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Setting Research Agendas: A Permanent Fight for the Scientific Communities

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A fundamental question in relation to academic freedom is the setting of research agendas. In relation to this issue, this article first points to the great diversity of research as a result of the complex structure of the research ecosystem. Against this backdrop, the article continues by discussing six different steps in setting a research agenda. This, in turn, leads to a comparison of the two main approaches to set up a research agenda: bottom-up and top-down. Finally, the article presents recent tendencies and limitations to research agendas.

Introduction

First of all, when pursuing discussions about academic freedom, it is important to remember the great diversity of research in terms of its (1) organization, (2) rhythm of development, (3) need for infrastructures, (4) governance, and (5) evaluation. In addition, research is an activity which develops in an ecosystem. This fact contributes significantly to making decision processes concerning Research not as transparent as one would wish. This is an effect of the complex structure of the Research ecosystem, which can be defined as consisting of (1) actors, people and institutions; (2) financial and technical means; (3) governance, decision processes and selection bodies; and (4) dissemination and transfer of the results.

Blurring further the issue of who is really in control, these different components cannot really be separated. This is a reality, even if they the components are present in ways and at levels that depend on the research performed. A consequence of that is the need, when studying any question related to the way research operates or is being planned, to properly analyse the role played by its different components. On top of

that, the level at which all this is considered – local, regional, national, European, international – introduces significant differences in the ways processes are set, in particular in which timeframe they can be successfully implemented. The key process is the setting of research agendas.

What is a Research Agenda?

A research agenda can be considered to consist of six steps. A first step is to fix some research objectives. They can be rather short term or more long term. They can deal with a very specific problem or propose to explore some more open avenues.

A second step is to determine the support necessary and the sources to be mobilized. Too often, this is viewed only from a financial point of view when other dimensions are equally relevant, such as the technologies which need to be implemented, and sometimes aspects even more subtle to pinpoint.

A third step is to identify the personnel needed to achieve the research objectives. This is a critical issue since one tends to focus on the leaders of the project. Although they are of course essential to help lay out the strategy, a much broader category of personnel needs to be taken on board. In the first place, they need to be trained and have the way they intervene settled throughout the research planned. In some cases, this goes as far as establishing some new training schemes.

A fourth step is to determine the process to be followed for establishing and adapting a timeframe. Indeed, an ambitious research agenda may require introducing various phases. This means determining the right moments along the way to appreciate the advancement of the project and to introduce possible modifications to the initial agenda, which may appear needed.

A fifth step is the launching of the project. This may sound like a non-question when, in fact, choosing the right moment to put in place a research agenda may have a considerable impact on its success and the way various components involve themselves in it. This is a place where interference with politics and political perspectives is to be considered in the right way.

A sixth step is then the implementation and exploitation of results of the research project. Needless to say, this is a critical step for a given research agenda, but also for the credibility of the process used to set the research agenda. Nevertheless, it is a generic truth that research is open-ended. This means that one may find that, in the end, the goals initially set for a particular research agenda were only partially the right ones or else that much more interesting features have been uncovered during the research process, justifying a modification of the goals.

Of central importance in this list is of course who decides what? It is here that the issue of the modalities of the implication of the scientific communities comes up. A distinction between two main approaches to set up a Research Agenda can be made:

(1) *Bottom-up*, meaning that the initiative to propose a project is left to scientists. It also implies that scientists define the content and the modalities of the

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implementation of the project. In particular, the administrative institution in charge of the call does not determine projects.

(2) *Top-down*, meaning that the institution issuing the call has determined some priorities and that only projects addressing these priorities will be considered, possibly with some further constraints.

Bottom-up Versus Top-down

After the warnings stated above about diversity and complexity involved in a research agenda, the (pseudo-)definitions just given need to be taken with some caution. Indeed, many variants appear at the implementation level. It is rare that a single institution has full control of a research programme and does not need to coordinate with other bodies, some of them not under its own control. Nevertheless, it is useful to refer to these two broad approaches to discussing the setting up of research agendas.

The Scientific Communities in a Bottom-up Process

The first obvious difficulty in describing how scientific communities can be involved has to do with the extremely diverse ways in which they are organized or represented: by discipline, by country, through institutions (academies, universities, etc.). For example, many countries – such as France, for instance – have put in place national committees to deal with the setting up of Research Agendas. Members of such committees are most often partly elected by their peers and partly nominated, with the different members having the same rights.

Nevertheless, among the criteria critical to qualifying a process as 'bottom-up', one can single out the following: (1) the initiative for the projects and their content are in the hands of scientists; (2) scientists evaluating the projects are chosen by committees of scientists, and they base their funding recommendations solely on the quality and the originality of the projects resulting from a scientific analysis; and (3) the final decision is completely in the hands of the scientists evaluating the projects.

These criteria are, for example, fully implemented at the European Research Council (ERC) with two more decisive empowerments of the ERC Scientific Council. This is fully responsible for establishing the annual work programme, describing the calls and the allocation of money between the calls. The European Commission can only veto the work programme globally, something which has never happened since the creation of ERC in 2007. In addition, the members of the ERC Scientific Council are proposed by an independent Identification Committee consisting only of well-recognized scientists. This consolidates the fact that the choice of ERC panel members is fully in the hands of the ERC Scientific Council, hence fully under control of the scientific communities.

That such a system could be implemented was the outcome of a political battle where representatives of EU Member States and of the European Parliament

imposed their views on the European Commission. This happened at a moment where the Commissioner in charge of Research was Philippe Busquin, a scientist himself and a former Belgian Minister of Education, who supported this view unequivocally. However, this construction has been challenged a few times, typically every seven years. At the moment, it is being challenged in the process of defining the format of the next European Framework Programme for Research and Innovation (FP). In the preparation of 'Horizon Europe' – the ninth Framework Programme – the central legal office of the European Commission (EC) produced a note to the EC President presenting the ERC governance as an 'anomaly that should be stopped'. Thanks to political support at the highest level, such an attack could be diverted. The fact that some politicians were then well aware of the way in which research functions, was decisive in getting their support. Of course, it was important that the Commissioner in charge of Research, when the attack came, was Carlos Moedas, who could understand from his personal experience the critical value of the scheme in place.

The Scientific Communities in a 'Top-down' Process

In a 'top-down' process, the scientific communities are not necessarily involved in all steps. Research priorities can be established at a political level, which in itself is not something problematic, as some issues make it to the political agenda for legitimate reasons. What can be a problem is how to make sure that the most competent scientists are involved in the technical definition of the objectives and that the choice of people in charge of the programme is not biased by the political process. Furthermore, after the call is made, the selection process may introduce implicit constraints or criteria, which are not always transparent and result from the action of some lobbies. This can also concern the fact that full information on what is really expected is not readily available if you are not in the circle of the promoters of the programme.

'Top-down' projects may also have some objectives of an indirect scientific nature. For example, to make sure that, in order to deal with some issues, a critical mass is being put in motion. This involves, in particular, the fact that enough people, both technicians and researchers, are competently trained in certain areas, typically in emerging ones.

It is therefore not surprising that such approaches are connected with the setting up of consortia, occasionally of a somewhat larger size, which requires some special managerial skills. This explains why the confirmation of a research agenda to be part of Framework Programmes is always more complicated to finalize. It also justifies that its organization tends to change from one Framework Programme to the next, introducing some learning periods for laboratories which may be interested in getting some support from it.

Note that such an adaptation is not needed in the context of a fully 'bottom-up' programme. The only modification there, would be some minor changes in the panel structure. Hence, the remarkable stability of the ERC structure along three FPs. This

goes even further. In the midst of a Framework Programme, the ERC Scientific Council was able to introduce a new component to its programme, the Synergy programme, allowing groups of up to four researchers to submit truly ambitious projects requiring very complementary expertise. The main objective was to create a space where truly interdisciplinary projects could be submitted and appropriately evaluated.

What are the (Current) Tendencies?

The current environment is severely constrained for several concurrent reasons. First, due to the war in Ukraine and the difficult economic situation, in particular in relation to the cost of energy, research budgets are under great pressure. Second, urgencies to deal with environmental issues, and the breadth of actions needed to be implemented to act effectively on such matters, lead to attempts to come up with short-term measures to 'solve the immediate problems', rather than opening a new level of understanding of the phenomena we face. Third, in many countries, career perspectives offered to young researchers are rather bleak, especially in the public domain. This is, of course, related to financial difficulties a number of academic institutions are facing.

In such a constrained environment, three tendencies can be identified. First, financing bodies opt for short-term priorities, often with narrowly defined objectives. Second, they also negotiate compromises on the objectives at the political echelon, often without properly taking into account the opinions of the most qualified scientists. Third, they challenge the value of fundamental research for not being able to deliver strategies to be put in action quickly, when its objective is necessarily the search for a deeper understanding of the problems to be tackled.

The outstanding example of the development of the mRNA vaccine to fight the COVID-19 pandemic should be kept in mind. The extraordinary achievement that the development of a radically new vaccine in an incredibly short time to act on a new virus is, unfortunately, widely underestimated. The long-term investment over decades in the understanding of the way RNA functions enabled scientists to identify a process to block the action of the virus. The speed at which key people decided to try to test the vaccine and the mobilization which accompanied this decision also need to be acknowledged and valued.

Limitations to Research Agendas

In recent years, some prominent people have called for limiting research in some areas. Three significant examples are: cloning, generative Artificial Intelligence (AI) and geo-engineering.

Cloning

The issue of placing limits on cloning research appeared essential as soon as cloning became possible. It started with animals, but the core discussion was of course about humans. The debate was very heated at the turn of the twenty-first century. For the moment, there is no universal ban, although the United Nations had a divided vote on this issue. In the background, there is the issue of stem-cell research, which makes it possible to reproduce many different types of cells under very specific conditions. Therefore, the topic has gained a new timeliness with the wide availability of precise genetic engineering through the mastery of CrispRCas9 techniques, which brings the possibility of gene manipulation to a new level of precision. The key issue is of course whether some genetic transformations can be passed down to descendants.

Generative AI

The recent progress made in Generative AI and the breadth of its possible domains of application led to an open debate on whether limits on research in this area should be introduced, in particular in the absence of a worldwide established and accepted regulation. A request was made openly by some of the true leaders in the field, such as Yoshua Bengio, a Canadian computer scientist based in Montreal. It is probably simplest to quote some excerpts from a blog he published in May 2023 entitled 'AI scientists: safe and useful AI?' (Bengio 2023). Here are three of them:

> I have been very vocal about the importance of accelerating regulation, both nationally and internationally, which I think could help us mitigate issues of discrimination, bias, fake news, disinformation, etc.
>
> The bottom line of the thesis presented here is that there may be a path to build immensely useful AI systems that completely avoid the issue of AI alignment, which I call AI scientists because they are modelled after ideal scientists and do not act autonomously in the real world, only focusing on theory building and question answering.
>
> The model for this solution is the idealized scientist, focused on building an understanding of what is observed (also known as data, in machine learning) and of theories that explain those observations. Keep in mind that for almost any set of observations, there will remain some uncertainty about the theories that explain them, which is why an ideal scientist can entertain many possible theories that are compatible with the data.

But the debate is also underway within the big corporations. Just to give an example, the person in charge of ethics at Google has recently decided to leave the company. More than that, according to first-hand information I received from the person concerned, a researcher working in this company who had written a blog

in which he argued for the need to have an international regulation for AI has been censured. He decided to quit the company, considering this incident an abuse on the part of his employer.

The main difficulty concerning AI is connected to the speed at which it is moving forward. This makes it hard to anticipate what it will be able to do in coming years, since so much has been achieved in such a short time. Even the form it might take is not yet clear, and therefore it is not easy to identify which sector of society might be the most affected by its use. It is expected that it will be broad, but how broad is still a very open question. The heart of the matter is whether it will be able to do a number of things completely autonomously.

Geo-engineering

In spite of the denials of climate-sceptics, the environmental crisis caused by warming of the Earth is with us, and an urgent and sustained action is needed to prevent temperatures projected to be reached by the second part of the century from rendering some regions of the world uninhabitable and from making the impact of major disturbances disastrous. This has prompted some people to envisage geo-engineering actions to prevent the worst effects. Various avenues have been considered, and some explored. One consists of sending many particles into the stratosphere to reflect the sun's radiation and thereby alleviate the warming. Pursuing such actions has become accessible to structures much less powerful than States, with the risk of having attempts being developed without any responsible gatekeeping. This is of course problematic, since some may be irreversible and have very negative secondary effects! Recently, the Paris Peace Forum on Geo-engineering presented a report whose conclusions seem to leave the door ajar regarding the use of geo-engineering in attempts to master the climate. Clearly, scientific communities have not engaged themselves significantly in this debate.

How Can Scientific Communities Deal with the Control of Research Agendas? Obstacles to Actions by Scientific Communities

In my opinion, obstacles to actions by scientific communities have two components. One is internal to scientific communities. They are divided, often antagonistic to each other because they are fighting for their own territory. In addition, they too often only have a partial view of the problems to be addressed, which can be perceived in their global complexity only through a truly multidisciplinary approach. However, there are also external obstacles. One must recognize that there is a lack of effective connections between scientific communities and political echelons. This is the result of a lack of opportunities for genuine exchanges. It is also directly related to the small number of structures in which the two groups can interact on a regular basis. In France, the *Office*

Parlementaire pour l'Évaluation des Choix Scientifiques et Technologiques (OPECST) – run jointly by *l'Assemblée nationale* and *le Sénat* – was meant to be such an instrument through the hearings it organizes. Its lack of means, in particular of qualified staff, limits its action. However, it is interesting to note that, in the quite polarized political system that France is living under, OPECST is a forum whose members cooperate quite easily, regardless of their political affiliations.

A new threat comes from the requests made by some politicians, sometimes at the State level, to consider some countries as enemies and from their calls to cut ties with scientists of these countries. This could lead to a fragmented landscape concerning research agendas, when having the most global view is essential in order to develop the most pertinent ones. This is, for me, one reason to refuse this ostracism, while not being naïve about the possible use of science for political objectives.

Possible remedies are directly linked to the obstacles. Scientific communities must give more importance and attention across field structures in order to prevent the creation of walls between disciplines. Such fragmentation risks making the analysis of a question much too narrow, leading to a research agenda that lacks the breadth needed to make it truly effective. There is also a need to create spaces where the acculturation of politicians on how research really works can take place. These spaces should host events during which regular contacts between scientists and politicians become natural. The effect of such encounters on scientists, in turn, should not be underestimated, as a quality exchange between these two groups requires that they share at least a partially common approach.

A Warning in Conclusion

The society we live in is increasingly dominated by media, at the political level as well as in our private lives, with an increased capacity to shape opinions, and not necessarily on a rational basis. A resulting main worry concerns the impact of 'fake news' in relation to the issues discussed in this article. The success that some people have in manipulating opinions, often on the basis of obviously fabricated facts, has become a real threat to the development of free and objective discussions when they are badly needed in the process of establishing research agendas. I feel that the efforts scientific communities, and more broadly society at large, dedicate to understanding how this domination works is much too limited. Part of the problem stems from the fact that a lot of the 'fake news' comes from very well-organized groups of activists who do not hesitate to harass people who defend, most of the time on a scientific basis, views opposing their own. Therefore, if scientific communities want to have their voices heard, they must develop a good appreciation of the threat, in particular take more seriously the challenges to the scientific method that pop up here and there. The scientific method is what makes science what it is, and it is on this basis, with a lot of hard work, that scientific statements can be established. Yet, there is still one thing we can, and must, do as often as needed: speak up!

Reference

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