



# **Quests for interdisciplinarity: A challenge for the ERA and HORIZON 2020**

Policy Brief by the Research, Innovation, and Science  
Policy Experts (RISE)

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***Policy Brief by the Research, Innovation, and  
Science Policy Experts (RISE)***

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## QUESTS FOR INTERDISCIPLINARITY: A CHALLENGE FOR THE ERA AND HORIZON 2020

Sponsoring a wide range of initiatives and organizational venues to foster, harness, and leverage collaborative interdisciplinarity should become a key priority for EU research and innovation policy.

### Why?

- Science needs to come up with quicker and effective solutions for complex grand challenges and analyses of complex systems that call for crossing departmental boundaries and inter-disciplinarity to generate new knowledge of transformative power;
- Explore and exploit new types of problem-driven and user-oriented R&D research programs that go way beyond well-established modes of targeted, incentivized R&D top-down (Open Innovation, Innovation 2.0);
- Stimulate disruptive innovations to accelerate value creation across different industries and branches of knowledge through intellectual fusion, combinations and interfaces in emerging fields of great power and potentials like synthetic biology, nanoscience, global health or smart cities;
- Scale up the serendipity effect in R&I to venture unexpected synergies, new research topics and research contexts to find out what works and what does not;
- Embark on and strengthen “translational research” to bridge the gap between research communities and the real world outside of the academy to kick-start an epistemic paradigm change.

### Rationales

More often than not, scientific breakthroughs happen to take place at the border of present academic disciplines, or to even go beyond these, thus resulting in an enormous proliferation of interdisciplinary specialties and many new ways in the production, dissemination, and use of scientific knowledge. While some of these phenomena result from the internal dynamics of science, research, and epistemic communities, they also reflect growing public concerns with innovation and with the role of research for economic and social development. As a consequence, we witness strong quests for a veritable paradigm shift in the operating system of public sciences to take it away from blue-sky research toward dealing with, and tackling, real world problems in the first place. In the wake of that, the closed shop of an academic expert community should be transformed into an open space that engages different audiences and communities of researchers, practitioners, users, citizens and stakeholders: Citizen Science, Open Science, or Science 2.0 are buzzwords to characterize that strong trend toward a more demand-driven, participatory research.

Yet even if one does not go for transformative science as an ultimate objective, trans- and multidisciplinary, and interdisciplinarity in particular, appear to be leading the way toward a more effective research organization and governance committed to support and trigger innovation. However, when it comes to the question of how to best stage, support, or organize interdisciplinarity, the jury is still out. While there are plenty of data, insights and lessons on directed research programs and organized research units at universities, we have but next to no empirical evidence on how to best stage interdisciplinarity, about the added value it may produce, and what it may take universities and research organizations to effectively cross narrow disciplinary boundaries, perspectives, and interests. The ironic bottom line is that we need both more interdisciplinarity, and more organizational experiments, to advance it, and to learn more about what is conducive to it, what works and what does not.

In general, sponsoring interdisciplinarity may serve two different objectives: One is to bring together different scientific approaches, competencies, methods and skills to pursue and solve complex real-life problems, to master a technical challenge, or to track down difficult multi-layered research puzzles. The punchline of this kind of problem-driven, engineered interdisciplinarity is that whatever is seen as helpful in solving or coping with the problem or question at stake will be enlisted. Ultimately, it is not about research excellence but about impact in the first place. The other approach to interdisciplinarity, by contrast, focuses on research, its objects, procedures, methods and perspectives. It is to help bring about new scientific discoveries, fields or research puzzles outside the pale of existing departments, academic tribes and epistemic communities. Here, interdisciplinarity is considered a tool, an incubator to inspire scientific breakthroughs via the exchange of unfamiliar ideas and encounters that might be irritating but nudging to challenge and change established research outlooks, routines, and paradigms. Since its outcomes are impossible to predict, that endeavor is no “normal science” project with well-defined objectives, milestones and deliverables. Contingent upon personal or institutional conditions, serendipity, cross-fertilization and new discoveries may or may not happen.

## Challenges

Trying and testing new methods and formats of cooperation, productive irritation and fertilization, require ideas, people, time and space, but, first and foremost, targeted funding: Interdisciplinarity is an inherent part of a new way of doing science and Science 2.0.

Interdisciplinary research (IDR) needs protected space and focus (no distraction, full engagement) to facilitate inter-community collaboration and the development of IDR-specific skills and practices. Communities of IDR-practice have to embrace trust in the expertise, skills, curiosity, motivation and capabilities of colleagues from other fields in order to trigger social and cognitive dynamics that may help generate a blooming group flow and find a common ground of shared interests and level playing field. Interdisciplinarity begins with exposing bachelor students to different disciplines, familiarizing them with different perspectives, perspective-taking and "reading" different scientific vernaculars.

## Venues

Build and support IDR-conducive practices and formats at all levels of the research systems of the EU member states, bolstered by favorable EU framework conditions and initiatives. Readiness to *institutionally* fund bold high-risk research with unclear outcomes and provide for a "common space" that is open for serendipity.

Funding of sites (platforms) and venues rather than projects, people, and programs, such as:

- Discovery Learning Labs for Bachelor students, in particular in professional studies
- Summer schools (both as physical sites and agora, intellectual encounters)
- Retreats/Workshops
- IDR Centers and IDR-conducive initiatives: "Tents" rather than concrete, associations rather than organizations, swift boats rather than big vessels to provide physical space and infrastructure for both researchers and external stakeholders to get engaged in IDR. Meeting places to exchange views, share problems, questions, and interests without fixed agenda that are open for companies, advocacy groups, NGOs and citizens as well: Agora, cafeteria
- "Open funding" devices for IDR outside of normal research funding programs (research calls, proposals and bids, competitive grants).

Fostering IDR as an explicit objective of the ERA could be done in a number of ways:

- Promote and back appropriate new funding devices and institutional features
- Strategically strengthen challenge-based research
- Identify and promote "smart business models" for IDR incubators
- Explore and help implement research assessment features that look beyond disciplinary excellence only to address and measure societal impact
- Support doctoral student exchanges between different programs and institutions.

## Caveats

To spur innovation through a new production of knowledge which, among others, bets on harnessing IDR, looks like a no-brainer. Yet any prudent policy that aims to strategically stir, foster, and incentivize interdisciplinarity needs be aware of, and has to address, a number of caveats: Above all, IDR requires high investments in time and resources for highly unclear outcomes. Since it is risky and fuzzy by nature, interdisciplinarity may lead to less efficiency in doing research. Ironically, IDR may often be highly specialized in nature, hence not easily compatible with other research fields, let alone well-established scientific routines. Moreover, it challenges common quality assurance and evaluation devices which zoom in research excellence as the main, or sometimes only, criteria for measuring performance and impact. This is why interdisciplinary work also carries much higher risks for academic careers than research that is firmly based in traditional disciplines which still serve as gatekeepers of the invisible college of the academy. And last, but not least, interdisciplinarity raises tricky leadership issues to overcome organizational resistance and inertia while there is no one-size-fits-all solution or quick-fix for these governance problems at hand for making it more effective and efficient.

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The Policy Brief sketches the implications of the advance of interdisciplinary research for the European Commission, in particular its research funding program Horizon 2020 and the European Research Area policy. It shows why fostering interdisciplinarity deserves special consideration; what are the important challenges and caveats, and which venues could provide an environment conducive to interdisciplinarity.

*Studies and reports*

