



# ELEPHANT

IN THE LAB

OPINION

## Doing Open Innovation: A practical example

<b>Short title</b>	Doing Open Innovation: A practical example
<b>Long title</b>	Open by Default: Why a Small Austrian Research Organization Opens up Big Time
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How can a research organization systematically spark innovation in science? The Ludwig Boltzmann Gesellschaft (LBG) borrowed its name from the famous Austrian physicist, mathematician, and natural philosopher Ludwig Boltzmann. We are greatly indebted to him for his way of looking at the world and science itself. Boltzmann wrote in the fading 19th century in a letter to his colleagues in Graz, Austria: “I believe that they could have achieved even more had they been less isolated”, reflecting on how science could benefit from being open. Fast forward into the digital age, we are now confronted with a variety of opportunities and challenges to purposefully make science permeable, to become more open and less isolated, to “achieve more”. How do we define “more” and how do we manage this process? The LBG now works on being open by default by applying Open Innovation methods and principles allowing “the use of purposive inflows and outflows of knowledge to accelerate internal innovation...” (Chesbrough, 2006). What we learned so far: there is a way to do it, but you have to do it right (cp. Fecher, Leimüller & Blümel, 2018).

## From Mode 2 to Applying Open Innovation in Science

In the early 90s, Gibbons et al. (1994) referred to Mode 2 as a new way to co-produce (scientific) knowledge in interdisciplinary and transdisciplinary settings in order to solve societal issues. Their motivation to do so comes from participatory action research practices starting in the early 80s showing a different, less isolated way of conducting research that creates a new route to impact (e.g.: in Public Health settings: Baum, 2006). In contrast to Mode 1 production of knowledge, in which scientific and fundamental research is at the core of the epistemological approach, Mode 2 is tackling a different question: “How to co-create science to increase the impact for and with society?” (Gibbons et al, 1994)

For us as a research organization, we strive to spark innovation and invest public money into research that creates value for society. In our opinion, the best way to do so is to foster society's involvement and engagement in research, which is in line with the current [H2020 program](#). The LBG research ecosystem covers a variety of research areas ranging from medicine, life sciences and the humanities to the social and and cultural sciences specifically targeting novel research topics in Austria. Together with academic and implementing partners, the LBG is currently running [21 research units](#) to develop and experiment with new forms of collaboration between science and non-scientific actors such as a variety of companies, the public sector and civil society. With this approach the LBG aims to address socially relevant challenges, to which research can contribute and provide useful support and guidance for others by strategically opening up research.

What does open innovation in science actually mean and how can the scientific system become more innovative in order to tackle societal issues? At LBG, we are convinced that, while theoretical frameworks and models definitely help to guide our work, we need to test and revise them in practice, experiment with unusual knowledge providers (e.g.: citizens, patients), develop new ways of asking the right questions (e.g.: crowdsourcing research questions) and approach new forms of collaboration between science and society. In order to do so, the LBG established the [Open Innovation in Science Center](#) in 2016 as a unique in-house unit to apply Open Innovation in science.

## Ludwig Boltzmann Gesellschaft – Open Innovation in Science Center

We call our approach *Open Innovation in science* as we apply and adapt Open Innovation methods and principles originating within a business context to a scientific context. We are aware, buzzwords come and go, but the underlying common principle of co-producing research will transform science in the long-run as it leads to a different kind of knowledge (more user-centric) and a novel way how research projects are conceived, supported, conducted (ownership of research) and how research artefacts are disseminated ([Nature, 2018](#)). All this holds the potential for less isolation and more openness that is a main driver for innovation. Outside of science there are many examples showing how openness can lead to innovation, for instance via crowdsourcing ([Wikipedia](#) as the largest worldwide crowdsourcing experiment ever conducted),

openly distributing data ([Open collaboration](#) by open-software user communities, von Hippel, 2001) and in disrupting the health sector (e.g.: [Open Source Pharma](#)).

Within economics, Open Innovation refers to make R&D processes within companies more permeable to the outside world allowing knowledge to flow across company boundaries inside out, but also outside in (Bogers, Chesbrough & West, 2016). However, we know that the scientific system works quite differently compared to business units from companies. For instance, knowledge that is produced within scientific discussion is usually publicly funded and should therefore be a public good. Also, incentive systems in science do not measure in revenue or sales numbers, but rather the impact individual researchers or research teams create with what they do. We are convinced that science communication will be increasingly important to fulfill another inherent purpose: educating the public about how science works. What we learned: Open innovation practices in science need to be tailored specifically towards the scientific system. This is why we experiment with Open Innovation methods to explore this scope within our research units, adapt and guide them in a way that is suitable for the scientific system. One important part is to simultaneously evaluate, draw conclusions and provide learnings that feed back into all our approaches.

## Experimenting with Open Innovation Practices

We have been experimenting with a variety of different methods and approaches depending on the need of each project. For instance, we use:

- **Crowdsourcing** to generate new research questions in the health context by asking a variety of crowds (e.g.: crowdsourcing research questions in [traumatology research](#) by involving clinical experts and patients)
- **Lead user workshops** to define and narrow down research topics with lead experts, early adopters and affected patients (e.g.: defining the [research topics for digital health institutes](#); Topic 1: Patient Participation during Diagnosis, Acute and Life-Long Therapy; Topic 2: Securing and Enhancing the Quality of Health Services and Patient Safety)
- **Ideas lab approaches** to use innovative settings to form inter- and transdisciplinary research groups (e.g.: [to form new groups](#) aiming to support children of mentally ill parents)
- **Experts by experience**, to involve patients in steering the research agenda of our research groups to better address the needs of patients (e.g.: experts by experience, children of mentally ill parents, advising and reflecting together with the [research group "Village"](#))
- **Lab for open innovation in science** to train researchers as well as the public on how to co-produce knowledge and learn open innovation principles and methods (e.g.: with our [one-year training program for researchers](#) to teach open innovation methods and develop projects based on these principles)
- **SCIENCE4YOUTH program** to train the next generation of researchers in using open innovation methods and principles (e.g.: with our [Science4Youth training program](#) for adolescents from the age of 16)

## Learnings from Applying Open Innovation Methods and Principles in Science

Drawing from our own experiences, there have been a variety of important learnings that we are very happy to share:

- 1) **Knowledge transfer and capacity building: learn quickly.** Before founding the start-up like Open Innovation in Science Center in 2016, LBG initiated a pilot crowdsourcing project and a training program for scientists called Lab for Open Innovation in Science. This helped us to experiment with new methods, disciplines and target groups and learn from first-hand experiences. By conducting these projects, capturing the most important learnings is crucial to move forward. For instance, tailoring the training programs towards different target groups; experimenting with different format lengths and content. This is why we started an education program to enhance our understanding about open innovation practices (e.g.: SCIENCE4YOUTH program for adolescents to educate the next generation of future scientists). It also allows us to initiate new projects and build systematic structures and models for our organization. For instance our [second “Tell us!” crowdsourcing project](#) was developed in a Lab for Open Innovation in Science training from one of our LBG researchers. Also, the way we set up the [governance structure of our research group “Village”](#) reflects our approach to implement learnings in terms of steering research projects.
- 2) **Get out of your research bubble right from the start.** We involve people coming from outside of academia from the beginning on with the goal to inspire research, identify topics that have not yet been addressed by science and to start a dialogue between scientists and those potentially affected by their research and the public. In our second „Tell us!“ crowdsourcing project ([www.tell-us.online](http://www.tell-us.online)), patients and experts submitted research questions they considered most important for science in traumatology. These questions do not stem from scientists themselves – 80% come from patients, and 20% from experts working with patients. In order to reach out to these communities, a variety of communication measures are necessary. A prerequisite to be successful is an open-minded attitude and willingness to engage with the public. Another example is our recent [successful crowdfunding campaign](#) together with our [Ludwig Boltzmann Institute for Human Rights](#) on torture prevention. The most interesting finding was not foremost the funding we managed to collect, but the new cooperations that have been initiated for the [Atlas of Torture project](#). This would probably never have happened otherwise.
- 3) **Nudge organizational change.** When applying these open innovation methods, organizations need to hold the absorptive capacities to cope with changes in workflow, administrative processes, new forms of collaboration and teamwork. Introducing Open Innovation in science can lead to friction. For this, we systematically analyze the effect of our individual approach on the larger research organization and aim to initiate organizational change to build a research organization embracing Open Innovation and Open Science.

## OPINION

It takes some time to see the effects of our actions, how we can create a different kind of impact and the work we want to achieve. To a certain degree, we see our own activities as a testbed for open innovation in science. We strive to identify the premises for opening up which includes identifying individual drivers (e.g., motivational factors: “How can we motivate researchers to work openly?”), overcoming structural barriers (e.g., “How can we build a rewarding system for researchers to work openly?”, also “How can we build organisations or research groups having enough absorptive capacity to work openly?”) and anticipating pitfalls (e.g., “How do we deal with IP rights or data protection?”). We find that within every project and every discipline we work within our LBG research ecosystem, we identify new needs and approaches to open innovation. After all, no one size fits all.

In the tradition of Ludwig Boltzmann, we are convinced that we can achieve more with less isolation. It is not an idealistic or dogmatic approach, but rather a tangible strategy for research to deal with digitization and societal needs. We still have a long way to go and need to provide substantial long-term proof for our approach. In the meantime, we are thrilled to share our experience with others to become open by default.

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