



Working Group on Impact Assessment

Impact of RTI-Policy on the relationship between science and society

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Focus

The fteval Working Group on the "Impact of RTI policy on the relationship between science and society" met between September and December 2020 regularly to discuss the scope of the topic. This resulted in the elaboration of a framework that enables a shared understanding and informs the discussion on the assessment of this RTI policy impact. We mainly focused on RTI policies in Austria aiming at participatory approaches in research, as these policies have gained increasing attention on the policy level within the last years and have the potential to directly affect the relationship between science and society.

Four building blocks of the underlying topic were identified: the first three deal with defining the "Why", "Who" and "How" of participatory approaches in research, while the fourth building block contains an exemplary list and brief descriptions of existing RTI policy interventions in the form of specific research funding programmes with a focus on participatory approaches in research.

Why

Why is involving society in science or more specifically in research relevant for RTI policy? What is the justification for involving society in science respectively research? And what are the intended effects?

In the discussions, the members of the working group put forward numerous arguments from the literature, information from workshops as well as their own experiences to emphasize the relevance of RTI policy for the relationship between science and society. Subsequently, the most important reasons for RTI policy to foster the involvement of society in science or, more specifically, in research were prioritized.

The following four main reasons serve to identify the questions that need to be addressed to examine the influence of RTI policy on the relationship between science and society and to inform the discussion on the assessment of the effects.

Reasons for RTI-policy interventions aiming at participatory approaches in research:

- ⊕ Promote **public understanding** of science and **science literacy**;
- ⊕ Increase the **legitimacy** of RTI policy interventions and support the **co-ownership** of society in science and research;
- ⊕ Increase the **relevance, responsiveness and inclusiveness** of science and research, ensuring that its outcomes align with the needs, values and expectations of society;
- ⊕ Improve **transparency and society's trust** in science and research.

Who

Who is actually meant by "science" and "society"?

Science is commonly understood as the pursuit and application of knowledge and understanding of the natural and social world, following a systematic methodology based on evidence (e.g. Science Council, UK). The application of scientific methods to gather a systematic and organized body of knowledge is the key differentiation to the broader concept of research. Although the production of knowledge, i.e. the systematic application of scientific methods, changed considerably over time, it is the **specific way**

of systematically producing knowledge in science we focus on in our definition and not – in contrast – on the place of knowledge production, i.e. scientific institutions such as universities or public research institutes.

In this contribution, we understand scientific knowledge production as suggested by Gibbons et al. (1994), namely Mode-2 science. In Mode-2, scientific knowledge creation is seen as an interdisciplinary and non-hierarchical activity that is highly contextualized within society, with the latter playing an integral role in knowledge production. Additionally, the **related approach of participatory research highlights the inseparable relationship between science and society** and explicitly addresses the political nature of knowledge production as well as emphasizes its epistemological diversity.

Society is a broad concept and means in very general terms a group that interacts. Most encompassing, society signifies the entirety of mankind (Menschheit), but more often it refers to nations and / or particular groups. Despite the breadth of its meaning, the term society remains often undefined in RTI policy and is equated with public, mini-publics or specific segments of society that are target groups for policy interventions (e.g. pupils). Research on science-society-interactions repeatedly pointed out that in contrast to common understanding, there is no single public, but a plurality of different “publics” on different topics. These “publics” do not pre-exist, but emerge and develop in the context of specific technological controversies (e.g., genetically modified organisms) and come to represent society in collective decision-making processes (e.g. concerned citizens, patients, workers, family members, members of an ethnicity or religion, etc., Dryzek 2012). The diverse groups and publics have different characteristics, interests, needs, values and norms. Given the breadth of the meaning of society and the plurality of publics affected by research and technology, RTI policies must define more precisely what it means by society because **different publics and groups require different formats of participation, interaction, cooperation, knowledge transfer and co-creation.**

How

In which ways is society involved in science and research?

The specific formats of interaction between science and society can be differentiated by the degree of involvement of sub-systems or parts of society: from receiving information about research results and being consulted for feedback, to getting involved in research projects and becoming a collaboration partner or even lead in a research project, i.e. inform - consult - involve - collaborate - empower (International Association for Public Participation, Spectrum of Public Participation, 2014). **With higher degrees of involvement, the empowerment of those who are affected by research increases, introducing a shift of power and ownership towards society.**

Societal actors can be involved in different areas of science and research, namely,

- ⊕ in research projects along the research cycle: planning phase - conducting research - dissemination of findings (Hoekstra et. al., 2020),
- ⊕ in the evaluation of project proposals and research programs,
- ⊕ and in strategic decision making such as co-shaping of the scientific agenda and technology policymaking.

Depending on the reason (Why) for involving different groups (Who) and considering the degree of involvement, a variety of specific formats of interaction (How) exists, such as citizen juries, expert

advisory groups, patient and public involvement, consensus conferences, social labs and science shops, to name just a few (Rowe and Frewer, 2005). Still, there is great potential for new, creative and experimental formats to involve society in science and research (Schaefer and Kieslinger, 2016). RTI policies should thus support the development, experimentation, evaluation and dissemination of new and creative formats of societal involvement in science and research.

To have a measurable impact on the relationship between science and society, RTI policies would need to clarify:

- ⊕ **What is the RTI policy aimed at?**
- ⊕ **Who should the RTI policy address and who does it really want to involve?**
- ⊕ **In which ways should they be involved?**

RTI policies supporting participatory approaches in research

RTI policy has a direct impact on the relationship between science and society through different modes of interventions, e.g. for Austria

- ⊕ national strategies like the Austrian Open Innovation strategy
- ⊕ performance contracts with the Austrian universities emphasizing the Third Mission
- ⊕ establishment of dedicated institutions like the Center for Citizen Science or the Open Innovation in Science Center
- ⊕ science events and initiatives like the Researchers Night (“Lange nach der Forschung”), Kid’s University or Open Labs
- ⊕ funding of participatory approaches in research.

In the following, we focus on selected Austrian funding programmes that have been introduced in recent years to promote participatory approaches in research (funding programmes that solely support citizens and patients taking part in research studies and clinical trials are not considered here).

At the outset it has to be mentioned that a strong impulse for public participation in Austria came from research institutions that participated in and coordinated European Research projects (Framework Programme) aimed at increasing public participation in science. The programme line “Science with and for Society” (SwafS) was and is critical for establishing a vibrant Austrian research community in the area of public engagement and Responsible Research and Innovation (RRI). By participating in SwafS projects, the Austrian research community connected with European and global networks in this area and stimulated practice and debate of public engagement in Austria. RRI aims at better aligning research and innovation with societal needs and promoting gender equality, public engagement, science literacy and science education, ethics and open access. RRI targets all stakeholders of research and innovation and all types of involvement, with particular emphasis on co-creation.

The current H2020 programme line “Science with and for Society” has so far allocated 462 million Euro over seven years to science and society interactions, including public engagement and related topics. The programme was and is crucial for supporting Austrian university and non-university research institutes in experimenting with, and promoting public engagement activities in research and innovation. Austrian research organizations were very successful in the highly competitive SwafS programme. With a success rate of 19.2% (all countries 13.2%), they participated in 84 projects (37.2% of all projects), coordinated 21 of them (9.1% of all projects) and until now obtained funding

of nearly 25 million Euro (7.2 % of total funding) (<https://eu-pm.ffg.at/ui/login/>). Projects included e.g. RRI Tools, FoTRRIS, PROSO, NewHoRRizon and many others.

Selected Austrian funding programmes

Benefit / AAL (FFG)

Description	Involvement of end users (primary, secondary, tertiary) in the research and development of ICT-based products and services with the aim of maintaining and improving the quality of life of older people and guaranteeing them the longest possible autonomous life. Since 2008, projects have been supported with over 70 million Euro.
Ambition	Development of products and services that respond to the needs and wishes of the target groups.
Target groups	End users of products and services (As primary end users we understand citizens directly, in their personal capacity. Secondary end users are end user organisations' staff in their professional capacity, entities representing groups of persons, or networks of elderly people (family, friends, neighbourhoods...). Tertiary end users refer to institutions such as insurances, communities...).
Type of involvement	Consultation, involvement, collaboration and co-creation in all stages of research.
Conclusion	The focus in the AAL and benefit programmes is not just on users in the sense of consumers and their needs and wishes; it goes further, because the programme is designed to help solve a key societal challenge. Hence, secondary and tertiary end users are involved and collaborate in order to pave the way to successful implementation in a very sensitive and highly regulated market. Researchers and developers find these participatory approaches challenging, but also rewarding.

#Connecting Minds (FWF)

Description	Funding of transdisciplinary science projects in a two-stage programme. In the first stage, two to five researchers develop in cooperation with non-academic stakeholders a project idea and its realization (workshops funded with 10.000 Euro), in the second stage the full proposal is submitted. The funded projects receive 200.000 Euro annually for up to five years. The first call ended in spring 2020; the total volume amounts to four million Euro (first and second stage).
Ambition	Scientists initiate and implement research processes together with societal actors in order to support the search for solutions to complex current issues and to promote commitment and collective learning. Dissemination of the dialogue between science and society, transfer of research results into practice.

Target groups	Scientists, representatives of NPOs/NGOs, associations, public administration, firms, health and teaching facilities.
Type of involvement	Involvement, collaboration, empowerment.
Conclusion	Through the joint development of the project, the involvement of society takes place at a very early stage of the research process and is continued in the concrete implementation. The generous funding and the rather long project duration permit profound cooperation and co-creation.

Innovationslabore (FFG)

Description	Structural measure to support the systematic and early-stage involvement of users in innovation processes (user-centred innovation). The innovation laboratories, introduced in 2016, are used in thematically open calls or can be located in specific thematic fields (e.g. urban mobility labs), run up to a maximum of ten years and receive a funding of up to five million Euro (though most funding programmes use this instrument with reduced time and resource limits). So far, these infrastructures received funding of 29 million Euro.
Ambition	Opening of the innovation process (Open Innovation), support of co-creation, creation of a community, transmission and transfer of know-how.
Target groups	Open for all - firms, research institutes, universities, communities, citizens, pupils, etc. (many different agents in each laboratory).
Type of involvement	Involvement is neither a precondition, nor is it specified. Instead, the laboratories serve as platforms and provide infrastructure and services, where all interested parties can participate in co-creation processes, search for information and participate in exchange. Information, consultation, involvement and collaboration.
Conclusion	A thematic and structural measure, that supports the creation of need-oriented solutions for societal challenges through open innovation processes. The broad range of offerings and the longer-term orientation enable a variety of forms of participation.

PPIE: Public and Patient Engagement and Involvement (LBG)

Description	Top-up funding for citizen and patient participation activities in ongoing research projects, open to all disciplines. The funding amounts to 20.000-60.000 Euro for six to twelve months. The first call ended in October 2020 and has a budget of 600.000 Euro in total, the second PPIE call will open in autumn 2021.
Ambition	The active participation of patients and the interested public in research processes should increase the quality and impact of the research, ensure its societal relevance and push innovation processes.

Target groups	Patients, citizens.
Type of involvement	Involvement and collaboration. Involvement in all stages of the research process, starting from the development of the research question to the interpretation of data; involvement also in governance processes.
Conclusion	Rather small funding opportunity, however with a dedicated focus on public and patient involvement. Moreover, it is currently the only programme in Austria that involves society already in the funding decision: two representatives of the public, thereof one patient and one public member from the field of public health and two young persons (16-25 years) with basic knowledge of scientific processes are members of the panel.

Sparkling Science (OeAD)

Description	Funding programmes with calls between 2007 and 2016 and a funding volume of 35 million Euro, the last projects were finished in 2020. The projects are based on already ongoing research projects, which were largely financed by other sources.
Ambition	Reduction of structural barriers between the educational and the scientific system in Austria. The participation of pupils in research projects should raise the interest of young people in research and science.
Target groups	Pupils and teachers.
Type of involvement	Consultation, involvement and collaboration.
Conclusion	A wide-ranging programme with many perennial projects. Participation and success often depend critically on the engagement of teachers and schools, that allow for and support participation. Large variation in the projects.

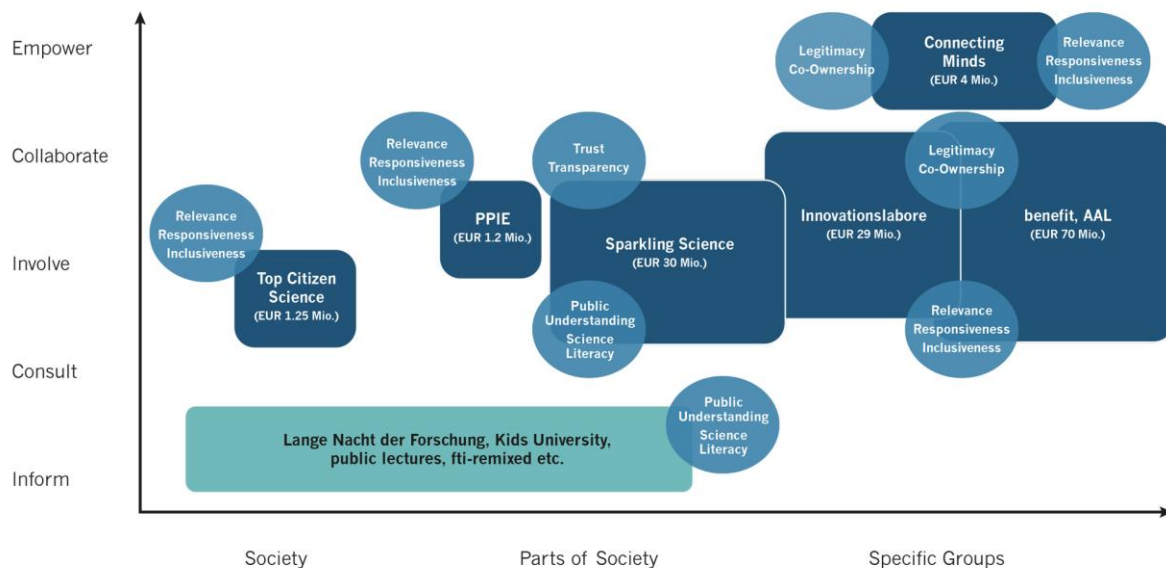
Top Citizen Science (FWF)

Description	Since 2016, running FWF-funded projects can be augmented by citizen-science components. The funding per project amounts up to 50.000 Euro, the volume per call totals currently 250.000 Euro.
Ambition	Substantial, additional scientific knowledge gain in research projects.
Target groups	Citizens with highly specialized knowledge or expertise (knowledge communities), young target groups.
Type of involvement	Involvement and collaboration. The involvement in research projects is freely configurable, but due to the programme design it mostly consists of generation/collection and interpretation/analysis of data.
Conclusion	A rather small program (21 projects so far), in which the possibilities of participation are limited to certain stages by its design as an extension project for running research projects. Funding is based on

criteria of excellent science, i.e. when a research project requires the input of society to achieve the desired excellent results.

The abovementioned selected Austrian funding programmes supporting participatory approaches in research can be mapped according to the degree of involvement, the specificity of the society and the main rationale of the programme. This preliminary mapping gives an overview and may serve as the basis for further discussions.

This mapping is not to be read as a ranking or rating, but instead solely aims at displaying the variety of programmes in Austria. In this sense it serves for locating the programmes in the space opened up by plotting aspects of society and participation, and potentially allows to identify gaps in the present funding landscape. Please note that the figure only considers the selected Austrian funding programmes discussed above.



Mapping of selected Austrian funding programmes supporting participatory approaches in research

Measurement of the "Impact of RTI policy on the relationship between science and society"

RTI policy might influence the relationship between science and society in different aspects:

- ⊕ Promote **public understanding** of science and **science literacy**.
- ⊕ Increase the **legitimacy** of RTI policy interventions and support the **co-ownership** of society in science and research.
- ⊕ Increase the **relevance, responsiveness and inclusiveness** of science and research, ensuring that its outcomes align with the needs, values and expectations of society.
- ⊕ Improve **transparency and society's trust** in science and research.

To measure the impact of RTI policy on the relationship between science and society, different **surveys** have been introduced. These instruments aim to give insight into the level of information about science and the level of interest and involvement in science as well as the attitudes towards science, e.g.:

- ⊕ Eurobarometer surveys on Science & Technology and on Responsible Research and Innovation
- ⊕ German Science Barometer on the relationship between science and society
- ⊕ Open Science Monitor by the European Commission on open access, collaborative and transparent research across countries and disciplines
- ⊕ U.S. Science and Engineering Indicators with its Report on Public Attitudes to provide a portrait of public attitudes and understanding of science and technology in the United States

Further, the European Framework Projects MoRRI and Super MoRRI provide a sound **conceptual framework** and associated methodology to allow robust monitoring of the current state and evolution of Responsible Research and Innovation and its scientific, social, economic and democratic benefits. Hereby, the democratic benefits comprise effects on the relationship between science and society.

However, a limited set of indicators will not do justice to the multidimensional character of the undertaking. The relationship between science and society must be considered in all of its dimensions, bearing in mind that this relationship is embedded in a **complex system of formal and informal interactions** that are open to change over time. RTI policy interventions to create and maintain such interactions are themselves important mechanisms for opening a space to shape the relationship between science and society and **define collaboratively the benefits** of this relationship.

What actions should be taken?

Science has the potential to tackle some of the grand challenges our society is facing. At the same time, however, science is also at least in part the source for some of these challenges. Therefore, the relationship between science and society has a political dimension and should be guided by realistic expectations, be mutually supportive and based on transparency, participation and mutual trust. In order to reflect these principles, RTI policy should aim to better align science and research with societal values, needs and concerns. To this end, programmes should be more strongly promoted, which encourage the integration of a wide range of societal actors along the whole research and innovation process. This could not only increase the relevance, responsiveness and inclusiveness of science and research but could also promote the public understanding of and the trust in science and research.

This requires a **clear definition** concerning the parts of “**society**” RTI policy and research-funding programmes intend to address as well as an **in-depth understanding of the influence of RTI policy** and research funding programmes on the relationship between science and society.

The Austrian funding programmes supporting participatory approaches in research are neither specific on which parts of “**society**” to address, nor on their intended influence on the relationship between science and society. Although further analysis is needed, the first tentative results indicate that Austrian research funding programmes have the potential to influence the public understanding of science and research, as well as their relevance and responsiveness. However, they may have little influence on the inclusiveness of science and research and the empowerment of society in science or the legitimacy of RTI policy.

In the following, we propose three measures to deepen the understanding of the role RTI policy measures can play in improving the relationship between science and society.

(i) To capture the status-quo, a **survey** should be designed to gather information on programmes promoting public participation in science and research as well as their impact on the relationship between science and society. Both the effects on representatives of the society (to what extent the participation affected their attitudes towards science and research, their interests and their behaviour, influencing their life in the long run) as well as the representatives of science (to what extent has participatory practice affected their attitudes, behaviour and research) in these programmes should be considered. Another aspect to cover is the relationship between society and science as a whole (Did mutual acceptance, trust and credibility change? etc.).

(ii) In line with the goals of the funding programmes, corresponding **indicators should be developed collaboratively** from representatives of science and society. They should be included in the evaluation protocol of the relevant programmes. This could build on existing efforts within the EU Framework Programme (e.g. the SuperMoRRI project). A collaborative indicator development for each funding programme generates indicators tailored specifically to the goal and audience of each programme. This, in turn, enables policy makers to draw meaningful conclusions concerning the impact of the measures taken. The collaborative process of developing indicators itself further sheds light on the motivational factors and/or aspired impacts from both scientific and societal actors, as well as potential divergences. This allows policy makers to better align policy measures with their audience's needs. Apart from evaluating the goal achievement of the programmes, the indicators should take the timing and attribution of effects into consideration.

It should be noted that there is a trade-off between using individual indicators for each programme and standardised ones across different programmes. The former is able to capture features that are more specific whereas the latter allows to compare different programmes with participatory elements. Individual indicators for each programme, while providing meaningful information on a specific mechanism, may lead to an overwhelming flood of individualistic, non-comparable indicators, which impairs their usefulness for a comprehensive policy instrument evaluation. Therefore, a balance between individual and general indicators has to be kept. Drawing connections between individual programme indicators and deducing a handful of general indicators across programmes enables comparability, avoids a short-term and limited view on policy measures and allows a more strategic portfolio approach.

(iii) There is ample experience and knowledge on how to work with science society interactions on the national and the European level, which has been developed within the European Framework Programmes since the early 2000s. Moreover, Austria has a rich and diverse research landscape including organisations with considerable experience in this field. Some of them are part of [fteval](#) and the [Austrian RRI Plattform](#). Policy makers and research funding organisations should **bring together, learn from and build on** this experience and support them by dedicated funding programmes in order to tackle the grand challenges our society is facing.

These suggested immediate measures could be a first step to explicitly address the influence of specific research funding programmes on the relationship between science and society. The long-term goal of this exercise is to increase the **relevance, responsiveness and inclusiveness** of science and research, as well as society's **trust and empowerment** in science and research.

References

- Dryzek, J. (2012). *Foundations and Frontiers of Deliberative Governance*. Oxford University Press.
- Gibbons, M., Limoges, C., Nowotny, H., Schwartzman, S., Scott, P., & Trow, M. (1994). *The new production of knowledge: The dynamics of science and research in contemporary societies*. Sage Publications, Inc.
- Hoekstra, F., Mrklas, K. J., Khan, M., McKay, R. C., Vis-Dunbar, M., Sibley, K. M., Nguyen, T., Graham, I. D., SCI Guiding Principles Consensus Panel & Gainforth, H. L. (2020) A review of reviews on principles, strategies, outcomes and impacts of research partnerships approaches: a first step in synthesising the research partnership literature. *Health Res Policy Sys* 18, 51. doi: /10.1186/s12961-020-0544-9
- Rowe, G. & Frewer, L. J. (2005) A Typology of Public Engagement Mechanisms. *Science, Technology, & Human Values* 30 (2). doi:10.1177/0162243904271724
- Schaefer, T. & Kieslinger, B. (2016) Supporting emerging forms of citizen science: A plea for diversity, creativity and social innovation, *Journal of Science Communication* 15(02) doi: 10.22323/2.15020402