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Response to the public consultation on Science 2.0: science in transition

Universities Denmark welcomes the opportunity to reflect upon the phenomenon of Science 2.0, as it is most relevant to discuss how researchers, research institutions, national governments and international institutions address the science evolution labelled as Science 2.0. It is also necessary to address a number of the opportunities, issues and concerns this evolution brings about.

Universities Denmark recommends that the public consultation on science 2.0 leads to further discussions on this subject. It would be useful to ensure wide participation on an international level in such discussions. It is important to involve the research communities in these discussions in order to establish a sustainable and legitimate basis for the development of the future research landscape. On a national level, Universities Denmark expects to be included in discussions on policy measures needed in relation to science 2.0.

Universities Denmark has forwarded the questionnaire from the European Commission to the eight member universities; University of Copenhagen, Aarhus University, University of Southern Denmark, Roskilde University, Aalborg University, Technical University of Denmark, Copenhagen Business School and IT University of Copenhagen.

As the Danish universities have replied to the questionnaire individually – with a copy forwarded to Universities Denmark – we have chosen not to answer the online questionnaire, but to highlight certain themes of importance for ongoing and future discussions.

Engagement of citizens in science and responsiveness to public demands

The ideal of democratization and citizen engagement is important and challenging. A greater involvement of citizens in science can help reconnect science and society, and in this sense public demand for faster solutions to societal challenges is a driver for greater citizen involvement. User-driven research can be a step towards inviting citizens into the world of research. However, it also poses a fundamental challenge to the organization and the freedom of university-based research.

Crowd funding might be a way to create a greater awareness and interest in the public about scientific possibilities and results. However, it is important to note the limitations of crowd funding. It should not be an important funding source for research, as it will leave most research communities without sufficient funding, freedom, stability and commitment needed to support scientific breakthroughs that often come from many years of basic research. It is dangerous to go down a path where research activities are dictated by the interest of the general public.

Open access to publications and data - and faster sharing of research results

Universities Denmark welcomes the emphasis on open science, i.e. open access to publications and research data, and the opportunities yielded by new modes of publication and information search. Still, it is important to stress that the expansion of access and opportunities must be accompanied by increased information literacy within the scholarly community and academic teaching environments.

A greater degree of openness when it comes to research methods and ideas can ensure that research related challenges are solved at an earlier stage, and it might be easier to identify research projects heading into a dead end. The reuse of data can also increase efficiency as improved sharing of data will lead to easier replication, earlier falsification and thus increased confidence in the quality of data.

Better access to data will also make it possible to do research based on bigger data pools. This will make it easier to pose new research questions, generate research based evidence and ensure subsequent application. At the same time, increased sharing of data will limit the amount of redundant data gathering. This will ensure better value for money by avoiding duplication and accelerating research processes.

Increased sharing of data can also create platforms for cross-disciplinary collaboration. This will enable researchers to address societal challenges in more depth and with different scientific approaches. It can also make it easier to involve external stakeholders, including private enterprises, interest groups, NGOs and public authorities.

It would be beneficial to look into how international, national and institutional policies can support researchers in the process towards open access to their research. This could include legislation, strategies and instructions, depending on the steps needed. At the same time, public support to research infrastructure that makes data easily accessible would be beneficial for achieving the full potential in this area. Further discussions with relevant stakeholders are of course paramount before any policy measures are taken.

The use of big data – a few things to keep in mind

The use of big data and IT-based research tools has the potential for great scientific breakthroughs, generating important scientific insights and addressing the great challenges in society. At the same time the use of big data raises a number of questions relating to data quality and data standards, regulation, economic concerns and consideration to questions on ethics and privacy.

For example, it is essential to balance the need for high quality data – and the development of proper data standards – and the need for data openness which is the very core in Science 2.0. Data protection is another important issue when it comes to avoiding manipulation of shared data as well as the protection of misuse of personal data. It is essential to find the right balance between the concerns on data protection and the need for open access to research data for research purposes. When data is shared across borders, differences in national legislation might be a further complication.

When it comes to issues relating to ethics and privacy, potential concerns about big data research relate to the use of informed consent. This is especially important in medical research where it is essential to balance the need for open data and the individual's rights to privacy. The individual might have given consent to the use of personal data for a specific medical research project, but it later turns out, that the data can be very relevant for other research projects as well. In this case it is important to have proportionate mechanisms that protect the individual's rights to privacy while also meeting the needs for scientific research.

Intellectual rights might be an issue where researchers, research institutions and private enterprises need to address ways to combine greater access to data with the possibilities of using research based results in a commercial context. Private enterprises might chose to keep research projects in-house if they cannot obtain exclusive rights to results from collaborative research done with public-funded research institutions. This is especially the case when it comes to applied research where the project might lead to a patent application.

Additional measures of research quality and impact

Universities Denmark welcomes the discussion on new measures of research quality and impact – including measures of non-economic impact. Any introduction of supplementing metrics and alternative reputation systems needs to be followed by a greater public recognition of these systems for these to have effect.

However, it is very important that we do not forget or quit the conventional and well established metrics. The recent focus on bibliometric impact has forced researchers across disciplines to become more explicit about quality standards, and it has led to a strong internationalization of research publication. We need to keep a strong focus on excellence as determined by peer-review.

Publication of peer-reviewed paper is the main criterion for recruitment and promotion of researchers, but data sharing and early communication of results could be other criteria to include in career progression and reward systems – along with criteria relating to collaboration with industry and introduction of new elements in research-based teaching.

It is important to note that any steps taken towards reforms in the assessment of research quality or scientific rewarding systems as well as the development of new impact measures are based on a substantial debate between researchers, research institutions, research funding agencies as well a policy makers. This is an area where

there is a need for an international consensus between all stakeholders in order to ensure the mobility of researchers across borders.

Need for policies

There is need for further discussions on policies that might encourage the up-take of new science practices. Open Access to publications and research data is one of the key areas where policies – international, national or institutional – might be beneficial. Sufficient funding for research infrastructure is another important issue, as the establishment of relevant infrastructure enabling data-intensive science demands considerable costs. At the same time, research infrastructure is essential to achieve the full potential of Science 2.0. On the same note, there is a general need for more public funding to support new ways of doing research and disseminating results.

Universities Denmark also recommends extensive analysis of legal constraints that might hinder the uptake of Science 2.0 activities. This includes an analysis on how data protection legislation affects big data research, cross-national data sharing and the uptake of new research projects – especially within medical and health research. The national governments and the European Commission need to ensure that the current framework conditions support the uptake of Science 2.0 activities, including the scientific sharing of data across borders.

A further discussion of new metrics, quality assessment of research and alternative reputation system is needed before any policy measures are taken. University Denmark looks forward to be engaged in these and other Science 2.0 related discussions – on a national and European level.

Yours sincerely

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Representative of Universities Denmark on European research policy

About Universities Denmark

Universities Denmark is the organization of the eight Danish universities to enhance their cooperation, visibility and impact.

Universities Denmark works to ensure that its members have the best possible conditions for shouldering their responsibility towards research, research-based education and dissemination of knowledge. University management and staff convene at Universities Denmark to discuss issues of common interest, to take joint initiatives, and to communicate with politicians, ministries and partners.

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