a national open science call from the French Ministry of Research and Higher Education. Researchers and administrative staff are provided with a wide range of training on data management within research units, archiving, and open science. They can also receive training on how to prepare a detailed data management plan tailored to the national and EU call applications' requirements. Tutorials and online lessons are also made available for free to the general public. Research labs are encouraged to share their non-sensitive research data on a regional portal and to engage more proactively with national and international databases in line with the FAIR data principles (Findable, Accessible, Interoperable, Reusable).

RESULTS	REPRODUCIBILITY
The training enhances early-stage researchers' and administrative staff's understanding of open science principles, leading them to better tailor their data management systems.	Making research results available on a regional open portal (https://search-data.ubfc.fr/) interoperable with national and international portals fosters the development of more accessible research data within academia and beyond.



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Chercheurs-Or: Chercheurs pour l’Orientation (Researchers for university guidance)



SUMMARY: Doctoral students are provided with special training from science communication professionals to conduct university guidance at public high schools across the Bourgogne Franche-Comté region, providing students with a fleshed-out representation of what each academic field has to offer.

AREA OF ACTION: Knowledge transfer; public outreach.

OBJECTIVES	DESCRIPTION
Boost high-school students’ confidence that no matter what their personal background, academic achievements, or topics of interest are, they can find a university path they can strive in.	Doctoral students conduct 20-min-long discussion-based workshops with high-school students where they introduce their personal story and current field of study. They talk about their work as it really is: the day-to-day routine, the challenges, the doubts, but also the successes. High-school students can ask any questions they have, speak freely, and share their own perspectives. This direct interaction helps spark curiosity, reinforces the sense that pursuing higher education is a viable option, and provides a better understanding of the possible paths available after high school.

RESULTS	REPRODUCIBILITY
Students get a better idea of the diversity of courses offered at university and reinforce their confidence that they too can find their own path to success at university, no matter what their personal background is. High-school teachers get to further their knowledge of the current evolution of research and organization of studies in the different academic fields presented by the doctoral students. The examples provided by these young researchers can help them enrich their guidance content. Doctoral students get to witness the representation that young people can have of their field of research and, therefore, get to rethink their way of sharing their research with non-experts.	The Chercheurs-Or initiative has a high reproducibility rate. It requires limited funding and mostly relies on participants' goodwill and cooperation between universities and local schools. Guidance and best practices can be shared by the science communication experts at UBE to implement this program in other partner universities and regions of the FORTHEM Alliance.



CONTACT / WEBSITE

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Young Researchers Camp on Exploring Borderlands



SUMMARY: The Border and Regional Studies Institute at the University of Opole organizes every spring a research camp for young scholars from Poland and the Czech Republic. During five intensive days, MA and PhD students explore the Czech-Polish borderland, identifying contemporary and locally relevant challenges faced by communities in the region.

Participants work in international, interdisciplinary teams composed of students representing diverse academic backgrounds. This diversity enables them to combine different research methods, perspectives, and analytical approaches. A key element of the camp is the co-creation process, grounded in direct interaction with local actors, including mayors, local stakeholders, tourism operators, NGOs, schools, and residents.

Through this collaborative and engaged research model, young researchers not only deepen their academic competencies but also actively contribute to bridging the gap between science and society. The outcomes of their work serve a dual purpose. On the one hand, they bring local issues to the attention of the wider scientific community, highlighting challenges that might otherwise remain underrepresented in academic discourse. On the other hand, they provide locally grounded, practical recommendations and potential solutions that can support communities in addressing these challenges.

As a result, the camp generates tangible impact both in terms of scientific advancement and increased public awareness, fostering meaningful dialogue between academia and local communities.

AREA OF ACTION: Engaging local SMEs and other non-academic partners in exchange on topics of common interest.

OBJECTIVES	DESCRIPTION
The main objective of the camp initiative is to create a collaborative platform for meaningful exchange between academia and non-academic partners, in particular local public institutions, NGOs, and citizens, around topics of shared relevance in the Czech–Polish borderland. The project aims to: • Actively engage local stakeholders in knowledge exchange with students, doctoral researchers, and academic staff.	Camp is an annual initiative organized by the Border and Regional Studies Institute at the University of Opole in cooperation with a partner institution from Czechia: The Technical University in Liberec. The 2026 edition will mark the third iteration of the programme, confirming its sustainability and growing importance as a platform for cross-border collaboration.

OBJECTIVES	DESCRIPTION
• Foster mutual learning between academic and non-academic actors by integrating practical experience with research-based approaches. • Identify and analyse socio-economic challenges and opportunities relevant to local communities and businesses. • Support the co-creation of knowledge and solutions addressing the real needs of the borderland. • Strengthen cross-border cooperation and networks between institutions, businesses, and communities. • Develop participants' competences in interdisciplinary teamwork, stakeholder engagement, and applied research. • Promote the borderland as a shared socio-economic space shaped by collaboration and interdependence.	The camp brings together a diverse group of participants, including MA and PhD students of social sciences and humanities, academic teachers, and representatives of local communities. A distinctive feature of the initiative is the active involvement of non-academic partners—particularly local SMEs, tourism operators, NGOs, public officials, and residents—who are treated as equal contributors to the research and learning process. Over the course of an intensive, field-based programme, participants work in international and interdisciplinary teams to explore issues of common interest, such as cross-border economic cooperation, local development, tourism, cultural heritage, and everyday functioning in the borderland. Research activities are grounded in direct interaction with stakeholders and include interviews, workshops, site visits, and collaborative problem identification. The methodology is based on co-creation and knowledge exchange rather than one-directional research. Non-academic partners contribute their practical insights, experiences, and needs, while academic participants offer analytical tools and methodological support. This reciprocal process allows for a deeper understanding of local contexts and fosters the development of more relevant and applicable outcomes. The camp culminates in the presentation of results, which often take the form of analytical reports, thematic presentations, or practical recommendations tailored to the needs of local stakeholders. These outputs may also serve as a basis for further academic work and continued collaboration.

RESULTS	REPRODUCIBILITY
The initiative generates tangible benefits for both academic and non-academic participants. For local stakeholders, it provides an opportunity to articulate their challenges, gain new perspectives, and access analytical insights that may support their development strategies. Direct interaction with students and researchers fosters innovation, reflection, and the identification of new opportunities for cross-border cooperation. For academic participants, the camp enhances practical research skills, particularly in stakeholder engagement, interdisciplinary collaboration, and applied problem-solving. It also strengthens their ability to translate academic knowledge into socially relevant outcomes. At a broader level, the project contributes to building lasting relationships between universities and local communities, reinforcing trust and facilitating ongoing exchange. It supports the integration of scientific knowledge with practical experience, increases awareness of borderland-specific issues, and promotes a more inclusive and participatory model of research.	The Young Researchers Camp model is highly transferable and can be adapted to different regional and thematic contexts, particularly where there is a need to strengthen collaboration between academia and local stakeholders, including SMEs. Its key replicable features include: • The integration of students, researchers, and local community actors within a single collaborative framework. • A strong emphasis on co-creation and two-way knowledge exchange. • Field-based, problem-oriented learning focused on real-world challenges. • Flexible and interdisciplinary team structures. • Relatively low organizational barriers combined with high impact potential. The model can be implemented by higher education institutions in partnership with local and regional actors and scaled depending on available resources. Its cyclical, annual format allows for continuous improvement, the development of long-term partnerships, and the deepening of impact over time.

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Decentralised podcasting



SUMMARY: A decentralised approach to research podcasting where academic departments create subject-specific podcasts instead of maintaining one central university podcast. The university provides technical infrastructure, recording facilities, and design support, while research teams maintain complete control over content creation. This enables deeper exploration of specialised topics and reaches targeted audiences more effectively.

AREA OF ACTION: Science communication.

OBJECTIVES	DESCRIPTION
• Facilitate effective research communication through audio formats. • Reach niche audiences with specialised academic content. • Empower research groups to communicate directly with relevant audiences. • Support academic departments in developing their own communication channels. • Maximise engagement through targeted content rather than general interest approaches.	This approach involves a decentralised strategy for research podcasting: 1. Distributed Ownership: Enabling individual researchers, research groups, and academic departments to create and maintain their own subject-specific podcasts rather than managing one central university podcast. 2. Technical Support: Providing centralised technical infrastructure, including publication platforms, recording studios, and technical assistance without charge to academic departments. In addition, offering professional support for podcast elements such as audio jingles and graphics. 3. Content Autonomy: Allowing research teams complete editorial control and responsibility for content creation, scheduling, and production. 4. Specialised Focus: Encouraging deep exploration of specific subject areas rather than broad, general-interest content that may struggle to find a dedicated audience.



RESULTS	REPRODUCIBILITY
• Collective reach of approximately 140,000 listeners across ten active podcasts annually. • Highly successful specialist podcasts (e.g., on the periodic table, AI, and philosophy) achieving significant listener numbers. • Greater engagement through specialised content targeting interested audiences. • Enhanced research communication with minimal central resource requirements. • Improved accessibility to complex research topics through audio formats. • Empowered academic communities taking ownership of their communication channels.	To implement this approach at other institutions: 1. Required Resources: • Podcast hosting platform with analytics. • Recording facilities or equipment. • Technical staff for support and training. • Design capabilities for audio and visual elements. • Coordination mechanisms for quality assurance. 2. Implementation Steps: • Establish central technical infrastructure and support mechanisms. • Develop clear guidelines for podcast creation and maintenance. • Provide training for academic staff on podcast production. • Create templates for standard elements (intros, outros, graphics). • Implement tracking systems to measure collective impact. • Share success stories to encourage participation. 3. Success Indicators: • Number of active departmental podcasts. • Total and per-episode listener statistics. • Geographic and demographic reach of podcasts. • Engagement metrics (episode completion rates, subscriptions). • Growth in academic participation across disciplines.

CONTACT / WEBSITE

<https://www.uia.no/english/about-uia/employees/walternw/index.html>

<https://www.uia.no/podkast/>

Multi-use of news articles

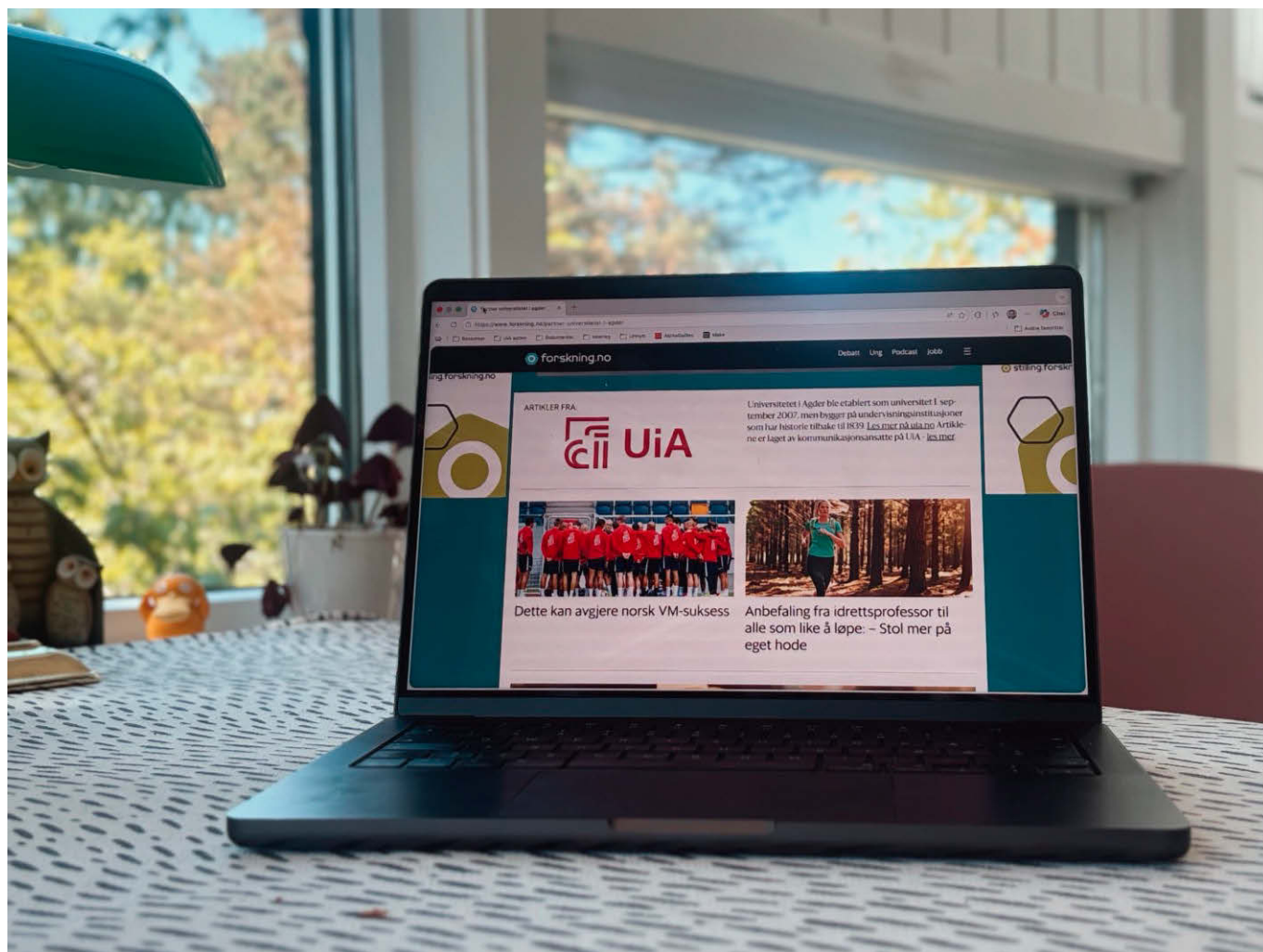


SUMMARY: A systematic approach to research communication that includes monitoring publications, interviewing researchers, ensuring quality control, and strategic media outreach with exclusive offers to targeted outlets before wider dissemination through research platforms and university channels.

AREA OF ACTION: Science communication.

OBJECTIVES	DESCRIPTION
• Maximise visibility of university research through strategic communication. • Establish effective pathways for disseminating research findings. • Build relationships with targeted media outlets. • Ensure accurate representation of research in public discourse.	This approach involves a systematic process for identifying and disseminating research: 1. Monitoring Publications: Daily monitoring of research publications by researchers from the University of Agder. 2. Content Selection: Evaluating publications to determine which findings merit broader dissemination. 3. Researcher Engagement: Interviewing researchers to develop accessible narratives around complex research. 4. Quality Assurance: Two-stage verification—internal review followed by researcher fact-checking. 5. Strategic Media Outreach: Targeting specific media outlets based on subject relevance, offering exclusive coverage rights to ensure a higher likelihood of success. 6. Multi-platform Publishing: Following initial media coverage, disseminating content through research platforms (Forskning.no in Norway) and university channels.

RESULTS	REPRODUCIBILITY
• Enhanced visibility of university research across multiple platforms. • Increased media coverage in relevant outlets. • Improved accuracy in public reporting of research. • Strengthened relationships with media partners. • Greater public engagement with research outputs. • Expanded reach through strategic publication sequencing.	To implement this approach at other institutions: 1. Required Resources: • Communications staff with research understanding. • Systems for monitoring publications. • Established relationships with researchers. • Connections with media outlets. 2. Implementation Steps: • Establish a monitoring system for research outputs. • Develop criteria for selecting research with communication potential. • Create interview protocols for researchers. • Design quality assurance workflows. • Build media contact databases by subject specialisation. • Establish relationships with research communication platforms. 3. Success Indicators: • Quantity and quality of media coverage. • Reach metrics across publishing platforms. • Growth in media requests for expert commentary. • Increased visibility of institutional research in public discourse.



CONTACT / WEBSITE
<https://www.uia.no/english/about-uia/employees/walternw/index.html>



Media expert list



SUMMARY: A strategic approach to media engagement through an expert list organised by public-interest topics. The practice identifies researchers comfortable with media appearances and proactively connects them with journalists. This is achieved through targeted distribution of expertise lists and dedicated media contact points.

AREA OF ACTION: Science communication.

OBJECTIVES	DESCRIPTION
• Increase visibility of university researchers in media coverage. • Facilitate media access to relevant academic expertise. • Proactively connect journalists with appropriate university experts. • Build awareness of the university as a valuable source of expert commentary.	This approach involves creating and maintaining a strategic expert list for media engagement: 1. Category Development: Establishing media-friendly categories (not internal academic divisions) such as workplace issues, economics and law, childhood and development, sports, health and exercise, culture, nature and environment, society, and technology. 2. Expert Identification: Monitoring daily media coverage to identify university researchers who are already comfortable with media engagement. 3. Proactive Recruitment: Approaching researchers who have successfully engaged with media to join the expert list. 4. Online Publication: Publishing the comprehensive expert list on the university website's dedicated section for media. 5. Targeted Distribution: Creating and distributing topic-specific mini-lists to media outlets based on the news cycle, annual events, or emerging issues. 6. Central Contact Points: Designating specific media relations contacts to assist journalists with expert inquiries not directly addressed by the list. 7. Database Management: Maintaining a comprehensive Excel database with keywords and cross-references for internal use and tracking media inquiries.



RESULTS	REPRODUCIBILITY
• Increased rate of university researchers quoted in the media. • Enhanced visibility of university expertise across diverse subject areas. • Improved journalist access to relevant academic sources. • Stronger relationships between the university and media outlets. • Greater public awareness of the university's expertise and research. • More efficient handling of media inquiries. • Systematic approach to tracking and documenting media engagement.	To implement this approach at other institutions: 1. Required Resources: • Staff for media monitoring and database management. • Web platform for publishing expert lists. • Systems for tracking media inquiries. • Dedicated media relations contacts. 2. Implementation Steps: • Develop media-relevant categories that transcend academic departments. • Monitor media for researchers already engaging successfully. • Create and maintain a searchable database of experts. • Publish an accessible online version for journalists. • Establish processes for creating topic-specific expert lists. • Track and analyse media engagement metrics. 3. Success Indicators: • Quantity of media appearances by listed experts. • Diversity of media outlets engaging with university experts. • Growth in unsolicited media inquiries. • Breadth of topics covered by university experts in media. • Positive feedback from journalists and researchers.

CONTACT / WEBSITE

<https://www.uia.no/english/about-uia/employees/walternw/index.html>

<https://www.uia.no/om-uia/pressekontakt/eksperter/>



Research Grand Prix



SUMMARY: A live annual research communication show in the form of performative four-minute on-stage presentations by competing and professionally coached PhD students in front of a general audience. Participants benefit from professional coaching in presentation skills, while audiences experience engaging explanations of complex research. Winners progress from regional to national and international competitions.

AREA OF ACTION: Science communication.

OBJECTIVES	DESCRIPTION
• Create an accessible and entertaining platform for engaging face-to-face re-search communication. • Make complex research accessible, fun, and inter-esting for general audi-ences. • Strengthen direct re-searcher-to-public com-munication and engage-ment. • Develop lasting, crea-tive presentation skills that benefit researchers throughout their careers.	This approach involves organising an annual research communication compe-tition: 1. Project Structure: Establishing a project team with a dedicated project lead-er responsible for coordinating all aspects of the competition. 2. Recruitment: Inviting PhD students from the university, regional hospitals, and other research institutions to apply by describing their research and mo-tivation for participation. 3. Selection Process: Reviewing applications and selecting approximately nine candidates to participate in the competition. 4. Comprehensive Training: Providing participants with extensive communi-cation training through three group sessions and two periods of individual coaching, covering research communication, stage presence, voice, body language, and visual presentation. 5. Competition Format: Organising a public show where PhD students pres-ent their research in four minutes to a general audience in an entertaining and accessible manner. 6. Evaluation System: Implementing a dual assessment approach with audi-ence voting and a professional jury evaluating presentation skills and com-munication effectiveness. 7. Progressive Competition: Enabling regional winners to advance to a nation-al final and potentially to international competitions hosted by FORTHEM.

RESULTS	REPRODUCIBILITY
• Increased public engagement with science and research through an entertaining and accessible event. • Creation of an accumulated cohort of researchers with exceptional presentation skills, capable of effectively explaining complex topics to non-specialists. • Stronger connections between academic institutions and the wider community. • Improved transfer of knowledge from academia to society.	To implement this approach at other institutions: 1. Required Resources: • Project team (30-40 people involved in various capacities, including a project manager and a core team consisting of a handful of specialists). • Coaching specialists in research communication and presentation skills. • Venue for the final show with professional stage sound and lighting. • Professional show producer. • Marketing and communication support. 2. Implementation Steps: • Begin planning at least 7-8 months before the event (February for a September show). • Secure institutional leadership support and endorsement. • Establish clear timelines. • Book appropriate venues for training and the final show. • Recruit professional trainers and presenters. • Develop a forward-leaning marketing strategy to ensure audience attendance. • Coordinate with regional and national competition organisers. 3. Success Indicators: • Quality of participant presentations. • Audience attendance and engagement. • Media coverage of the event. • Participant feedback on training value. • Long-term impact on researchers' communication abilities.



CONTACT / WEBSITE

<https://www.uia.no/english/about-uia/employees/jano/index.html>
<https://www.uia.no/english/about-uia/news/join-the-researcher-grand-prix-2025.html>



KTH Innovation Readiness Level™



SUMMARY: With this tool, you get a snapshot of the company's maturity and a solid foundation for further development. You assess the areas of customer, technology, business model, IPR, team, and funding across 9 levels, and receive a visual summary and a snapshot of the company's maturity.

AREA OF ACTION: Knowledge transfer, support.

OBJECTIVES	DESCRIPTION
The goal of the KTH Innovation Readiness Level™ model is to provide users with a structured method for evaluating and developing their innovation projects. The model helps users identify strengths and weaknesses within key areas crucial for technology maturation. This provides users with valuable insights and guidance to make informed decisions and promote further development.	The KTH Innovation Readiness Level™ (IRL) model is a comprehensive framework designed to guide the development of innovative ideas from inception to market readiness. Customer Readiness Level (CRL) ensures that innovations address real market demands by validating customer needs early in the process. Technology Readiness Level (TRL) assesses the feasibility and reliability of the technology through rigorous testing. Business Model Readiness Level (BRL) evaluates the financial and social viability of the business concept, ensuring a clear strategy for sustainable scaling. Intellectual Property Readiness Level (IPRL) focuses on securing necessary IP rights to protect the innovation. Team Readiness Level (TMRL) assesses the skills and cohesion of the team driving the project. Funding Readiness Level (FRL) ensures that adequate funding is secured for market entry and scaling.

RESULTS

This tool was adopted by innovation advisors at the University of Agder (UiA) in the fall of 2024. It has been very useful in highlighting the decisions and development tasks that need to be addressed. The tool has also been used in discussions with academic staff who have socially innovative ideas, and with some adjustments, it has proven valuable in these contexts as well.

REPRODUCIBILITY

The tool is internationally recognized and easily accessible. It is simple to use in one-on-one meetings, as well as a working tool for employees who wish to explore their own ideas.



CONTACT / WEBSITE

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<https://www.kth.se/en/om/innovation/om/nyheter/kth-s-innovationsmodell-sprids-over-varlden-1.1059858>



DigIntMentoRes: Interdisciplinary mentor programme for research in a digital teaching-learning setting



VNIVERSITAT
D VALÈNCIA

SUMMARY: This initiative is part of the “Person-centered interdisciplinary digitalization for a sustainable education. Open Educational Resource” [Digitalización interdisciplinar centrada en la persona para una educación sostenible. Recurso Educativo Abierto] framework.

AREA OF ACTION: Training researchers in technology and knowledge transfer: curricula, micro-credentials, summer schools, industrial PhDs, TTO/KTO roles, mentoring, and impact assessment.

OBJECTIVES	DESCRIPTION
To design and implement interdisciplinary peer learning and mentoring programmes. • To promote an integral lifelong learning based on knowledge, skills, attitudes, competencies, and values. • To strengthen cooperation between academic institutions (e. g., universities, non-higher education institutions) and social agents (e. g., NGOs, libraries).	This initiative has been implemented in a course in psychology at the University of Valencia, which involved two groups of undergraduate students conducting collaborative research projects in a digital teaching-learning setting. In addition, one professional student enrolled in a higher vocational education and training (VET) programme in computer network systems management was incorporated, who developed his technical training in the workplace at the university. This experience combines various approaches and strategies to establish a sustainable mentoring programme that incorporates various forms of interactions: professional student-company tutor dyadic mentoring, academic mentoring, professional mentoring, and peer learning.

* Estreder, Y. (2026). *Digitalización interdisciplinar centrada en la persona para una educación sostenible*. Recurso Educativo Abierto. Universitat de València. <https://hdl.handle.net/10550/123705>

RESULTS	REPRODUCIBILITY
Some expected effects: • To transfer this learning into participants' life domains (e.g., social, family). • To develop teaching-learning settings which facilitate personal and professional development. • To foster sustainable experiences which can be used to promote equality, diversity, and inclusion.	This activity can be scaled up in other similar institutions.

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Mind Innovation in Food and Feed to rate nutrients and safety in a healthy and preventive perspective



VNIVERSITAT
D VALÈNCIA

SUMMARY: The Mind Innovation in Food and Feed initiative promotes innovative, sustainable, and safe practices in human and animal nutrition from a preventive health perspective. It combines interdisciplinary training, entrepreneurship, and knowledge transfer to support the development of impactful solutions. The project fosters collaboration, capacity building, and the creation of scalable models addressing environmental, nutritional, social, and economic challenges.

AREA OF ACTION: Training researchers in technology and knowledge transfer.

OBJECTIVES	DESCRIPTION
To identify and promote innovative, sustainable, and safe practices in human and animal nutrition; to strengthen participants' entrepreneurial and interdisciplinary skills through targeted training; and to foster collaboration and knowledge exchange to support the development, dissemination, and scalability of impactful solutions across environmental, social, educational, and economic domains.	The “<i>Good Practices</i>” framework developed within the <i>Mind Innovation in Food and Feed to rate nutrients and safety in a healthy and preventive perspective</i> initiative aims to systematically identify, analyse, and promote innovative approaches to sustainable, safe, and high-quality nutrition in both human and animal food systems. This framework is grounded in an interdisciplinary perspective that integrates food safety, nutritional quality, and environmental sustainability as key pillars for advancing preventive health and responsible consumption. The initiative provides participants with structured opportunities to develop and refine innovative ideas into feasible entrepreneurial projects. Through targeted training activities and competence-based learning methodologies, participants acquire essential skills in innovation management, business development, and project design. Furthermore, the programme fosters collaboration and networking, enabling knowledge exchange and the co-creation of solutions with potential impact across environmental, gastronomic, educational, social, and economic domains.



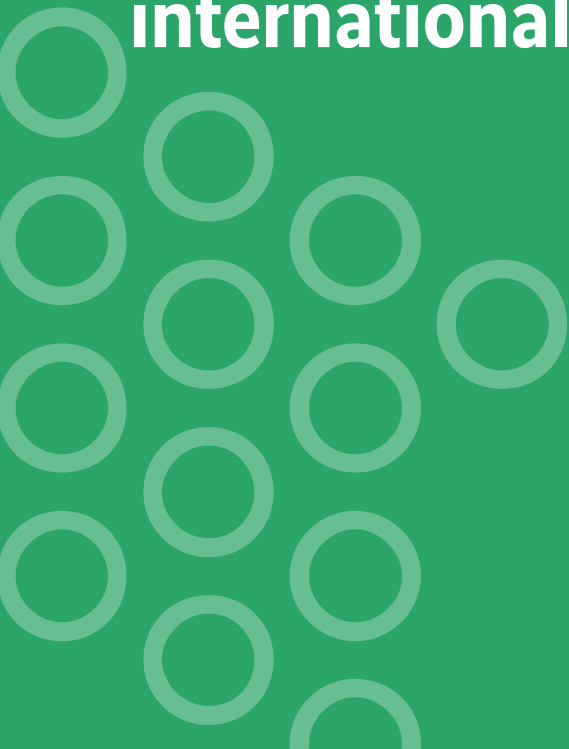
RESULTS	REPRODUCIBILITY
The outcomes derived from this initiative demonstrate a multidimensional impact that aligns with current priorities in sustainable development and public health. From an environmental perspective, the initiative promotes practices that contribute to resource efficiency, waste reduction, and the transition towards more sustainable food production and consumption systems. In terms of health and nutrition, it supports the development of safer and nutritionally optimized products, reinforcing preventive approaches to well-being and reducing risks associated with poor dietary habits. Additionally, the initiative generates significant educational impact by enhancing participants' competencies in key areas such as food safety, nutrition science, and entrepreneurship. This contributes to capacity building and supports the development of a skilled workforce capable of addressing emerging challenges in the agri-food sector. From a socio-economic standpoint, the initiative encourages the creation of innovative business models and entrepreneurial ventures, thereby fostering economic growth, job creation, and social inclusion.	The reproducibility of the “Good Practices” identified within this initiative constitutes a critical factor in ensuring their long-term relevance and scalability. These practices are designed with a high degree of transferability, allowing their implementation across diverse geographical, cultural, and socio-economic contexts. Their adaptability is supported by a flexible methodological framework that can be tailored to specific local needs and constraints. Moreover, systematic documentation and dissemination of results facilitate knowledge transfer and enable other stakeholders, including educational institutions, policymakers, and industry actors, to replicate and build upon successful practices. The emphasis on competence development and experiential learning further enhances reproducibility, as participants are equipped with transferable skills that can be applied in different settings. In addition, the establishment of collaborative networks and partnerships contributes to sustained knowledge exchange and increases the potential for scaling up and replicating effective solutions.

RESULTS	REPRODUCIBILITY
Overall, the initiative empowers individuals to become active contributors to a more sustainable and health-oriented food ecosystem.	Overall, the initiative ensures that the identified good practices can serve as replicable models, supporting broader systemic change towards sustainable, safe, and health-oriented food systems. As a result, these practices have the potential to generate long-term, widespread impact by inspiring similar initiatives and contributing to the transformation of food systems toward sustainability and health.

CONTACT / WEBSITE

UV Entrepreneurship Office: <https://www.uv.es/uv-empren/ca/uvempren.html>
Detailed work- Publicacions UV (PUV): <https://puv.uv.es/innovacion-y-emprendimiento-en-productos-tecnicas-y-seguridad-en-el-sector-agroalimentario.html>

THEMATIC AREA 3:
Evaluating success stories
and opportunities for international
start-ups: metrics, scalability factors,
internationalization, alliances, funding,
risks, and limitations





Structures for success – FUTURY & GUTENBERG innovate (JGU Mainz)



JOHANNES GUTENBERG
UNIVERSITÄT MAINZ

SUMMARY: Futury - together with the GUTENBERG Innovate, including the former Startup Center - forms a powerful, industry- and research-driven start-up ecosystem in the Rhine-Main region. They support science- and technology-based startups from ideation to scaling, combining academic know-how, co-working infrastructure, coaching, funding access, and international growth support. The model fosters successful spin-offs and international start-ups rooted in university research.

AREA OF ACTION: Evaluating success stories and international Start-Ups, Start-up & Innovation Ecosystem, Technology & Knowledge Transfer.

OBJECTIVES	DESCRIPTION
By offering structured support - from business model development through funding and scaling - Futury and GUTENBERG Innovate want to enable research-driven spin-offs, foster entrepreneurship among students and scientists, and help build a robust, sustainable startup hub in the Rhine-Main region. They both aim to accelerate the translation of academic research into market-ready and scalable enterprises.	GUTENBERG Innovate provides counselling, mentoring, business-model support, IP support, funding-application assistance (e.g., for national programs such as EXIST), co-working space, and workshops (e.g., “From PhD to Innovator”, “Your Research Canvas”, life-science entrepreneurship programs) for JGU students, doctoral candidates, postdocs, and early researchers with knowledge- or technology-based startup ideas. In 2025, together with other Rhine-Main universities and under the umbrella of Futury, the initiative launched the RheinMain Startup Factory to bolster the startup ecosystem. This includes structured programs across the full founding lifecycle, access to industry partners, capital via venture funds, incubation, as well as acceleration support, and a support network for international growth and scaling.

RESULTS	REPRODUCIBILITY
Futury reports to support over 130 startups, linking them to a network of more than 130 industry partners, facilitating pilot projects, funding, and scaling. Through the collaboration with JGU, the ecosystem now integrates university-based researchers and their spin-offs into a broader regional and international startup environment.	The model can be replicated by other universities or regions willing to connect academic research with industry and investors, especially SMEs. Key transferable elements are a dedicated university-based startup centre offering counselling, funding support, co-working infrastructure, and mentoring. Integration with a larger regional 'startup factory' that combines multiple universities, industry partners, and shared resources, structured lifecycle support, and collaboration across institutions would be a cohesive next step. With institutional buy-in, external funding (e.g., governmental), and industry networks, the approach is scalable to other research hubs aiming to nurture international spin-offs.



CONTACT / WEBSITE

GUTENBERG innovate: <https://innovate.uni-mainz.de/>

Futury: <https://www.futury.eu/>



MyDigiCoop – Fostering Digital and Social Cooperative Entrepreneurship for the Digital Age



UNIVERSITATEA
LUCIAN BLAGA
— DIN SIBIU —

SUMMARY: MyDigiCoop is an Erasmus+ Strategic Partnership project that promotes digital social cooperative entrepreneurship in higher education. By developing innovative educational resources, the project supports the integration of cooperative values into digital entrepreneurship training, preparing students and professionals to respond to social challenges with sustainable, inclusive, and technology-driven solutions.

AREA OF ACTION: Higher Education, Social and Digital Entrepreneurship, Pedagogical Innovation.

OBJECTIVES	DESCRIPTION
• To enhance entrepreneurial education in higher education by introducing digital and social cooperative entrepreneurship concepts. • To develop innovative tools, methodologies, and resources to support educators and learners. • To promote socially responsible and sustainable entrepreneurial practices in the digital economy. • To build a network of educators and practitioners for sharing best practices in cooperative entrepreneurship.	MyDigiCoop brings together universities and organizations from different European countries to co-create educational materials and tools that embed cooperative values into digital entrepreneurship training. The project has developed resources such as an educational framework, a training program for educators, and a digital toolkit for learners. These outputs support both students and academic staff in understanding and applying cooperative entrepreneurship models in a digital context. By fostering collaboration, inclusiveness, and sustainability, the project contributes to shaping the next generation of entrepreneurs equipped to address societal and environmental challenges.

RESULTS	REPRODUCIBILITY
• Mapping HE students' entrepreneurial and cooperative profiles. • Development of training programs and resources for educators in higher education. • Launch of an online toolkit with interactive learning materials for students. • Strengthened cooperation among European universities in the field of entrepreneurship education.	The MyDigiCoop methodology and tools are openly available and adaptable for other higher education institutions or training providers. The framework can be integrated into existing entrepreneurship curricula or used to inspire new educational initiatives. Its open-access resources facilitate replication in diverse cultural and institutional contexts.



Consortium Partners:

- HUHEZI – Faculty of Humanities and Education Sciences, Mondragon University (Spain)
- Lucian Blaga University of Sibiu (ULBS, Romania)
- Haaga-Helia University of Applied Sciences (Finland)
- Senior Europa Sociedad Limitada (Kveloce, Spain)
- Gestionet Multimedia, S.L. (Spain)
- ACEEU – Accreditation Council for Entrepreneurial and Engaged Universities (Germany)

CONTACT / WEBSITE

<https://mydigicoop.eu/>; info@mydigicoop.eu or valentin.grecu@ulbsibiu.ro



Europa Master Transnational Community & EMA-DOM Network



SUMMARY: Europa Master is a joint master's programme delivered by the University of Opole, Johannes Gutenberg University Mainz, and Université Bourgogne Franche-Comté, where students study across Poland, Germany, and France. This intensive mobility experience has led to the creation of EMA-DOM, a student-led alumni network that sustains a strong transnational community fostering long-term academic, social, and professional connections.

AREA OF ACTION: Operational recommendations for partner universities in their local environments: governance, internal incentives, IP management, public/private funding, regional innovation policies.

OBJECTIVES	DESCRIPTION
The initiative aims to combine high-quality transnational education with the development of a lasting international community. It supports students in navigating academic and everyday life across three countries while fostering intercultural competencies. A key objective is to maintain a self-sustaining alumni network that enables knowledge sharing, peer support, and long-term professional collaboration beyond graduation.	Europa Master is a two-year joint degree programme in which students study successively in Opole, Mainz, and Dijon, experiencing different academic systems, languages, and cultures. This intensive mobility creates strong interpersonal bonds but also challenges related to relocation and adaptation. In response, students founded EMA-DOM in 2015 as an independent association connecting cohorts across years and countries. The network provides practical guidance on studying and living in each location, supports integration, and facilitates knowledge transfer between generations. It also organizes academic, cultural, and social activities, reinforcing a shared identity. As a result, a multi-level community has emerged, linking students, alumni, and institutional partners across Europe.

RESULTS	REPRODUCIBILITY
The initiative has produced a cohesive and active transnational community that extends well beyond the duration of studies. Students benefit from peer support and smoother adaptation to mobility, while alumni remain engaged through professional networking and collaboration. The network strengthens intercultural understanding and contributes to career development across European and international institutions.	The model provides operational insights for universities implementing transnational programmes. Key recommendations include embedding student-led alumni structures as complementary governance mechanisms, ensuring continuity through intergenerational leadership, and leveraging alumni networks as strategic partners in external engagement. Universities can use such networks to strengthen links with public institutions, support student mobility, and enhance programme sustainability through diversified funding and partnerships.

CONTACT / WEBSITE
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www.ema-dom.eu

THEMATIC AREA 4:
**Operational recommendations
for partner universities in their local
environments: governance, internal
incentives, IP management,
public/private funding, regional
innovation policies**



Université Bourgogne Europe Foundation



SUMMARY: Université Bourgogne Europe Foundation centralizes sponsorship from individuals and private entities looking to contribute to scientific progress and the public interest.

AREA OF ACTION: Charity.

OBJECTIVES	DESCRIPTION
Collect private funds to support the academic community's projects.	The Université Bourgogne Europe was founded in November 2023, intending to receive support from external actors and individuals. Support is accepted in the form of financial sponsorship, in-kind sponsorship (equipment, products, services, licenses, data, etc.), or by providing skills through the provision of staff and consulting. Contributions can be made for a specific project or have undefined purposes.

RESULTS	REPRODUCIBILITY
Sponsors contribute to the funding of high-impact research and innovation by supporting projects of excellence to advance scientific and societal progress. They can also benefit from tax exemptions as a reward for their good deed.	University foundations are a trusted means of engaging external actors and gathering financial support to fund academic projects. Most countries' national legislation easily allows their creation and recognizes them as non-profits.

CONTACT / WEBSITE
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UNIPA for Cultural Heritage – Beyond the Valley - Public Value



Università
degli Studi
di Palermo

SUMMARY: The University of Palermo, increasingly called to play a strategic and driving role in the cultural, social, and economic development of the territory, in collaboration with local institutions and stakeholders inside and outside the University, has defined its own program for the production and management of cultural assets. According to UNIPA's strategic plans, some initiatives have been planned and executed for "Agrigento Capital of Culture 2025" as well.

AREA OF ACTION: An interdisciplinary and trans-disciplinary Programme for the enhancement of Cultural Heritage.

OBJECTIVES	DESCRIPTION
• Public Engagement initiatives beyond UNIPA structures in local and regional cultural Structures (museums, archaeological parks, UNIPA Museum system, old-fashioned libraries, etc.). • Promoting the principle and sustainability of Cultural Heritage. • Knowledge and competencies transfer from the academic to a non-academic public. • Upskilling with diagnostic laboratory practices led by a PhD early-stage researcher. • Creating useful tools for authors, Cultural Heritage users, and providers. • Public Value also from a sustainability perspective for Cultural Heritage tourism.	In 2023 UNIPA subscribed to Collaboration Agreement Framework for Common Interests stipulated with the Department of Cultural Heritage and Sicilian Identity (<i>Assessorato dei Beni Culturali e dell'Identità Siciliana</i> Prot. 182937-20/11/2023 – Agreement n. 4351/2023), planning numerous initiatives for the valorization of knowledge, transfer of skills, through Public Engagement events, aimed at strengthening, in the territories of reference of the University, the development of the new era of the Knowledge Based Society, through Life Long Learning activities, cascading training plans and dissemination programs, increasing the direct and bi-directional relationship in the supply chain from education to higher education, through the valorization of knowledge, research results and innovative teaching.

RESULTS

Below are the Third Mission/Social Impact initiatives of the University co-designed with local authorities and stakeholders and implemented within the framework of the aforementioned University-Department Collaboration Agreement, which aims to implement programs of common institutional interest and projects for the enhancement of the cultural heritage, taking into account the Strategic Line: The Third Mission for a university at the service of the territory.

Starting with a Workshop on “*Planning a Doctoral Network TheSPIS – Theaters, Sanctuaries, Performance: Interaction and Sustainability*” (03-04/07/2023), UNIPA has been financed by the European Commission with Grant Agreement Horizon Europe MSCA Doctoral Networks 101223894- TheSPIS in April 2025.

Workshop entitled “Digital Numismatics and interdisciplinary interconnections” (27/11/2023, Department of Cultures and Society), organized as a culmination of the *Nummi Digitali* project undertaken since 2021 by the University in collaboration with the “Antonino Salinas” Museum and ICT firms. The initiative involved several specialists in Numismatics and Cultural Heritage, specifically dealing with innovative technologies at the service of the Sicilian numismatic heritage, coordinated by Dr. Lavinia Sole.

Event “*Work in progress. Studies and tools for the Medagliere*” at the Regional Archaeological Museum “Antonino Salinas” in Palermo (02/06/2024) curated by researchers and teachers from the Departments of Cultures and Society and STEBICEF (L. Sole, F. Armetta, M.L. Saladino) and the CNR (R. Ponterio, D. Giuffrida), with the support of students from the courses in Cultural Heritage: laboratory activities were carried out, during which some of the coins from the Museum’s collection, which until now had not been available to the public, were shown in person.

Study day “Mozia: Crossroads of Knowledge. Archaeology and Archaeometry for the study of ancient poliorcetica” (Mozia, 02/07/2024), dedicated to the presentation of the results of the interdisciplinary project, conducted by Dr. Francesco Armetta of the STEBICEF Department in close collaboration with Dr. Paola Sconzo of the Department of Cultures and Society, concerning the war arsenal used during the Syracusan siege of the island of Mozia at the beginning of the 4th century BC, with the participation of professors and researchers from the two departments (R. Sammartano, E. Occhipinti, S. Orecchio) and from the DiFC “E. Segrè” (F. Lo Celso) (<https://www.unipa.it/Giornata-di-studi-Mozia-Crocevia-di-Conoscenze-Archeologia-e-Archeometria-per-lo-studio-della-poliorcetica-antica/>). The initiative was also included among the pre-events of the SHARPER project - European Researchers’ Night 2024, funded by the European Commission (GA 101162370).

RESULTS

Study day “Knowledge, conservation and valorisation of the castle heritage in Sicily” (03/08/2024) organized by Prof. Renata Prescia at the Department of Architecture of the University (<https://www.unipa.it/Conoscenza-conservazione-e-valorizzazione-del-patrimonio-castellano-in-Sicilia/>).

Parco di Lilibeo – Marsala in collaboration with the STEBICEF and Culture and Society Departments of the University: dissemination meeting to present to the non-academic public the first results of the PNRR project “SAMOTHRACE” – Cultural Heritage line (12/07/2024), curated by professors Maria Luisa Saladino, Elisa Chiara Portale, and Delia Chillura Martino.

“Ancient coins between knowledge and the culture of legality”, training days aimed at the high schools of Palermo (teacher training and PCTO for students), organized by Prof. Elisa Chiara Portale and Dr. Lavinia Sole, held at the Regional Center for Planning and Restoration of Palermo (18-19/12/2024) and with the collaboration of the same and of the “Antonino Salinas” Museum and of the Cultural Heritage Protection Unit of the Carabinieri. The aim was to promote dialogue between researchers, technicians, and guardians of legality, on the one hand, and students and teachers at secondary schools, on the other, to spread scientific culture and the culture of legality in a stimulating context, with training moments alternating with laboratory and dynamic scientific activities.

The initiative “The school adopt a cultural Heritage site for “Agrigento Capital of Culture 2025” with cascade training plans provided by UNIPA teachers and researchers with research results, knowledge and competences transfer toward to secondary teachers (march- June 2025) and form secondary school to students (September – October) followed by students to general public (citizens and tourists) (October – December 2025) with the publishing of a text dealing with the description of Cultural heritage site beyond the Temple Valley of Agrigento, with a book “Beyond the valley” for Public value.

The enhancement of Cultural Heritage, which has been implemented, for example, in the case of “Digital Nummi”, the necessary connection between the regional system and the national cataloguing system, through further collaborations with the historical Library (funded by Archbishop of Agrigento Andrea Lucchesi Palli in 1765) in Agrigento <https://www.bibliotecalucchesianaagrigento.it/medagliere/la-storia/> with the creation of a platform <https://www.bibliotecalucchesianaagrigento.it/monete/>.

RESULTS

UNIPA Museum system <https://musei.unipa.it/> has been valued with Palermo Classic Agreement <https://www.unipa.it/Palermo-Classica/>, enhancing Public Engagement with knowledge transfer through musical activities with international classic festival and UNIPA Polifonic UniSonus Palermo Chorus <https://www.unipa.it/Nasce-UniSonus-Palermo--Il-coro-dellUniversit-degli-Studi-di-Palermo/> within Rectorate site Palazzo Steri, with 1600 attendees enjoying music in a cultural heritage environment.

REPRODUCIBILITY

From this overview, relating only to the Third Mission initiatives organized within the scope of the Interinstitutional Collaboration Agreement between the University of Palermo and the Regional Department of Cultural Heritage and Sicilian Identity in its first year of life, it emerges how the network of interinstitutional collaborations has been expanded and continues to expand, especially at a regional level, but also nationally and internationally, how the number and quality of individual initiatives has grown, with a systemic, dynamic and functional approach aimed at Therefore, the results of research and study projects typically conducted within the University have been the basis and driving force for initiatives in the field of “Production, management and valorization of artistic and cultural assets” (restoration, archaeology, art history) projected externally, intensifying relations with Policy Makers and Heritage Bodies and increasing the impact of training and research on cultural assets in terms of conservation and valorization (projects for the conservation, cataloguing and digitization), initiatives and projects for dissemination and education on heritage - a field to which the University has dedicated a Master’s Degree, opened at the Agrigento site, with the collaboration of the Institutes of the BBCC and IS Department for some teaching and teaching activities.

CONTACT / WEBSITE

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UNIPA for the Territory – “Diffused University – Università Diffusa”



Università
degli Studi
di Palermo



SUMMARY: UniPA Governance includes the “Università diffusa” Project in Strategic Line 3, including it as an objective of the University Strategic Plan 2024-2027 for the pursuit of “Public Value” with LS3: *the Third Mission for a University at the service of the territory*.

The project “Diffused University” aims to make the University of Palermo’s expertise available to citizens on topics such as the environment, Justice, wellness, health, and historical and cultural heritage, digital and green transition, according to local territory educational needs.

Each of the topic courses led by UNIPA professors is free of charge.

These courses, conducted using popular language and with open, participatory, and “listening” methods, each require a total time commitment of 25 hours and will be held at the premises of the other partner institutions, which will establish their own shifts for making the premises available, usually in the afternoon. A quota of 5 hours will be reserved for the preparation of the teaching material by the teacher and for personal study by the student. Therefore, the teaching staff will be engaged in classroom lessons for only 20 hours.

AREA OF ACTION: An interdisciplinary and trans-disciplinary Programme based on Public Engagement outside of university classes and labs for Knowledge and competencies transfer and valorisation.

OBJECTIVES

UNIPA strategic Objective 3.2: Strengthen public engagement initiatives to foster stable relationships between the University and citizens - Action: Provide continuity and develop the “Università diffusa” program to foster the cultural, social and economic growth of the population even outside of university study programs, pursuing the following Sustainable Development Goals 2030 Agenda: 4 – Quality education 8 – Decent work and economic growth 9 – Business, innovation and infrastructure 10 – Reducing inequalities 11 - Sustainable cities and communities.

Knowledge and competencies transfer from academic to a non-academic public with an innovative approach and different linguistic registers according to local Associations and Schools’ educational needs.

DESCRIPTION

The project “Diffused University / Università Diffusa” has been implemented since 2022, aiming to make the University of Palermo’s expertise available to citizens on various topics such as the environment, health, and historical and cultural heritage.

2023 – UNIPA implemented the second edition of the “Diffused University” project in partnership with the Comprehensive Institute “Colozza-Bonfiglio”. Magg. “Regina Margherita,” the Classical High School “Vittorio Emanuele II,” the S. “Benedetto Croce” High School, the “Lombardo Radice” Comprehensive Institute of Palermo, and the “Parco del Sole” Association. UNIPA developed the “Diffused University” in collaboration with various schools and voluntary associations, choosing neighbourhoods such as the *Ballarò district* as one of the reference areas. UNIPA offered the courses to girls and boys (starting from 15/16 years old) attending or not attending schools, but also adults of any educational level, and therefore conducted with an informative language and with open and participatory methods, therefore, “listening”.

2024 – The third edition of the “Diffused University” project was developed, offering 15 Public Engagement initiatives with several thematic courses aimed at both girls and boys (starting from 15/16 years old) and adults of any school level according to the EU Lifelong Learning policy. The thematic “Paths” Public Engagement Initiatives are indicated in the following link:

<https://www.unipa.it/7236aadc-2283-11ef-a03a-005056010139/>

2025 – Since April 2025, UNIPA has invited local stakeholders to meet and participate in the first phase of educational project planning to co-design the thematic “Paths” of the fourth edition to enhance and strengthen the relationship with neighborhoods and their own local citizens’ educational needs.

RESULTS	REPRODUCIBILITY
The project started with its first edition (academic year 2022-2023), activating 7 Paths with the involvement of 5 schools and 2 associations with 40 participants. In 2023 (second edition), approximately 350 people participated; the majority were students from schools in the <i>Ballarò</i> area. In 2024 (third edition), UNIPA offered: • Palermo: 15 Thematic “Paths” with 214 registered attendees, 5 “Paths” with 89 certificates issued (25 hours). • Trapani: 1 offered thematic “Path” with 218 registered attendees with realised certificates (10 hours). In 2025 (fourth edition) – 96 associations and schools of Palermo and 2 schools of Trapani have been invited to co-design the new thematic “paths” to be offered during September- December 2025.	From this overview, relating to the University of Palermo Third Mission, the “Diffused University” project initiatives have been organized within the scope of enhancing a synergy through a bi-directional relationship with local territory stakeholders, reinforcing UNIPA’s presence and action to lead economic, social, and educational development.

CONTACT / WEBSITE

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European Researchers' Night and Researchers at Schools| SHARPER Palermo



Università
degli Studi
di Palermo

SUMMARY: SHARPER - Sharing Researchers' Passion for Education and Rights is a project funded by the European Commission aimed at involving citizens in research and sensitising them to the role of researchers in society.

SHARPER interprets the Researchers' Night as a social event to share the passions that animate researchers in their work with the general public. Since the very beginning, it has been characterized by two main aspects: a) the use of streets, squares, and other urban places as outdoor labs to talk about research and experiment with it publicly, b) the collaboration between researchers and communicators to find new forms of public involvement and to provide researchers with training opportunities in the field of communication. In 2024-25, SHARPER involves 15 Italian cities.

AREA OF ACTION: Open science, Science communication.

OBJECTIVES	DESCRIPTION
• Bring research and researchers closer to the public. • Promote excellent research projects. • Increase the interest of young people in science and research careers. • Showcase the impact of researchers' work on people's daily lives. • Reach out to students of all ages, all year round, with special programmes culminating during the Night 2024 and 2025. • Develop innovative engagement formats to actively involve students, researchers, and teachers nationwide.	Since 2013, SHARPER has organized the European Researchers' Night: a public event, which displays the diversity of science and its impact on citizens' daily lives in a fun, inspiring way. Born with a regional dimension, SHARPER now involves nine Italian regions and 15 cities. SHARPER stresses the need to be responsive through the active engagement of citizens and communities to obtain socially effective results through collective actions. SHARPER 2024-25 is focused on the researchers' efforts in the societal challenges of finding innovative solutions in the five mission areas, starting primarily from young generations but including all kinds of audiences. It is not only an opportunity for citizens' involvement and collective discovery, but also an example of how research communication is an act of responsibility, a commitment which underlines the cultural and political role that researchers and citizens together can and must play in social growth. ➔

OBJECTIVES	DESCRIPTION
To raise public awareness of science in an accessible and engaging way, and within a European context, as it is a date celebrated across Europe.	University of Palermo and Psiquadro, SHARPER Coordinator, have successfully collaborated in organizing SHARPER since 2016. UNIPA, as a partner of the project, contributes to the organization of events at the local level, involving both its departments and the network of research institutions and associations over the territory. It pays attention not only to the scientific research, but also to social sciences, to the research on cultural heritage and humanities, and makes use of different communication tools (entertainment, music, exhibits, experiments, walks, urban games, art & science).

RESULTS	REPRODUCIBILITY
SHARPER Palermo involves more than 600 researchers and attracts more than 5000 visitors of all ages each year. It has greatly contributed to the awareness of the population about the role that research has in everyone's life and, above all, in the territory, making them aware of the different research activities that are carried out. Inclusiveness in a knowledge-based society is the core feature of Sharper 2024-25, summarized by the following claim: "Researchers and citizens build an accessible future". Furthermore, during these editions, the event has contributed to improving the communication skills of researchers towards the public.	From 2013 onwards, SHARPER proved to be a transferable and replicable experience, covering different geographical and disciplinary areas, searching for synergies and contamination. Although its model is implemented in all the partner cities, it is adaptive to the distinctive features of the local urban and research environment.

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<http://www.sharper-night.it/sharper-palermo/> - <https://www.youtube.com/watch?v=VeLyfLBBCHA>

GREENVERSITY – Empowering Higher Education with Green Competences



UNIVERSITATEA
LUCIAN BLAGA
— DIN SIBIU —



SUMMARY: GREENVERSITY is a three-year Erasmus+ project (September 2024 – August 2027) focused on integrating the European Green Competence Framework (GreenComp) into higher education. Its mission is to equip universities, educators, and students with the knowledge, values, and skills needed to drive sustainable transformations in society by embedding green competences into curricula, training programs, and student-led initiatives across Europe.

AREA OF ACTION: Higher Education, Sustainability Education, Curriculum Innovation, Green Competences, Erasmus+ Strategic Partnerships.

OBJECTIVES	DESCRIPTION
• Integrate and implement the European Green Competence Framework (GreenComp) within higher education institutions. • Empower educators through innovative Training-of-Trainers (ToT) methodologies and digital resources. • Engage students with green competence courses and networking opportunities to upskill for a sustainable future. • Develop a scalable framework to integrate and certify green competences in higher education systems.	GREENVERSITY unites a multidisciplinary consortium across six European countries, led by the University of Valencia, with partners—including Lucian Blaga University of Sibiu—working collaboratively to mainstream sustainability in higher education. The project aims to standardize educational materials, elevate learning outcomes, align institutional practices with the EU sustainability agenda, and foster values and attitudes necessary for future green leadership. It will deliver digital training centers, comprehensive courses, educator toolkits, and a long-term roadmap for sustainability integration in universities.

RESULTS	REPRODUCIBILITY
• A strategic framework for implementing and certifying sustainability competences across European higher education institutions. • Training-of-Trainers programs and digital toolkits tailored for educators to effectively deliver green competence education. • Student-focused courses and networking platforms designed to enhance green skills and engagement. • Strengthened institutional collaboration and capacity-building among partner universities for sustainability education.	The project's scalable framework, open-access digital resources, and structured training methodologies make GREENVERSITY highly reproducible. Institutions across disciplines and countries can adapt and implement their outputs to align with GreenComp and local sustainability goals. The consortium's tools and roadmap encourage replication and systemic adoption of sustainability education.



Consortium Partners:

- University of Valencia (Spain) – Project Coordinator
- University of Jyväskylä (Finland)
- Université Bourgogne Europe (France)
- Agencia Valenciana de Evaluación y Prospectiva (Spain)
- F6S Network Ireland (Ireland)
- Lucian Blaga University of Sibiu (Romania)
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Researchers' Night



UNIVERSITATEA
LUCIAN BLAGA
— DIN SIBIU —

SUMMARY: The Researchers' Night project aims to connect researchers with the general public and highlight the impact of science on everyday life through workshops, conferences, experiments, exhibitions, and cultural activities. It primarily targets pupils and students but is open to citizens of all ages across Sibiu County and neighboring regions, including rural communities. The project fosters interest in science, technology, culture, and STEAM education, while also promoting Sibiu's cultural heritage and encouraging partnerships between academia, public institutions, businesses, and NGOs. Its activities strengthen ties between researchers and society, support career guidance, and encourage educational tourism.

AREA OF ACTION: Intersection of science, technology, engineering, arts, and mathematics (STEAM), while also promoting cultural heritage, sustainability, inclusion, and community engagement.

OBJECTIVES	DESCRIPTION
• Promote STEAM Education: Engage pupils, students, and the public in hands-on activities that stimulate interest in science, technology, engineering, arts, and mathematics. • Strengthening Public Engagement with Research: Bring researchers closer to society through interactive workshops, experiments, and demonstrations that showcase the impact of research on everyday life. • Promote Cultural Heritage: Highlight and preserve Sibiu County's rich cultural traditions through educational and artistic workshops.	The <i>Researchers' Night</i> project is an initiative designed to bridge the gap between the academic world and society by making science, technology, and research more accessible and engaging to the general public. Through a dynamic program of workshops, conferences, exhibitions, experiments, competitions, and cultural events, the project demonstrates the relevance and impact of research on everyday life, community development, and societal progress. The project emphasizes STEAM education (Science, Technology, Engineering, Arts, and Mathematics) as a driver of innovation, creativity, and critical thinking, offering pupils, students, and citizens opportunities to interact with researchers and participate in hands-on activities. At the same time, it highlights cultural heritage as an integral part of education and social identity, with dedicated workshops showcasing the richness of Sibiu County's traditions.

OBJECTIVES	DESCRIPTION
• Foster Partnerships and Collaboration: Strengthen cooperation between academia, public institutions, businesses, NGOs, and local communities to enhance research visibility and societal impact. • Encourage Youth Participation and Career Orientation: Motivate young people to consider careers in research and innovation while fostering volunteerism and civic involvement. • Advance Inclusivity and Equal Opportunities: Ensure equal access to activities for all participants, regardless of age, gender, social background, or physical ability. • Promote Environmental Responsibility: Implement sustainable practices by using recyclable materials, reducing waste, and raising awareness of environmental protection.	Beyond education and culture, the project fosters sustainability, inclusivity, and community engagement. Activities are designed to ensure equal access for all social groups, including youth from rural and small urban areas, while venues provide accessibility for people with disabilities. Environmental responsibility is promoted by exclusively using recyclable materials and implementing selective waste collection at all events. The initiative also strengthens partnerships between academia, local authorities, cultural institutions, businesses, and NGOs, creating a collaborative ecosystem that supports research visibility, educational tourism, and civic participation. By motivating young people to explore research careers, engage in volunteerism, and contribute to their communities, the project helps build a new generation that values science, culture, and sustainability. Ultimately, the Researchers' Night Project contributes to the broader goal of fostering a knowledge-based society, where research, education, culture, and innovation converge to support both local prosperity and European values.

RESULTS

The Researchers' Night Project has successfully increased young people's interest in research careers and strengthened the university's visibility in the community. By engaging pupils, students, and citizens in interactive workshops and experiments, the project inspired participants to acquire new skills and explore opportunities in science, culture, and technology. It also fostered civic engagement, motivating youth to volunteer and ensuring inclusivity by involving both urban and rural populations. At the same time, it stimulated appreciation for theater, visual arts, and Sibiu County's cultural heritage. Environmental responsibility was promoted through sustainable practices such as recyclable materials and selective waste collection, raising awareness of pollution prevention. Overall, the project created lasting partnerships, broadened community participation, and reinforced the role of research and culture in regional development.

REPRODUCIBILITY

The project can be easily replicated in other regions and institutions thanks to its flexible design and inclusive approach. Its reproducibility is ensured by:

- Modular activities (workshops, experiments, exhibitions, cultural events) are adaptable to different contexts.
- Partnership model involving academia, institutions, businesses, NGOs, and communities.
- Inclusivity through accessibility for diverse audiences, including rural areas and people with disabilities.
- Sustainability practices such as recyclable materials and selective waste collection.
- Scalability from small local initiatives to large public events.

This model allows other universities and communities to adopt and adapt the project, strengthening research visibility and public engagement.



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Horizon- BlueGreen Governance: Knowledge Transfer for Environmental Governance Innovation in Public Administrations



VNIVERSITAT
DE VALÈNCIA

SUMMARY: BlueGreen Governance is an EU Horizon Europe project in which the Universitat de València participates as a co-coordinator together with the University of Portsmouth. The project generates scientific knowledge on integrated land-sea coastal governance and promotes its effective transfer to public administrations responsible for coastal planning and management. The project partners want to contribute to: re-designing marine policies around the land-sea connection and easing the implementation of EU and national marine policies, and in the end, to the restoration of marine and coastal habitats, considering climate change and land-sea interactions. The Valencia Region acts as one of the pilot territories, given its high ecological value and institutional diversity, providing a robust testing ground for governance innovation.

AREA OF ACTION: Operational recommendations for governance, IP management, and regional policies; Engagement with non-academic stakeholders through co-creation and living labs.

OBJECTIVES	DESCRIPTION
To identify land-sea governance challenges through participatory diagnosis with key stakeholders; to develop operational tools and recommendations for Public Administrations; and to consolidate a co-creation-based knowledge transfer model replicable in other geographical and institutional contexts.	The initiative is structured around co-creation as the core methodology for knowledge transfer and governance. Researchers and academics, economic sectors, public administration, third-sector representatives, and other territorial actors collaborate in a continuous, bidirectional process. This has materialized in participatory workshops made by the University of Valencia at the Prat de Cabanes-Torreblanca, Albufera, Pego-Oliva, El Hondo, Santa Pola, Torrevieja, and La Mata coastal wetlands. Deliberative analysis, participatory mapping, and group dynamics were combined to generate operational recommendations, governing board modifications, mutual understanding agreements, and trust networks among actors who rarely share reflection and decision-making spaces.



RESULTS	REPRODUCIBILITY
Operational recommendations for regional and local administrations on interinstitutional coordination, integration of research results in coastal wetlands planning, and development of more effective public participation mechanisms. A consolidated network of researchers, public officials, and territorial actors, and a living lab model validated in the Valencia Region.	The co-creation model developed is designed to be replicable in other coastal European regions facing similar land-sea governance challenges. The methodology (combining participatory workshops, deliberative analysis, and trust-network building between academia and public institutions) is transferable to different territorial contexts. In the short term, recommendations are expected to feed into the València Region's Green Infrastructure Coastal Territorial Action Plan and coastal protected-area management plans.

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FORTHEM Hybrid Winter School Model: A Replicable Framework for Sustainable Academic Mobility



VNIVERSITAT
DE VALÈNCIA

SUMMARY: First launched at the University of Valencia in 2021, the FORTHEM Hybrid Cellular Signaling Winter School combines faculty mobility with distributed student participation across partner universities. This initiative delivers high-impact international academic interaction while reducing costs and environmental impact. Its successful adoption by multiple FORTHEM institutions demonstrates its sustainability, scalability, and value as a transferable model for European university alliances.

AREA OF ACTION: Training researchers in technology and knowledge transfer: curricula, micro-credentials, summer schools, industrial PhDs, TTO/KTO roles, mentoring, and impact assessment.

OBJECTIVES	DESCRIPTION
The <i>Cellular Signaling</i> Winter School aims to deepen understanding of the dynamic signalling processes that govern living cells while promoting academic integration across the FORTHEM Alliance through an innovative hybrid mobility model combining faculty exchange with distributed student participation. Its objectives are to broaden student access to specialised international training, strengthen inter-institutional scientific collaboration, foster active student engagement, and develop sustainable, inclusive, and scalable approaches to transnational higher education.	The Winter School is a two-day intensive academic programme hosted on-site by one partner institution. Faculty members from participating universities travel to the host institution to deliver specialised lectures and interactive sessions to local students attending in person, while students from the remaining partner universities participate synchronously online. The model was first implemented at the University of Valencia in 2021, engaging around 100 advanced students and contributing to its curricula. Following its successful pilot phase, subsequent editions have been hosted, confirming its operational robustness and institutional relevance.



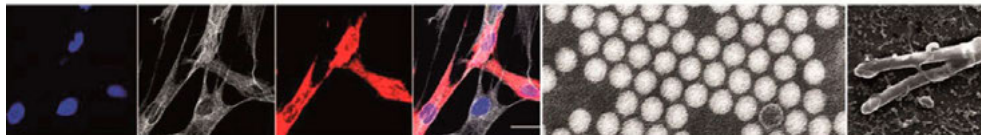
FORTHM Alliance Winter School
on **23-24 January, 2025** in **Jyväskylä, Finland**



CELLULAR SIGNALING

dynamic processes in living cells

REGISTRATION DEADLINE
for online participation
20th January



- All talks will be **available online**
- Students from all the universities of the Alliance will be able to join
- Participants will get a **certificate** for active participation
- **No participation fees!**



Scan the QR code
or follow this link to register:
tinyurl.com/mv5xmu64

forthem-alliance.eu

- **Two days - 4 Sessions**
- Each session will be given by a senior scientist complemented by a PhD student



Co-funded by
the European Union



RESULTS	REPRODUCIBILITY
The four editions organised to date have engaged hundreds of students, primarily at degree and master's level in the broad area of biological sciences, and have consistently received excellent evaluations, with overall satisfaction scores of 4.65/5 and organisational quality rated at 4.75/5 in the inaugural edition. Beyond these immediate outcomes, the model's strongest validation lies in its continued adoption across the alliance and its extension to additional academic disciplines.	The model has demonstrated its reproducibility through successful implementation at multiple FORTHEM institutions, including the University of Valencia (2021), Johannes Gutenberg University Mainz (2022), University of Bordeaux (2023), and University of Jyväskylä (2025), with future editions already scheduled. This continuity demonstrates that the framework does not depend on a specific host institution or disciplinary field, but on a simple and transferable operational design. Implementation requires coordinated academic planning, standard hybrid teaching infrastructure, and limited faculty mobility. By combining a hub-based teaching environment with distributed online participation, the model offers a scalable, cost-efficient, and low-carbon strategy for international academic collaboration across Europe.

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THEMATIC AREA 5:
**Engagement with non-academic
stakeholders (local SMEs
and other organizations) to exchange
topics of common interest:
co-creation, living labs, R&D contracts,
societal engagement,
and participation mechanisms**



Superbugs FORTHEM: Student Driven Antimicrobial Discovery and Public Engagement on Antimicrobial Resistance



VNIVERSITAT
DE VALÈNCIA

SUMMARY: Superbugs FORTHEM (SF) is an international initiative that brings together students and teachers from four FORTHEM universities to explore antimicrobial discovery through a blended intensive programme. Combining laboratory research, citizen-science (C-S), and service-learning (S-L), the project enhances microbiology education, increases awareness of antimicrobial resistance (AMR), and fosters cross-border collaboration. It also empowers students to design and implement similar initiatives within their own institutions and in schools at other levels.

AREA OF ACTION: Societal engagement, citizen science, and international collaborative training on AMR.

OBJECTIVES	DESCRIPTION
The programme aims to enhance students’ knowledge of microbiology and health, increase their awareness of antimicrobial resistance, and strengthen their communication and outreach skills. It also seeks to establish a sustainable transnational network focused on antimicrobial discovery and citizen science activities across FORTHEM universities, together with invited students from Ukrainian institutions. Additionally, the initiative contributes to advancing One Health education in the academic community and fostering public engagement.	SF is a blended intensive programme promoted by the University of València and jointly organized with those of Opole, Palermo, and Mainz. Regarding the core activity, participants take part in a virtual preparatory phase, a hands on laboratory week in València, and a final online evaluation. The programme includes soil sampling, microbial isolation, antibiotics assays, geolocation, keynote lectures, and visits to research facilities. By integrating S-L and C-S approaches, students investigate natural sources of antimicrobial compounds while reflecting on the social implications of AMR. Building on the success of previous FORTHEM actions, the project seeks to expand antimicrobial discovery activities throughout the alliance.

RESULTS

The programme has established a multidisciplinary international teaching network, providing students trained in antimicrobial discovery techniques and with increased awareness of AMR. It has also supported the development of C-S initiatives within partner universities, extending the impact of the original UV pilot project, involving up to 500-1,000 university and/or high school students each year.

REPRODUCIBILITY

The structure of the programme (virtual preparation, intensive laboratory week, and online follow up) makes it easily transferable to other universities. All protocols, teaching materials, and evaluation tools are openly shared among partners. The S-L and C-S components can be adapted to local contexts, enabling institutions to implement antimicrobial discovery activities in the academic environment with minimal infrastructure. The project's success across several universities demonstrates its scalability and potential to create educational ecosystems for innovation, and the long term goal is to extend the model to all FORTHM partners, fostering a network of student driven AMR awareness and antimicrobial discovery initiatives.



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Sports psychology as an improvement tool for the French national rugby teams



SUMMARY: UBE Researchers teamed up with the French Rugby Federation to develop a psychological training method that has demonstrated its efficiency in improving performance.

AREA OF ACTION: Co-creation with external stakeholders.

OBJECTIVES	DESCRIPTION
Provide scientific guidance in the development, structuring, and implementation of a performance model that places the mental aspect at the heart of rugby practices to improve the rugby teams' general performance.	UBE's sports psychology research lab, Psy-Drepi, and the French Rugby Federation (FFR) signed a cooperation agreement in 2019, which led to the creation of a sports psychology unit within the performance department of the federation. Researchers provided coaching staff with training on mental preparation for teams, as well as scientific oversight of performance projects. They also had one-on-one sessions with professional rugby players. Mental skills training now accounts for nearly 200 hours of teaching within the three-year training program at the federation's youth training centre. Courses include the development of emotional and leadership skills.

RESULTS	REPRODUCIBILITY
The practical recommendations derived from UBE's research benefit all French national rugby teams, men's and women's, as well as junior teams, leading to France winning gold in Men's Rugby 7s at the 2024 Olympics.	Psychology as a tool for teamwork improvement can be applied to a multitude of sectors and industries and is not limited to sports management.

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Engagement of Local SMEs and Non-Academic Partners at Johannes Gutenberg University Mainz (JGU)



JOHANNES GUTENBERG
UNIVERSITÄT MAINZ

SUMMARY: Johannes Gutenberg University Mainz actively fosters engagement with regional small and medium enterprises (SMEs) and non-academic partners through structured technology transfer, collaborative research projects, public science formats, and career engagement events. By combining knowledge transfer services, science communication initiatives, and career fairs, JGU strengthens university/industry cooperation and promotes direct exchange between researchers, businesses, and society.

AREA OF ACTION: Technology and knowledge transfer; University/industry cooperation; public science communication; career engagement.

OBJECTIVES	DESCRIPTION
The initiative aims to strengthen sustainable collaboration between JGU, regional SMEs, and other non-academic partners by providing structured technology transfer services, enabling joint research and innovation projects, and fostering dialogue through public engagement and career-oriented formats. It seeks to increase the societal relevance of academic research and support regional innovation ecosystems.	JGU's engagement with SMEs and non-academic partners is anchored in its GUTENBERG Innovate Unit. This unit provides support for contract research, intellectual property management, and information about industry partnerships. Complementing these services, public formats such as the annual Mainz Science Market make direct interaction between researchers, citizens, and regional actors possible. In addition, the university's Career Service organizes career fairs and networking events such as meet@uni-mainz, faculty-specific career days, and regional career formats that bring local employers onto campus. Together, these activities create multiple interfaces for knowledge exchange and long-term cooperation between science, business, and society. Finally, JGU's Center for Knowledge Transfer and Lifelong Learning places its focus on vocational education and training, continuing professional development, and cross-skilling and offers support and tailored training for companies.

RESULTS	REPRODUCIBILITY
The integrated approach has increased collaboration with regional enterprises, improved SME access to academic expertise, and strengthened public engagement with science. Career fairs and networking events facilitate direct contact between students, researchers, and employers, while technology transfer services enable targeted cooperation projects, contributing to regional innovation capacity and workforce development.	This strategy can be replicated by universities wanting to engage SMEs and non-academic partners more systematically. Key elements include a dedicated technology transfer office, accessible science communication formats (e.g., science markets), and career engagement activities such as campus-based career fairs and employer networking events. Embedding these measures within regional alliances and maintaining strong institutional commitment ensures continuity and visibility.

CONTACT / WEBSITE

JGU offers for companies: <https://www.fuer-unternehmen.uni-mainz.de/>



FORTHEM Lab project Water Governance and Digitalization: Climate, Societal and Political Challenges in the European Context



JOHANNES GUTENBERG
UNIVERSITÄT MAINZ

SUMMARY: While climate change changes precipitation patterns, digital tools are becoming essential for water management, introducing societal challenges. This project aimed to bring together researchers, students, and practitioners from multiple disciplines and regions across European countries and beyond, working on political, technical, and/or societal challenges related to water governance and digitalization in the context of climate change.

AREA OF ACTION: Non-academic engagement.

OBJECTIVES	DESCRIPTION
This project aimed to bring together researchers, students, and practitioners from multiple disciplines and regions across European countries and beyond, working on political, technical, and/or societal challenges related to water governance and digitalization in the context of climate change. Through the realisation of a workshop, the objective was to identify synergies for collaboration and potentially establish shared research goals.	The central activity of this project was a workshop held at the University of Valencia (Spain) on February 25-26, 2026. The event brought together 25 participants from Germany, Spain, France, Finland and Poland, including researchers, students and practitioners from 10 different academic and non-academic institutions, among them the FORTHEM universities in Mainz (Germany), Valencia (Spain), Opole (Poland) and Jyväskylä (Finland). In line with the project's objectives, participants presented their respective research agendas and actively engaged in discussions through several participatory settings, thereby contributing to the co-creation of the workshop content and the definition of potential shared research objectives.

RESULTS

The main discussions and outputs of the workshop were structured and shared to foster future networking activities and support dissemination within the FORTHEM community and beyond. The initiated network expressed interest in jointly applying for funding schemes aimed at fostering or consolidating collaborative networks, as well as in organising a follow-up workshop or networking event to further develop the connections established.

REPRODUCIBILITY

The project is highly transferable to other topics, teams, and disciplines, and could also be reproduced within the network already initiated. On the one hand, bringing together professionals from both academic and non-academic backgrounds, as well as from different disciplines, is an appropriate approach to addressing complex societal challenges and can therefore be valuable in a wide range of academic contexts. On the other hand, designing a workshop through participatory methodologies, with both its content and outputs co-created by participants, enhances engagement and ownership and can be successfully applied in many different contexts.



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The project was funded through the FORTHEM Lab Projects funding scheme. Additional funding was provided by the University of Valencia to cover travel and accommodation expenses for some participants.



UNIPA for Open Science



Università
degli Studi
di Palermo

SUMMARY: The University of Palermo has successfully adopted strategies to promote open access and open science through a devoted working group, tailored communication initiatives (such as the section on the Library System web portal), training and support services for junior and senior researchers, exchange of good practices, and useful tools for authors and users.

AREA OF ACTION: Open Science.

OBJECTIVES	DESCRIPTION
• Promoting the principles of open access and open science. • Enhancing knowledge of related good practices, social and legal foundations, and institutional duties. • Supporting authors in open science-oriented research activities. • Training and updating of librarians and users. • Monitoring of the correct procedures for the free consultation of the products stored in the UniPa Institutional Research Information System (IRIS). • Creating useful tools for authors and users in general.	In 2004, UNIPA subscribed to the “Declaration of Messina”, supporting the “Berlin Declaration on Open Access to Knowledge in the Sciences and Humanities”, to engage new strategies for the dissemination of research through the internet. Then, in 2009, the University established its first institutional repository of research results, including Ph.D. dissertations. UNIPA confirmed its commitment to open access by signing the 2014-2018 Road Map together with numerous other universities and research institutions, which provided some priority lines of action for the development of institutional policies in Italy. In 2015, the University established IRIS - Institutional Research Information System - which is aimed at storing, searching, and enhancing research results. This repository is connected with LoginMIUR, the storage of the Italian Ministry of University and Research, so authors can upload their products on both platforms at once.

DESCRIPTION

Further initiatives included the establishment of a working group to manage the repository and open access, and the participation of UNIPA in AISA (Italian Association of Open Science) as an institutional member. Moreover, from 2020, thanks to a partnership with CARE-CRUI, authors within UNIPA can publish, with some editors, their articles in open access, without paying the APC (Article Processing Charge).

Finally, in 2022, a specific section of the website that disseminates the main contents of open access was published (which renews and expands the previous one dedicated to open access).

UNIPA also promotes open access through specific events, disseminating good practices, and creating useful tools for authors and users.

RESULTS

141.796 publications in the institutional repository: 40.662 open and 106 “embargo” (data updated as of December 2024).

Source: <https://www.unipa.it/biblioteche/fare-ricerca/archivio-istituzionale-ricerca/>

REPRODUCIBILITY

The actions promoted by the “Offices providing research support” within the Library System and Historical Archive Service at UNIPA helped to overcome the concerns of researchers on the quality of open access publications, on the degree of protectability of intellectual products made available in open mode and, above all, on the potential of Open Access products for bibliometric purposes and for increasing the visibility of the research teams concerned.

Moreover, the “Offices providing research support” are working on replicable activities to increase the awareness of the academic community on the importance of Open Science to engage citizens and show the potential of an open approach to science communication.

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Centrum Radiomonitoringu i Pomiarów Promieniotwórczości (CRiPP)



SUMMARY: CRIPP is a specialised research and service unit of the University of Opole focused on radiomonitoring, radioactivity measurements, environmental safety, and scientific support related to ionising radiation. The centre conducts research, measurements, expert analyses, training, and public outreach activities in cooperation with academic institutions, public administration, and industry.

AREA OF ACTION: Environmental monitoring, radiological measurements, radiation protection, laboratory services, scientific research, education, and public dissemination of knowledge related to radioactivity and environmental safety.

OBJECTIVES	DESCRIPTION
• Conduct high-quality radiomonitoring and radioactivity measurements. • Conduct research into the concentration of radon in indoor air and soil gas. • Support scientific research and environmental protection activities. • Provide expert services and laboratory analyses for external stakeholders. • Promote public awareness of radiation safety and environmental monitoring. • Develop cooperation between academia, industry, and public institutions. • Strengthen education and training in the field of environmental engineering and radiation measurements.	The Center for Radiomonitoring and Radioactivity Measurements (CRIPP) was established within the University of Opole as a research and expert unit dedicated to environmental radioactivity monitoring and radiation measurement services. The Center conducts laboratory analyses, environmental measurements, and scientific research related to ionising radiation and environmental protection. CRIPP also supports educational and outreach initiatives, organises specialised training activities, and cooperates with external institutions and businesses. The unit contributes to the development of scientific infrastructure and regional expertise in the field of environmental safety and radiological monitoring.

RESULTS	REPRODUCIBILITY
• Strengthened regional capacity in environmental radiomonitoring and radiation measurement. • Increased cooperation between the university, public institutions, and industry partners. • Development of scientific expertise and laboratory infrastructure in the field of radiomonitoring. • Support for environmental protection and radiation safety initiatives. • Educational and outreach activities increasing public awareness of radiological issues. • Contribution to research and innovation in environmental monitoring.	The CRIPP model can be adapted by other universities and research institutions seeking to combine scientific research, specialised laboratory services, and public outreach activities around environmental monitoring and radiation safety.



Opole Science Festival



SUMMARY: The Opole Science Festival is an interdisciplinary open-science outreach initiative coordinated by the University of Opole, bringing together academic, educational, cultural, business, and civic partners. The festival offers more than 300 lectures, workshops, shows, and public events, culminating in the Night of Science and the Opole Science Picnic. It reaches several thousand participants both on-site and online and is one of Poland's longest-running regional science popularization programmes.

AREA OF ACTION: The festival covers the full spectrum of disciplines, including exact and natural sciences, technical and medical sciences, social sciences, humanities, and the arts.

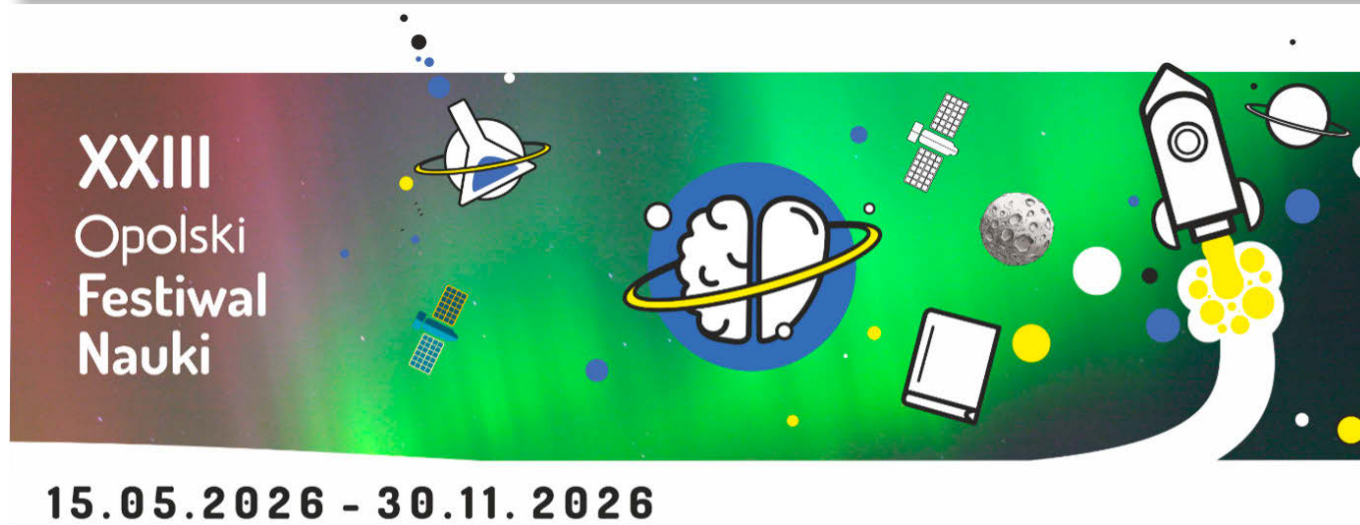
OBJECTIVES	DESCRIPTION
• Popularise scientific research and its applications among the public. • Strengthen scientific literacy, curiosity, and civic competencies, especially among young people. • Foster cooperation between universities, schools, research institutes, cultural institutions, and industry. • Promote equal access to knowledge through free, inclusive, and accessible events. • Inspire students to pursue scientific and technical careers. • Support socially responsible science.	The Opole Science Festival is a major public science initiative running for several months each year. It features lectures, workshops, exhibitions, competitions, and outdoor events delivered by researchers, educators, students, and international guests. It is an annual educational and social event organised by the University of Opole since 2002, in cooperation with the Opole Academic Consortium, local government, and business partners. The project implements the idea of open science, offering free access to knowledge and actively engaging the community in research and educational activities. Activities span STEM disciplines, the humanities, the social sciences, and the arts. Key flagship events include: • Night of Science – 12 thematic zones, 60 activities, a laser show, lectures, demonstrations, and a meeting with well-known researchers. • Opole Science Picnic – a large open-air event with 45 scientific stands, debates, demonstrations, historical reconstructions, artistic performances, and hands-on workshops in the city centre.

RESULTS

- Increased visibility of science and the university in the region and sustained public engagement.
- Strengthened cooperation between academia, schools, business, and public institutions.
- Improved accessibility of science through inclusive and multilingual events.
- Development of new educational resources and outreach formats for schools and teachers.
- Strengthening the university's role as a regional hub for innovation, culture, and public dialogue.
- Approximately 10,000 participants.
- Over 300 scientific and educational events delivered across disciplines.

REPRODUCIBILITY

The festival provides a transferable model of public engagement with science that can be adapted by other regions seeking to strengthen scientific literacy, community participation, and cooperation between science and society.



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THEMATIC AREA 6:

Examining how artificial intelligence is transforming and enhancing the processes of knowledge transfer from universities to the business sector and society, including opportunities, challenges, and implications for innovation, collaboration, and societal impact



AI at JGU – Implementing, cooperating, developing



JOHANNES GUTENBERG
UNIVERSITÄT MAINZ

SUMMARY: Johannes Gutenberg University Mainz (JGU) is implementing a JGU-led FORTHEM WP7 initiative on “AI transforming Knowledge Transfer.” Building on JGU’s AI ecosystem and transfer expertise, we conduct a cross-partner survey to map current AI-enabled transfer practices, identify transformation mechanisms, and derive actionable recommendations. The results directly feed into the new Book of Good Practices.

AREA OF ACTION: Artificial Intelligence; Digital Knowledge Transfer; Research and Innovation; Interdisciplinary Collaboration; FORTHEM Best Practices.

OBJECTIVES	DESCRIPTION
The JGU-led project aims to establish an evidence-based overview of how AI is already used (and envisioned) in knowledge transfer across FORTHEM universities. We seek to cluster practices and needs, identify concrete options for university leadership, and translate findings into publishable best-practice examples and recommendations for the WP7 Book of Good Practices.	In this JGU-led contribution to the WP7 Book of Good Practices, we run a FORTHEM-wide survey to capture how AI is currently used in knowledge-transfer activities and what partners see as the next steps. The questionnaire distinguishes between current practice and future vision, collects concrete use cases, tools, support structures, and governance models, and identifies barriers and enabling factors for AI-enabled transfer. Survey results are synthesised into clusters and actionable transformation mechanisms, complemented by selected partner examples. Outputs include a concise analytical summary, visuals/infographics, and publication-ready text blocks feeding directly into the Book of Good Practices and related recommendations.

RESULTS	REPRODUCIBILITY
The initiative delivers a structured, comparable mapping of AI-enabled knowledge transfer across FORTHEM, highlighting what works, where capacity gaps exist, and which mechanisms accelerate transfer. It provides direct input for strategy and support measures and generates validated, publication-ready best-practice content for WP7, grounded in partner data rather than anecdotal evidence.	This approach is replicable for university alliances that want to operationalise AI in knowledge transfer. Key elements are: a clear lead and governance, a lightweight but focused coordination setup, a survey design that distinguishes practice vs. vision, and an explicit pipeline from evidence to publishable outputs (clusters, mechanisms, examples, recommendations). Treating AI as a structural enabler of transfer, embedded in workflows and partnerships, helps turn insights into sustainable institutional action.

CONTACT / WEBSITE

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<https://www.digitale-methodik.uni-mainz.de/>
<https://www.ki-allianz-rlp.de/>

Integration of Artificial Intelligence in Research Activities at ULBS



UNIVERSITATEA
LUCIAN BLAGA
— DIN SIBIU —

SUMMARY: The project strengthened the digital and AI competencies of 240 faculty members and doctoral students, enhancing the quality, efficiency, and competitiveness of research. Through 48 specialized workshops on AI technologies, ethics, data security, and project development, participants gained practical skills to optimize data analysis, automate processes, and design impactful research proposals. The initiative promoted interdisciplinary collaboration, responsible AI use, and industry partnerships, while providing access to advanced tools and infrastructure. The project boosted scientific output, improved success in securing national and international research funding, and consolidated ULBS's position as a hub of research excellence.

AREA OF ACTION: Development of institutional capacity for research in universities.

OBJECTIVES

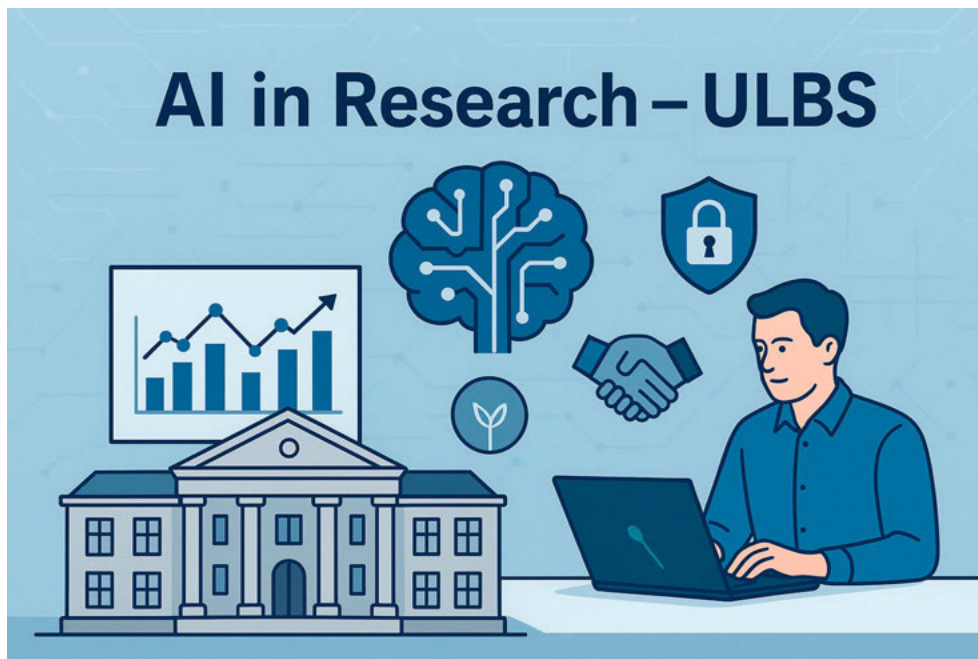
The general objective of the project was to train and improve the digital competencies of ULBS faculty and doctoral students, enabling them to use AI technologies efficiently and innovatively in research. This initiative aimed to increase research potential and establish research centers of excellence.

Specific Objectives:

- OS.1. Improved the quality of scientific articles produced by ULBS faculty and doctoral students through training workshops focused on developing competencies in AI technologies.
- OS.2. Provided training modules and workshops on the ethical and social aspects of AI in research, while promoting transparency and responsibility in the development and application of AI solutions.

OBJECTIVES

- OS.3. Increased the quality of research projects proposed by ULBS for national and international competitions by organizing workshops with internationally recognized experts from Romania and abroad.
- OS.4. Promoted collaboration among researchers from different fields and specializations to encourage knowledge and expertise sharing in the use of AI in research.
- OS.5. Provided access to AI tools, platforms, and resources—such as datasets, machine learning frameworks, and computing infrastructure—enabling researchers to experiment with and integrate AI solutions into their projects.



DESCRIPTION

The project addressed the growing need to adapt academic research to the digital transformation era. Recognizing that Artificial Intelligence offers new opportunities for data analysis, experiment optimization, and knowledge discovery, the project aimed to prepare ULBS faculty and doctoral students to incorporate these technologies into their scientific work.

To achieve this, the project established a structured training and support framework. A carefully selected group of 240 participants engaged in targeted workshops that combined theoretical understanding with hands-on practice. These workshops introduced state-of-the-art AI tools, explored emerging applications such as conversational AI platforms, and created opportunities for participants to apply methods directly to their own research topics. Complementary sessions addressed the ethical, social, and security challenges of AI, ensuring that participants not only developed technical expertise but also learned to approach AI integration responsibly.

The project also facilitated collaboration across disciplines and with external stakeholders. By inviting international experts and organizing events with industry partners, the initiative positioned ULBS as both a knowledge hub and a bridge between academia and the socio-economic environment. Access to infrastructure, datasets, and specialized software created an environment where experimentation and innovation could thrive.

Beyond its direct outcomes, the project strengthened ULBS's institutional capacity for research by cultivating a culture of digital innovation, enhancing academic visibility, and laying the groundwork for sustainable, AI-driven research excellence.

RESULTS

The project fostered interdisciplinary collaboration, promoted responsible and secure research practices, and strengthened ties with the economic sector through dedicated partnership workshops. As a result, the project improved the quality of scientific publications, increased ULBS's competitiveness in securing research funding, and consolidated its position as a hub of research excellence at national and international levels.

REPRODUCIBILITY

The project developed a structured and scalable training model that can be replicated both within ULBS and in other academic contexts. Standardized workshops, documented methodologies, and the use of existing infrastructure ensured that activities could be reproduced, adapted, and sustained beyond the project's duration.



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AI Framework for Human-Inspired Adaptive Robotic Welding



SUMMARY: This project demonstrates a transferable model of research–industry collaboration through an industrial PhD scheme (CIFRE – Industrial Convention for Training through Research, a French national co-funded doctoral programme). Combining artificial intelligence, robotics, and multi-modal perception, it enables real-time adaptive robotic welding while providing a scalable framework for accelerating knowledge transfer across European university–industry ecosystems, contributing to industrial competitiveness and technological sovereignty.

AREA OF ACTION: Artificial Intelligence for industrial robotics – knowledge transfer – industrial PhD – European innovation ecosystems – smart manufacturing.

OBJECTIVES	DESCRIPTION
The objective is twofold: (1) develop an AI-driven framework enabling robotic systems to replicate human adaptive behavior in complex industrial processes, and (2) establish a structured and replicable model for transferring advanced academic research into industry through long-term collaboration based on co-funded industrial PhD programmes.	The project introduces a full perception–decision–action architecture for robotic welding. A dual-modality sensing system combines a laser profilometer and a weld pool camera to construct a perception matrix Ω . From this, a feature vector ψ is extracted using hybrid approaches combining geometry, deep learning, and knowledge distillation (including foundation models). A neuro-fuzzy system (ANFIS) maps ψ to control parameters λ , enabling adaptive and explainable process control. Implemented within a co-funded industrial PhD framework, the project ensures continuous interaction between academic research and industrial needs, with validation in real production environments.

RESULTS

The system was validated in operational industrial conditions, achieving defect-free welds confirmed by non-destructive and destructive testing. The project reached TRL 6–7 and resulted in several scientific publications in international venues, as well as industrial recognition, including an innovation award. It demonstrates the effectiveness of combining AI with domain expertise in real production systems.

REPRODUCIBILITY

This good practice is transferable to other European universities and industrial sectors. Its reproducibility relies on three pillars: (1) a modular AI-based architecture, (2) accessible industrial sensing technologies, and (3) a structured industrial PhD framework enabling sustained academia–industry collaboration. The structured pipeline ($\Omega \rightarrow \psi \rightarrow \phi \rightarrow \lambda$) can be adapted to other robotic applications. However, replication requires institutional support, access to industrial data, and integration of domain expertise. This highlights the importance of European policies supporting co-funded doctoral programs and long-term partnerships between universities and industry.



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Interdisciplinary AI Hub



SUMMARY: Université Bourgogne Europe's Interdisciplinary AI Hub aims to foster AI-related research and co-creation across all disciplines.

AREA OF ACTION: Artificial intelligence.

OBJECTIVES	DESCRIPTION
Create synergies across all research units working on AI-related topics to foster cross-disciplinary research and encourage joint call applications.	The Interdisciplinary Artificial Intelligence (AI) Hub at the Université Bourgogne Europe is dedicated to encouraging cooperation across all AI-related curricula and research conducted within the institution. The AI Hub is built on a structured governance framework that combines scientific expertise, educational coordination, and collaboration with socio-economic stakeholders. It brings together over 250 researchers across 28 research units. The Hub is structured around four main research themes (but not limited to): • Knowledge of the future: AI theories and development. • One Health. • Cultural heritage and social sciences. • Smart transition: STEM and environmental science. Thematic conferences and workshops are organized monthly.

RESULTS	REPRODUCIBILITY
The seminars and conferences organized by the Interdisciplinary AI Hub boost the evolution of practices and scientific focuses to keep abreast of AI innovation across all disciplines. Researchers develop a better understanding of other labs and researchers' competencies and AI approaches and can therefore better plan their applications to AI-related calls.	Organizing cross-disciplinary workshops and seminars centred around the topic of AI.



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IAtecUV – High Technology Incubator in Artificial Intelligence and Digital Enabling Technologies



VNIVERSITAT
DE VALÈNCIA

SUMMARY: IAtecUV is a strategic incubator of the Parc Científic de la Universitat de València (PCUV) focused on AI and Digital Enabling Technologies. It supports early-stage, research-connected start-ups with tailored mentoring, access to scientific-technological infrastructure and university capabilities, and links to leading corporates. The first call attracted 34 applications; 9 projects joined the incubator, spanning sectors such as health, legal tech, tourism, accessibility, sports, and precision agriculture.

AREA OF ACTION: Knowledge transfer, incubation/acceleration, university–industry collaboration, AI-enabled innovation.

OBJECTIVES	DESCRIPTION
To create and consolidate AI/DET-based start-ups connected to Universitat de València capabilities; provide a tailored incubation pathway; connect teams with research groups, infrastructure, and institutional resources; foster collaboration with anchor companies and ecosystem partners; and position PCUV as a specialised node for advanced digital technologies.	IAtecUV combines structured business and technology mentoring with access to university assets: expert guidance, diagnostic and personalised roadmap, links to research groups and scientific-technological infrastructure, and community-building activities with corporates, investors, and public actors. In 2025, the programme was launched and its first cohort selected through an open call and evaluation process. The incubator has also prepared an intensive Bootcamp to start the 2026 itinerary and a start-up presentation day, covering strategy, market, data governance, infrastructure, funding, and scaling.

RESULTS	REPRODUCIBILITY
During the first operational year, IAtecUV completed its launch and selection process. The 2025 call received 34 applications; 18 proposals were pre-selected, and 9 were finally incorporated. The selected projects showed strong sectoral diversity and demonstrated the applicability of AI to real market needs. IAtecUV also formalised collaboration with four anchor companies, strengthening applied mentoring and pathways for pilots and partnerships.	The model is designed to be replicable by other universities and science parks: a clear call-and-selection mechanism, standardised onboarding documentation, diagnosis and roadmap templates, and a service catalogue combining business support with access to research infrastructure. Replication requires (1) a coordinating unit, (2) access to university labs/experts, (3) an external mentor pool, and (4) at least one anchor-company scheme. The approach is modular, so institutions can start with selection + mentoring and progressively add bootcamps, corporate challenges, and international links.



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Inteligencia Artificial y Tecnologías
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Prazo aberto hasta **15 noviembre 2025 14:00 GMT+1**

INCUBACIÓN de **PROYECTOS y STARTUPS**
de **INTELIGENCIA ARTIFICIAL y**
TECNOLOGÍAS HABILIDADORAS DIGITALES



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Intelligent Translation: Limits, Challenges, and Issues in the Literary Field



VNIVERSITAT
DE VALÈNCIA



SUMMARY: This project explores the integration of artificial intelligence tools (Google Translate, Mistral, Claude, LaraTranslate, DeepSeek) in literary translation within a university course. Through collaborative activities, students compare AI-generated translations, identifying issues such as loss of stylistic nuance, cultural misinterpretation, bias, and ethical risks. The initiative highlights the limits of automation in relation to human expertise while promoting critical, responsible, and reflective use of AI tools.

AREA OF ACTION: Higher education, AI in education, literary translation, digital skills development, and knowledge transfer.

OBJECTIVES	DESCRIPTION
The project aims to develop students' critical thinking regarding AI tools, improve their understanding of literary translation challenges, and identify biases and limitations in automated systems. It also seeks to strengthen analytical, communicative, and collaborative skills while raising awareness of ethical implications and preparing students to present their findings in academic contexts. a) To develop critical thinking towards machine translation tools. b) To understand the specificities and challenges of literary translation.	The project is implemented in a university course (Literature and Culture in French 1, code 35686) within the Degree in Modern Languages and their Literatures (University of Valencia, Spain), with 32 enrolled students. It combines in-class sessions with autonomous collaborative work. Students, working in small groups, analyze selected excerpts from literary works and compare translations generated by different AI tools. Using structured analytical frameworks, they identify key challenges, including lexical and grammatical inaccuracies, syntactic ambiguities, and literal translations of idiomatic expressions; stylistic issues such as loss of tone, register, and literary effects; cultural and contextual misinterpretations; and ethical concerns, including bias, representation issues, and lack of inclusivity (https://go.uv.es/UFpk939).

OBJECTIVES	DESCRIPTION
c) To identify the biases or limitations of artificial intelligence in understanding literary language and cultural context. d) To raise awareness of the ethical and aesthetic challenges of AI-generated translation. e) To strengthen textual and comparative analysis skills. f) To prepare students to present and communicate their projects at academic innovation and experimentation events.	The process includes guided discussions, completion of analytical reports, and the production of a final reflective essay. Results are presented in an academic event (1st Conference on Innovation and Experimentation in AI: Co-creating with Students, https://ir.uv.es/HV0zDxa), reinforcing communication skills. The methodology integrates collaborative learning, critical analysis, and the responsible use of AI technologies. The process includes guided discussions, completion of analytical reports, and the production of a final reflective essay. Results are presented at an academic event, reinforcing communication skills. The methodology integrates collaborative learning, critical analysis, and responsible use of AI technologies.

RESULTS	REPRODUCIBILITY
The results indicate a generally positive perception of AI as a learning support tool. Students reported improvements in autonomy, critical thinking, and creativity, while also improving writing and analytical skills. However, challenges remain in areas such as ethical collaboration and proper citation practices. Faculty evaluations confirmed improvements in coherence, originality, and overall academic performance.	The project is transferable to other educational contexts, particularly in language, humanities, or translation programs. It requires access to AI tools, literary materials, and a structured methodology based on collaborative and critical learning. The model can be adapted to different academic levels and disciplines by modifying texts, tools, or assessment criteria. Its reproducibility relies on clear pedagogical design, the use of analytical templates, and evaluation rubrics. Also, integrating ethical reflection ensures responsible AI use, making the approach relevant for broader educational innovation and digital competence development.

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Tourist Start-up: What if your company adopted AI?



VNIVERSITAT
DE VALÈNCIA

SUMMARY: This project explores the integration of artificial intelligence tools in Tourism communication within a university course taught in French. Students act as managers of a fictitious start-up, testing and evaluating generative AI tools to decide how to improve customer service operations. Throughout the project, students assess both the potential benefits and limitations of these technologies, linking academic learning with real-world professional challenges. The project was implemented within the Degree in Tourism during the 2024-2025 academic year. Project materials: <https://go.uv.es/7g2FdxK>.

AREA OF ACTION: Higher education, AI in education, tourism communication, foreign language teaching, digital skills development, project-based learning, and ethical use of AI.

OBJECTIVES	DESCRIPTION
The project aims to develop students' critical thinking regarding the use of AI tools in the tourism sector and to promote their understanding of the communicative, cultural, and ethical challenges associated with their application in professional contexts. It also focuses on identifying biases and limitations in automated systems, as well as exploring how AI can support customer service processes.	The project is implemented in a university course (Comunicación en segunda lengua extranjera para turismo III, code 35125) within the Degree in Tourism at the University of Valencia (Spain), with 39 enrolled students. It combines 8 sessions (11 hours 15 minutes total) of in-class and autonomous collaborative work conducted in French as the language of communication. Students, working in small groups, assume the role of managers of a fictitious tourism start-up and design a business project integrating AI solutions across at least 6 key operational areas. Using Bloom's Taxonomy as a structured analytical framework, they progress from lower-order skills (remembering, understanding) to higher-order competencies (applying, analysing, evaluating, creating). Activities include guided experimentation with AI tools for text generation, automatic translation (Google Translate, DeepL, Sonix, MemoQ), image creation (DALL-E, Canva), and chatbot design; critical comparison of AI-generated versus human-produced content; cross-group peer evaluation sessions with structured rubrics; and production of a final audiovisual product (video or podcast, maximum 3 minutes) summarising key learnings.



RESULTS	REPRODUCIBILITY
Students successfully designed and presented fictitious tourism start-ups integrating AI solutions across multiple operational areas (communication management, marketing content generation, workflow automation, etc.), demonstrating the ability to apply higher-order thinking skills as defined by Bloom's Taxonomy. The project developed professional decision-making competencies, as students were required to evaluate AI tools not only from a technical perspective but also from a business and ethical one.	The project is transferable to other educational contexts, particularly in business administration, economics, management, or other technical and applied disciplines. It can be adapted to different academic levels and fields by modifying the professional sector, the target language, the AI tools employed, or the assessment criteria. Its reproducibility is supported by a clear pedagogical design, structured work templates, co-evaluation rubrics, and validated assessment instruments (EIIHA-E and IEHCT-IA scales). Integrating Bloom's Taxonomy and ethical reflection ensures responsible and informed AI use, making the approach suitable for the development of digital and professional competencies in business-oriented environments.

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Writing and Speaking with AI: Who Influences Whom?



VNIVERSITAT
ID VALÈNCIA



SUMMARY: This project explores the integration of AI tools (ChatGPT, Perplexity, Claude, Mistral, Gemini, etc.) in French language learning within a university course (French 4, code 35673) in the Degree in Modern Languages and their Literatures at the University of Valencia, where 35 students are enrolled. Students engage with generative AI tools to produce, compare, and analyse texts, exploring whether constant interaction with these systems shapes the way we write and speak. The project promotes analytical rigour, ethical awareness, and a reflective approach to AI-assisted communication. Project materials are publicly available: <https://go.uv.es/Wi5qqLM>.

AREA OF ACTION: Higher education, AI in education, language learning, digital skills development, academic integrity, and critical thinking.

OBJECTIVES

This project aims to explore how AI influences both text production and human oral expression, and to analyse the extent to which constant interaction with AI tools can modify the way we communicate. It also seeks to promote reflection on the limits between human creativity and automated language generation, and to evaluate whether AI tends to standardise language or, on the contrary, diversify it. Beyond these linguistic dimensions, the project is designed to develop students' critical thinking and collaborative skills through the comparative analysis of AI-generated and human-written texts, while raising awareness of the ethical implications of AI use in academic contexts (in relation to academic integrity and proper citation practices).

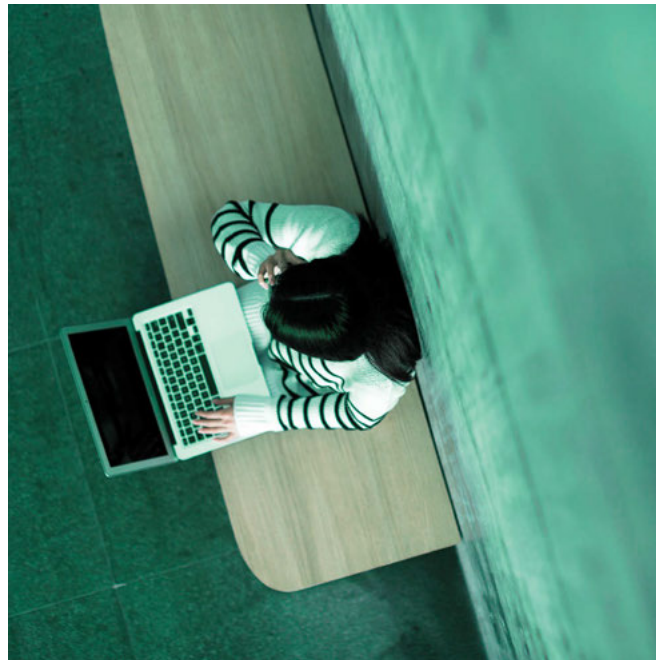
DESCRIPTION

The project runs over 9 sessions (approx. 14 hours) between February and May 2025. It combines in-class and autonomous collaborative work. Students work in groups of three following an action-research approach focused on critical language analysis.

DESCRIPTION

The project is structured in three phases: i) an initial questionnaire on students' prior experience and perceptions of AI; ii) the creation of two AI-generated texts and one human-written text (~1,000 words each) responding to "How can AI help in learning a foreign language?", followed by comparative analysis using templates to examine style, structure, coherence and originality; and iii) the design and implementation of an original activity exploring AI's impact on oral or written language (e.g., stylometry tasks, blind-reading games, or dialect variation analysis). The methodology includes guided discussions, a collaborative group journal (Journal de travail du groupe), peer assessment, and participation in an online lecture series on AI and academic integrity ("Más allá de la IA"). Results are presented at the 1st Conference on Innovation and Experimentation in AI (<https://ir.uv.es/HV0zDxa>) at the University of Valencia, strengthening oral communication skills.

Among the competencies addressed are students' critical thinking (algorithmic bias awareness), self-awareness (digital footprint reflection), anticipation (future AI scenarios), and collaboration (cooperative problem-solving with AI tools).



RESULTS	REPRODUCIBILITY
The experience suggests that AI is perceived as a useful but ambivalent tool for language learning and text production. Students generally reported that AI helped them improve fluency, organisation, and idea generation, particularly when drafting and structuring written texts. Many also highlighted its usefulness as a support for vocabulary expansion and revision, as well as for reducing the initial “block” when starting to write. However, results also point to a growing awareness of potential risks. Students noted a tendency towards homogenisation of style and reduced linguistic originality when relying on AI-generated outputs. In oral-related tasks, they observed that AI interaction may influence formulation patterns and discourse organisation, sometimes making expressions more standardised or less distinctive. From a reflective perspective, participants reported increased sensitivity to issues of academic integrity, especially regarding authorship, transparency, and citation practices when using AI tools. The activities also encouraged students to question the boundaries between assistance and dependence, fostering a more critical stance towards automated language generation.	The project is transferable to other educational contexts, particularly in language, humanities, or translation programmes. It requires access to AI generative tools, a structured action-research methodology, and collaborative learning platforms. The model can be adapted to different academic levels and disciplines by modifying text topics, tools, or assessment criteria. Its reproducibility relies on clear pedagogical design, analytical templates, evaluation rubrics (EIIHA-E and IE-HCT-IA scales), and the integration of ethical reflection on AI use.



SUMMARY: *Simply* is a role-based simulation platform that brings real-world social, economic, and political situations into the classroom. Each student takes on a distinct role with their own goals and information, sparking structured, curriculum-aligned discussions that build argumentation, critical thinking, and collaboration skills. Students join simulations directly from their smartphones, accessing their roles and scenario details in real time. At the same time, an AI assistant guides the discussion, and teachers receive analytics to track participation and assess skill development – all aligned with Latvia's updated competency-based curriculum.

AREA OF ACTION: Education technology.

OBJECTIVES

This project aims to build an innovative simulation game platform that helps students and other users develop a deeper understanding of social, economic, political, and other real-world processes, while enhancing argumentation, collaboration, and decision-making skills. Users take part in interactive simulations based on real societal processes, accessible through any smart device.

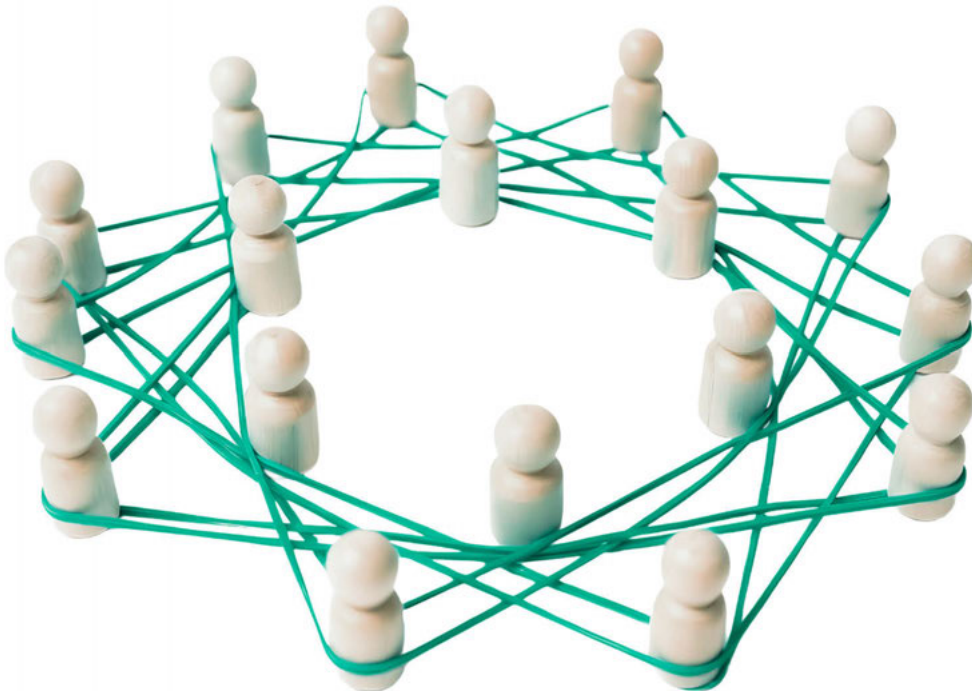
DESCRIPTION

Simply is a digital simulation game platform where participants engage in interactive, real-situation-based simulations. Each participant receives a specific role with defined goals, interests, and information, which encourages them to actively participate in a structured and purposeful discussion with other participants. In this kind of environment, participants gain hands-on experience with decision-making processes, conflicts of interest, and the search for compromise.

DESCRIPTION

The platform provides detailed scenario descriptions, tasks, and AI assistant support that help participants navigate the situation, offer additional information, and sustain the momentum of the discussion. Importantly for schools, teachers are given analytical tools that allow them to track the progress of a discussion, analyze student participation, and more easily assess argumentation, collaboration, and critical thinking skills.

Another key advantage of the platform will be the ability for users to create and publish their own simulation scenarios, which will be made available to other users. This will help build a shared library of learning materials aligned with the updated curriculum, usable across various subjects such as social studies, economics, and English, while also allowing users to explore as broad a range of topics as possible. This approach makes the learning process practical, interactive, collaboration-based, and much easier to assess, while also making discussions more structured, engaging, and considerably longer.



RESULTS	REPRODUCIBILITY
<i>Simplcy</i> addresses a critical gap in Latvian education by transforming abstract social, economic, and political processes into practical, experiential learning. Through role-based simulations, students develop argumentation, critical thinking, and collaboration skills that traditional theoretical teaching cannot provide. Teachers gain analytical tools to track participation and assess competencies objectively, while shared curriculum-aligned scenarios reduce their preparation workload. Beyond classrooms, <i>Simplcy</i> fosters civic engagement by giving people a structured, low-stakes way to explore divisive topics together, turning conversations that usually stall into longer, more meaningful, and genuinely productive discussions.	Thus far, we have built an MVP (minimum viable product) that has been tested in real-world classrooms and university lectures. These tests have proven the concept, and we see the potential for future development of our platform and how it could shape the future of discussions in education.

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We want to thank all authors, technicians, scholars, and collaborators for their hard work and determined efforts toward the completion of this collection. We desire that this collaboration will grow in intensity and extend to other areas within our common goal of improving our academic, research, and social links for the most successful future of the FORTHEM Alliance and European values.

FROM RESEARCH TO IMPACT

FORTHEM Alliance Good Practices

Shaping a European University with Global Outlook



This collective volume gathers, analyzes, and shares **best practices identified across nine partner universities from FORTHEM Alliance** in the fields of knowledge transfer, university–industry collaboration, and high-impact entrepreneurship. The book seeks to offer a comparative perspective, with evidence-based insights and operational recommendations, useful for both the academic community and institutional decision-makers and innovation ecosystem stakeholders.

From Research to Impact. FORTHEM Alliance Good Practices Shaping a European University with Global Outlook also aims to complement and update the initial work on these subjects, considering the **latest trends in research, communication, knowledge transfer, and entrepreneurship, particularly in light of the transformative impact of artificial intelligence**. A book with two distinct parts is proposed: the first dedicated to academic reflection, and the second focusing on all the good practices which can be compiled.

This work is aligned with the activities of the FORTHEM Alliance and the priorities of the **European Research Area**: innovation and transfer to create and share knowledge, development of new concepts, technologies, and innovations at unprecedented speed, and fostering innovation to support the creation and scaling-up of start-ups and small and medium-sized enterprises (SMEs) in Europe through strengthened technology transfer mechanisms.