



KUNGL.
VETENSKAPS-
AKADEMIEN

THE ROYAL SWEDISH ACADEMY OF SCIENCES

RESEARCH POLICY PLATFORM

Research policy platform the Royal Swedish Academy of Sciences

TABLE OF CONTENT

1.	Primary message	1
2.	Foundation	1
3.	The intellectual conditions for knowledge development	1
3.1.	Variation and basic requirements in science	1
3.2.	The importance of curiosity-driven research and basic research	2
3.3.	The limitations of scientific freedom	3
3.4.	How much public research funding should go to curiosity-driven research?	3
4.	The institutional conditions for scientific quality	3
4.1.	The size of and the relationship between internal and external funding	4
4.2.	Rewards system, evaluation of science and career paths	4
4.3.	Career paths	5
4.4.	Infrastructure	5
5.	Third stream activities, communication, and the implementation of knowledge	5
5.1.	Third stream activities	5
5.2.	Communication	6
5.3.	Implementation	6

1. Primary message

The Royal Swedish Academy of Science's aim is that Sweden's research policies will promote scientific research's overarching need for

- objectivity and expertise
- long-term thinking
- freedom in the choice of issues, methods and forms of communication
- cooperation and mobility in accordance with the needs of research and without regard for national borders, ethnic origin, gender, or other circumstances of no relevance to science
- guaranteed and substantial space for basic research

2. Foundation

The position of the Academy research policy rests on the two mainstays that form the Academy's mission statement: *to promote the sciences and strengthen their influence in society*. On the one hand, this means that scientific research must be assured of the time, resources and autonomy necessary for achieving reliable and useful results. On the other hand, it must actively seek out channels for both the societal dissemination of its results and for the mutual exchange of scientific results and information with interested, and potentially interested, parties outside academia. The Academy plays an active role as an independent actor in promoting the balanced development of both these aspects of the scientific task. The Academy works to encourage decision-makers to respect the need for this balance and to ensure it has a solid empirical basis for its research policy measures.

The intellectual (2) and the institutional (3) conditions for the development of scientific knowledge and its communication and implementation 4) are discussed below.

3. The intellectual conditions for knowledge development

3.1. Variation and basic requirements in science

Scientific research is a strongly dynamic activity. It is conducted with varying aims and in many different organisations, the vast majority of which are run by private business and, to a lesser extent, by publicly-funded bodies. It includes everything from purely theoretical research, to theoretically-run empirical studies, to purely empirical research with no pronounced theoretical focus. The Academy has reason to work for the ideas of its mission statement in all these areas of scientific activity, while we also have a particular responsibility for academically-based and curiosity-driven basic research.

3.2. The importance of curiosity-driven research and basic research

Curiosity-driven research generally means basic or applied research that arises on the initiative of a researcher or research group; it is not commissioned or run on the basis of a decision from any external political, commercial or other organisation, or from anyone in a leading administrative position in academia. Here, *basic research* means curiosity-driven research that is primarily motivated by an interest in knowledge and not primarily by the requirements of applications outside of science. It is of vital importance to scientific quality, as well as for societal development in general, that there is a recognised place for basic research, as well as a substantial and reliable allocation of resources. There are several reasons for this.

One reason is that societal development and the innumerable decisions that are necessary for its progress benefit from being based on real knowledge and are disadvantaged by myths or wishful thinking. One essential condition if knowledge development is to also live up to the highest possible level of objectivity is that, as far as possible, researchers can conduct their activities without having to consider what conclusions various societal stakeholders would like them to come to. If research is permitted to be curiosity-driven, it is easier for researchers to refrain from taking such extraneous considerations into account.

Another reason is that a well-functioning society needs to be prepared to encounter both predicted and as yet unpredicted problems, not just in the immediate future but also in one that is more distant. Long-term active research is a prerequisite for this preparedness; it is the counterpoint to the ever-present impulse towards short-term responses to contemporary events, which weakens preparations for coping with future societal problems. Governing authorities have a legitimate need to promote research into already identified societal problems, but should generally also strongly limit their desire to control research, particularly towards overly short-term issues, and instead recognise the positive significance of scientific activities for which societal importance cannot yet always be identified.

All types of research are needed, not only curiosity-driven basic research, but also scientific activities with a more short-term effect, perhaps aiming to find a practical new solution to a technical or institutional problem. However, basic research has been demonstrated to have a special position because it is a vital foundation, and a requirement, for other types of research and thus for the applications from which people may eventually benefit. Despite basic research often leading to applied research of great economic value, it is rarely financed by private business as it is not expected to provide short-term financial gains. Basic research is thus critically dependent on adequate funding from the public sector.

Political, commercial, and other decisions, and their consequences, need to be objectively and critically reviewed. This is possible in a democratic society, as well as when the size and overall allocation of public resources to research is the result of political decisions. Such a society has much to gain from the existence of a critical knowledge sector, one that is not expected to be accommodating of current norms and thus does not take political or other societal desires as the foundation of the search for scientific knowledge.

3.3. The limitations of scientific freedom

Demands for a guaranteed place for curiosity-driven research mean that external parties must largely refrain from deciding what researchers should do. However, this does not prevent the state from having a legitimate responsibility for limiting scientific activities that expose people, animals and other living things to unacceptable stresses.

In addition to these types of limitations, researchers must continually have open discussions about how to approach research for which the *results* are assumed to have potentially harmful consequences. The outcome of such discussions may be that researchers decide to stop or redirect their planned research. In these cases, such decisions should be taken by the researchers themselves and not by politicians, because they may well be tempted to prevent research for ideological reasons.

3.4. How much public research funding should go to curiosity-driven research?

The majority of research at Sweden's higher education institutions should be curiosity driven. However, it is not possible to provide a precise, quantifiable answer to what proportion of public research funding should be allocated to curiosity-driven research. However, the Academy should continually monitor resources for curiosity-driven research so they are protected from exploitation by the state as a reserve for acute research purposes. This risk is always present, because politics and business have strong interests in using Sweden's research facilities for their specific wishes. Such exploitation leads to basic research gradually receiving a reduced share of public research funding, something that the Academy should be aware of and seek to prevent. There is also a great risk that research evaluations that only use quantitative algorithms based on the number of publications, number of research qualifications, or the amount of external funding, will lead to a reduction in resources for curiosity-driven research.

4. The institutional conditions for scientific quality

The institutional conditions for scientific quality include issues regarding universities' relationships with other parties, such as external research financiers, the system of rewards and evaluation that is used to promote high quality knowledge development, and researchers' career paths.

4.1. The size of and the relationship between internal and external funding

There must be a balance between universities' need for strategic planning and their obligation to take long-term responsibility for their staff, and the need for broad national competition for research funding. The system must safeguard the scientific freedom of individual researchers, as well as defending scientific quality against the risk of local bias. One leads to a developed tenure-track system and clear responsibility for the salaries of employed researchers, while the other requires a developed system of external funding.

This balance must be established while considering the need for scientific quality and autonomy, renewal and long-term thinking. The Academy should adapt its recommendations according to how institutional and other conditions change, and should therefore refrain from definitively establishing the actual proportions of direct funding to faculties and indirect funding via external financiers. In addition, requirements vary between different sciences, and sometimes external financiers' demands for match-funding tend to eat away at already slim faculty funding.

4.2. Rewards system, evaluation of science and career paths

Scientific resources should be allocated according to the qualifications of those applying for research funding and the scientific potential of their research ideas, and must not be awarded on the basis of other considerations. This is the best way to achieve the societal aims of science.

However, it is also important to avoid a large and unmotivated collection of resources among the very highest ranked researchers at the expense of underfunding other highly qualified researchers. The Academy works to promote a merit-based and rational allocation of research resources.

A system that promotes quality should welcome and reward research that provides significant renewal, as well as research that systematically tests previous studies and results. Adjustments to the reward system should be used to achieve and maintain such a balance. National scientific evaluation systems with consequences for the allocation of research resources should be used if there is good reason to believe that:

- those on the macro level contribute to increasing the quality of scientific research
- the marginal effects of using them are of an appropriate size when compared to the effects of the battery of resource-influencing international and national quality evaluations that are already in use
- their cost, in terms of research that must be sacrificed, is reasonably low

the Academy should actively review whether these conditions appear to be fulfilled and, where necessary, advise against their use.

4.3. Career paths

In a merit-based research system, in which scientific qualifications decide who succeeds, not nationality, gender, or age, etc., researchers should be given a suitable amount of time to further their development and their career path through the system.

Scientific development benefits from the long-term build-up of specific expertise in the form of discipline-specific activities, but it benefits from researchers being exposed to influences from a range of directions. The solution to a scientific problem can sometimes be searched for and found outside one's own sphere, discipline, or university. The same applies to the occurrence of new questions and ideas. This is why mobility has great value, as it entails both a move to an adjacent new discipline and a visit to a closely-related or identical discipline far away. Familiarity with new ways of thinking and new technology contribute to the cross-fertilisation of research units and research fields. Academic migration is beneficial to the development of science; physical transfers are a powerful instrument for this purpose, but with contemporary electronic aids it can sometimes be achieved without such a transfer. Both these should be encouraged and supported by the state.

4.4. Infrastructure

Research infrastructures are there to benefit research and not for their own sake. It is therefore vital to ensure that research and these infrastructures develop as part of a balanced partnership, so that excessive supply or demand does not arise in one or the other of these activities. On the one hand, conducting research requires access to libraries, databases and experimental facilities. On the other hand, researchers must have adequate research funding to be able to use these infrastructures. Otherwise we risk ending up in a situation in which the resources for research and infrastructures do not match up. The politicians responsible for this have a duty to calibrate their efforts to avoid such irrational and expensive misalignments. To make infrastructures as accessible as possible over time, they should also design legislation that allows permission to be given for the use of databases and suchlike for a range of purposes.

5. Third stream activities, communication, and the implementation of knowledge

5.1. Third stream activities

On the one hand, academia needs to be assured of academic freedom and opportunities for autonomous intradisciplinary quality reviews, to bring about

the right conditions for the long-term search for truth. This requires some degree of separation from the world outside academia. On the other hand, academia must make connections with this world to communicate its results, to receive criticism and inspiration for continued research. The latter actualises third stream activities between universities and other areas of society at various levels and at different stages. Third stream activities must be organised in a way that maintains universities' credibility as independent institutions for knowledge development. If researchers become too isolated they risk being perceived as if they only exist for their own sakes, cutting them off from many valuable influences. However, if they cultivate links that are too close, they may be enticed to serve special interests instead of independently searching for truth. In other words, to maintain and strengthen its attraction and utility in society, the world of research must be discerning in its interactions. The state should therefore refrain from using reward systems that solely reward a maximum level of third stream activities.

5.2. Communication

The Academy works to strengthen the influence of the sciences in society. This can be done in many different ways and should use the appropriate means to focus on various sectors of society, on the relevant politicians, and on other citizens.

The Academy should be proactive in a range of ways. It should conduct active dialogue with politicians in its striving to provide a scientific basis for political decisions. The primary form of action is to provide a neutral basis for these political decisions, but it is sometimes necessary for the Academy to demonstrate the potential consequences of possible decisions or, in some cases, even warn of the consequences.

The Academy should also draw the attention of decision-makers and communicators to the actual effects of scientific communication and aim that, as far as possible, it produces the desired effects, instead of reinforcing the misapprehensions that we wish to remove.

5.3. Implementation

Researchers make discoveries, clarify connections and invent things, or provide the foundation for inventions. Conversely, various inventions also offer new instruments for the continued development of basic research. To the extent that scientific progress is implemented in society, this implementation is transformed and becomes innovation, whether it be technical, institutional or something else. The Academy should strive to broaden the outside world's perception of what innovation entails, and emphasise the value of the fruitful allocation of work between research and innovation.

The process of moving from research to implementation varies in how long it takes. Sometimes it is very rapid, but sometimes it can take decades or more.

The Academy should work to help society and the political sector to accept this fact, so that those in positions of responsibility show patience and understand that the process of transformation must take the time it takes.

Established by the Royal Swedish Academy of Sciences at the General Meeting
2017-04-12

The Royal Swedish Academy of Sciences, founded in 1739, is an independent organisation whose overall objective is to promote the sciences and strengthen their influence in society. The Academy takes special responsibility for the natural sciences and mathematics, but endeavors to promote the exchange of ideas between various disciplines.