

On the need for a global academic internet platform DRAFT

Nadja Kutz*

February 26, 2008

Keywords: science, communication, economics, global

Abstract

The article collects arguments for the necessity of a global academic internet platform, which is organized as a kind of “global scientific parliament”. With such a platform educational and research institutions will have a direct mean for communicating scientific results, as well as a mean for representing academia and scientific life in the public.

1 Academic communication, representation and political processes

1.1 Academic communication and its societal representation

In the last years internet communication has taken a leading role in overall societal life. This holds not only true for the western world, but is more and more also evident on a global level.

New forms of social networking and social communities grew within no time, partially furthered by networking tools, such as wiki’s, blogs, cvs repositories, commercial networking sites (e.g. myspace, facebook, xing) or other forms of community forming platforms reaching from online gaming platforms like world of warcraft, over environments such as second life, and online learning platforms to customer services of online stores.

*email: nadja@daytar.de

Political life has partially merged into this process. Every major political party has at least a website. Political leaders have their own website. International organisations have their websites etc. Political messages are distributed not only via custom media, like newspapers, TV stations but more and more often via politically colored blogs or directly on media such as youtube. Political communication platforms such as the World Economic Forum [WeFo], Fora.tv etc. provide meeting and information spaces.

However academic life, which had online networking tools long before the internet and whose networking tools (like the html format, server architecture etc) provided the grounds for the current boom takes an astonishingly hidden role in this development.

Universities of course have their own website. Moreover a great deal of academic life takes place online. Online registrations, augmented learning, student networks, research overviews, publication lists, lecture notes etc are almost standard at every bigger university. Moreover university members take part in investigations or provide information for foundations and political and economic institutions (like the IPCC) and thus they play a strong role in the political communication process. However all these contributions are rather hidden. Even in cases where the participation of academic members is emphasized these are usually mentioned in diffuse terms like “leading climate scientists” or “experts in genetic engineering”.

Another important hidden role of academia is the contribution to knowledge accumulation within the internet. This is not only provided via the university portals, but by the participation of university members in collaborative environments such as wikipedia.

In stark contrast to this there is an often strong neglectance of academia and educational institutions in politics. This neglectance takes on various forms. It may be as direct as budget cuts for research and educational institutions or it may be more subtle with methods reaching from restraining the autonomy of universities, interference of politics in academic processes with ideas like “elite formation” to concrete structural decisions like employment and funding regulations.

These political measurements take usually place on a national basis, although research is highly international.

The international organizations which are devoted to represent educational institutions like the UNESCO provide informations on educational topics, in part also on research content, they provide tools for collaborations, however they are mediators, moreover their mediating role is usually limited, which results e.g. in predefined priorities.

Similar things hold true for Science organizations, i.e. they represent scientific life to a certain degree and mediate between academia and society.

This role is important however not exhaustive enough.

In particular the “weakness” of science organisations to represent educational institutions has a structural reason. On one hand it is the relatively small organisational size (like the UNESCO Sciences Sector has about 200 staff members (which is small if you are looking for a direct addressee to set up on a science related question) on the other hand it is the very role as a mediator which diminishes the influence of a science organization.

The above should serve as a fast explanation that there is and why there is a certain lack of a direct active representation of academia and academic questions in societal life. Such a representational gap could -at least in part- be filled by an official academic electronic platform, which is directly run by all (or almost all) higher-educational institutions, i.e. universities in the world.

This excludes many good thinkers and artists but considering only university members makes the authentication and organization easier. Last not least the system of universities spans a global net with a rather (emphasis on: rather) high neutrality towards cultural and gender sensibilities, a huge expertise and a good access to local administrations.

1.2 Academic communication and political processes

Besides possibly filling a representational gap a “science parliament” could possibly emphasize its role as a global consultant. The purpose of this section is firstly to briefly recall the structural sensitivity of political systems and secondly to briefly recall the role of consultants in political systems. A profound political analysis is definitely beyond the scope of this article. The reminder should merely serve as a motivation why a science parliament could act as a consultant.

Democratic systems can be very sensitive to rather subtle organisational differences such as between representative democracy, direct democracy, between voting systems, concerning control of power (legislative, executive, jurisdiction) a.s.o. As an example one can for example compare the Weimar republic and the current German democratic system. It is more or less undisputed that the instability of the Weimar republic were partially due to its democratic organisational structures. Of course this has to be seen in context with the historical circumstances, but as a matter of fact the Weimar republic saw 20 cabinet changes in 14 years, whereas the current and former western Bundesrepublik of Germany had 21 changes of government in about 58 years.

Another interesting point when looking at democracies and their representational character is the societal and psychological origin of politicians.

For most democratic systems the societal mixture of politicians does not mirror the societal mixture of the corresponding society. A famous example for the case of Germany is the high percentage of lawyers in the German government (which is apparently mostly due to the so-called jurist privilege) [DaBu].

Psychological processes which are involved with raising to and staying in political power within a democratic system are quite complicated. A politician has to be stress resistant, stable or at least emanating stability, resistant to intrigues, be able to make fast and far reaching decisions, which can have vast implications, a politician has to be responsible etc. In short: a politician is a certain kind of a human. This implies that an average of politicians would very probably act quite differently than an average of the overall population, which has its advantages and disadvantages. Group dynamics and for example the above mentioned confirmation bias are adding another psychological component.

Another wellknown fact is that the concrete paths politicians choose in their political daily life are often to a great extent informed by consultants and lobbyists, which are mostly representing economic forces.

It makes sense to have consultants - a politician just does not have the time to dig through all the details, which are often needed for a political decision. However as outlined above the choice of consultants seems to be a rather obscure and often quite psychological issue. It is usually not very representative.

This is an obvious violation of the idea of a democracy - given that there is a democracy in a country.

According to the so-called third Transformation Index of the Bertelsmann foundation:

Despite the continuing worldwide economic growth of the past few years, mass poverty remains the central problem in most developing countries, and the majority of people have no lasting share in this prosperity. And although the number of governments determined by free elections is growing, many people are still excluded from political decision-making or are actively denied other political and civil rights. This is the sobering conclusion reached by the third Transformation Index (BTI), an international comparative study of 125 developing and transition countries.. . [BTI08]

Moreover according to Mr. Janning, globalization expert of the Bertelsmann Foundation:

”From the global perspective, advancing globalization is producing greater overall growth and prosperity, but not in a fair or sustainable way. The positive effects of globalization are not benefiting the majority of people and it is not sustainable for the future. The failure, but also the solution to these problems lies in the reform capability at state and government level.”

Summarizing - next to its role of being a representative of the global scientific community, as had been outlined in the preceding section, the science platform could act as a more or less neutrally, transparently and globally acting consultant. It may saveguard politicians if they have to make controversial desicions, which are facing or will face manhood soon. It could empower the UN to enforce desicions against local warlords. Thus it could change the political landscape without making apriori sensitive structural changes at the political systems themselves, which does not exclude that one keeps thinking about them. Moreover it is in principle possible to use the “science parliament” for informing structural changes such as adaptive management etc.

2 Scientific Methods and the Validation of Scientific Questions

2.1 Scientific method, knowledge accumulation

In this section I would like to briefly discuss the role of the scientific method and the validation of scientific questions mainly at the example of math, computer science and physics.

The purpose of this is to explain to a nonscientific audience why the desicion process in science is different from that in politics and society. However the procedure of how “the” scientific method works gives us also indications of how the proposed internet platform may work.

Due to the logical nature of math (the language for physics) the evaluation of a given scientific question or hypothesis is relatively straightforward.

In particular mathematics provides even sometimes notions on wether a question is solvable at all, on how complex a question may be or on how random an answer is.

Mathematical assertions can be *checked for logical consistency*. Interestingly the computer has become more and more important in this in the last years.

Assertions in physics can to a great extent be *checked by measurements and observations*. Physical models/hypothesis/theories (i.e. the mathematical description of physical entities) have to be validated in accordance with these measurements/observations and in accordance with the mathematics describing them.

The whole process must be objective so that the scientist does not bias the interpretation of the results, which includes that the measurements/observations must be in principle replicable in order to verify them.

In short there is a quite established widely accepted method for checking hypothesis' in mathematics and physics, which applies to a great extent also to other sciences like biology and chemistry and partially also to humanities, like social sciences and also to economics.

The way however how to set up a hypothesis and the question what questions should be asked is usually not straightforward, it is a process which involves imagination, intuition and sometimes also scientific fashions.

2.2 Scientific method, review of results

The review/verification process of a result includes various formal steps including the prepublication of results, which reaches from internal discussions with trusted experts to putting them on an electronic archive system as so-called e-prints.

Lately there had been some examples, where -mostly well established faculty members- put drafts of their scientific results out for discussion on websites, as a kind of prepublication. However this presupposes that the work had reached a certain stage of maturity and that the authors are prepared for discussions.

The archive *arXiv.org*, which was founded in 1991 takes a prominent role in that, i.e here almost all math and physics publications are freely prepublished and sorted in a content-classification system.

The final step of a publication is then usually done in a peer reviewed journal, where peer review means that the work is independently reviewed by usually at least 2 anonymous experts (the author is usually not anonymous). The anonymity guarantees to a certain degree that the work is investigated solely in terms of content and not in terms of things like personal sympathy. Whereas it should be remarked that it is quite unusual that "negative results", i.e. cases where research lead e.g. to no result are published at all, although the description of these cases could constitute valuable information.

This is (very) roughly what people mean by the scientific method of knowledge acquisition (please see also the wikipedia portal on "scientific method"). In particular this method has been designed to ensure objec-

tivity and designed to avoid in particular biases, like the confirmation bias, whereby we seek and find confirmatory evidence in support of already existing beliefs and ignore or reinterpret disconfirmatory evidence [MSh06].

But as mentioned before “the” scientific method is not a fixed recipe. It is an ongoing cycle, constantly developing more useful, accurate and comprehensive models, hypothesis and methods.

By the above it is also clear that this system can have failures, in particular the sensitivity of the system to funding and rewards is a delicate issue.

2.3 Scientific methods, failures, scientific integrity

The purpose of this section is to describe the sensitivity of the scientific method with respect to funding in order to provide an insight in possible vulnerabilities of the platform.

The sensitivity of the scientific method to funding starts with the choice of questions. If research has to lead to certain results in a predefined way (like via timelines in a research proposal) then questions will be made with respect to whether this can be achieved at all or not, which implies that questions which are presumably too hard to solve will be left out in such proposals. This holds also true for frequent evaluations, where usually only “positive” and “final” achievements are awarded (which are in terms of science funding often counted as number of publications and number of patents), i.e. again - in terms of evaluation you better choose a subject which has some chance of being successful. Hence the shorter and more limited the proposal/evaluation cycles are, the more results will be “small” results.

Small results or “almost fully satisfying” results can sometimes be useful e.g. in industrial mathematics, where an intelligent mathematical optimization can do sometimes wonders and may already be a sufficient progress considering the invested time and money. But think of how long it took to prove the Fermat conjecture (about 400 years) and imagine how many people would try to apply for a grant proposal in a similar case.

Funding problems can also work as a test case for scientific integrity, i.e. whether the principles of the scientific method are violated. This needs no further explanation - also scientists may be corrupt. However the scientific methods makes corruption much harder than in ordinary life. So funding problems result usually rather in unpleasant interactions among scientists than in wrong assertions. However funding policies may distort the overall picture, like if you look for evidence only in a certain direction then this may lead to insufficient and even wrong conclusions.

Despite the usually high integrity of scientists the problem of scientific integrity has to be mentioned -especially in context of industry/politically

funded expertises. The more one individual or a small research group is dependent on certain funds the higher is the danger of violation of scientific integrity. Likewise this indicates that the more diverse and the higher the number of involved groups in the discussion of a scientific question is, the more integrity can be expected. Furthermore the more open the process of developing a solution is the more peer review will automatically ensure more integrity. Again here the dependence on funding/rewards may result in fears that colleagues snatch away intermediate results etc. and thus in hiding the work.

For the case of the electronic platform this implies firstly that the running expenses of the platform has to be made by the universities alone, whether they get reimbursed by an overall higher budget is another question. An initial extra fundraise to install the technics, etc. however may be useful. Moreover not much direct research, which depends on fundings should be involved with the platform (too expensive), but *available information should be rather gathered* for an evaluation process. Secondly, discussions should involve as many work groups as sensible. The more wide-spread and more diverse the groups the more it will also be hard for lobbyists to influence. Scientific discussion should be as open as possible. However it may be necessary to hide work and contributors for preventing lobbyism or for other reasons. Experiences with information blockades after nuclear accidents are an example, where e.g. politics interfered with the pure demand for scientific information. Thirdly the sort of questions to be addressed has to be of public interest, where public may include the scientific public only. Particular benefits of companies have to be avoided or at least discussed openly, as they probably can't be avoided sometimes, but this holds true in general for scientific results.

2.4 Further Implications for an electronic platform

There is another aspect one should mention. The scientific method deals with scientific questions. Often the scientific questions to be discussed are in strong relation to e.g. economical, juridical and ethical questions. A natural-scientific judgement which involved the scientific method may need to be evaluated or juxtaposed in terms of considerations with respect to (economic, political) realizability and ethics. An example: The use of genetically modified plants may impose severe health risks. We may come the point where one has to use genetically modified plants in order to feed the planet. (it is not necessary up to now I think!). So this question has to be discussed in conjunction with these constraints or at least juxtaposed to them. The humanities sections of universities are a very valuable partner in doing this.

This is why the platform could also further interdisciplinarity.

2.5 A workflow proposal for the electronic platform

The general schemes of how the scientific method works gives us indications about the possible design of the proposed internet platform/network. The exact technical realization of such a platform is indeed a sensitive issue and beyond the scope of this article. Here a proposal for a general workflow scheme:

1. Define questions

The notion of the platform working as a “parliament” means that there are predefined questions. These questions come from society and science itself. Just like laws or societal questions are discussed in a parliament. So society is basically doing the “what-question-should-be-to-be-answered-search” part of the scientific method. The “parliament members” or “experts” are faculty members of universities. The parliament itself is run by universities. It would actually be good if the compilation of questions would be preprocessed and discussed by a forum which is open to everybody, just like wikipedia.

The questions which are suitable for investigation need to be stated in a precise manner, i.e. scientists may have to reformulate them or dissect them in terms of scientific validation, and economical, political and moral subquestions. The questions relevance has to be established, it has to be ensured that particularism is avoided and it has to be decided whether a question will be made into an official question and as such published on the platform.

2. Supply expertise and data

Experts need to supply data to a given official question, which means available scientific material. This presupposes an initial choice of experts, which may supervise the gathering of material and of further experts. Hence this process is similar to the work of an editor of a journal, who assigns communicating faculty and these in the turn assign referees for a work. If global experts are electronically registered and when their expertise is classified via keywords, like in the Mathematics Subject Classification [MSC] then the expert retrieval is fairly simple. However the validation of a question may not necessarily be confined to experts. Non experts could a priori have the possibility to contribute, at least by commenting and providing data. Often e.g. students are very well if not better informed and may contribute at least

for data gathering. It should be possible to invite experts from outside the university faculty especially e.g. members of research institutes.

If questions are related to issues of specific nations then it has to be decided whether this is a national or even more local question. If this is not the case it has to be decided whether there has to be a nationality balance in accordance to maybe UN proportions.

3. Formulate answers/hypothesis‘

Based on their data/expertise experts may formulate answers (hypothesis) and “prepublish” them in a “library” next to a discussion forum corresponding the question or if this is necessary assert that no hypothesis can be made, as e.g. there is not enough material etc. Depending on the question, conferences may be needed (like in the case of the climate change discussions). Here NGOs may play an important role.

4. Evaluate answers, publish them

Based on the discussion preliminary or final answers can be formulated and officially published as such. The answers can be explained via the gathered data. The presentation of the results will certainly need a good collaboration with science communicators/journalists in order to avoid communication problems like for example it happened in the report about childhood cancer in the vicinity of nuclear power plants [Rand08]

In the generic case together with the answer it should be made visible how many experts are in favour for which answer and to what extend. This is what I would call a “vote” or “poll”. It may be that experts decide that some aspects are more important than others.

The exact questions of how to poll and decide on the results has to be decided by the experts, however there could be simplified voting mechanisms. In particular simple questions could be decided to be answered via e.g. voting on multiple choice questions. This may sound crude especially in context of the careful design of the scientific method, but it may often be sufficient for certain questions or at least for intermediate decisions, like about the issue of relevance etc. For a nice introduction to voting see e.g. the AMS math awareness month website [AMS08]

Depending on the question, the vote as well as the electronic discussion of results itself must in principle bear the possibility to be made anonymous in order to safeguard the involved scientists as pointed out earlier.

5. Set timeline

A timeline for further investigations and validations has to be given next to the “answers”. It should be discussed whether and how one could adjust these to strategies like adaptive management.

So in principle the workflow of the platform is not so much different from the scientific day-to-day practise in that its workflow resembles the workflow of the scientific method. However there are differences to the day-to-day practise. I would like to emphasize some of them, as well as emphasize some other relevant points:

- The platform would collect and sort structural data from all universities worldwide and thus provide a worldwide academic network in an electronic-semantically connected way.
- Besides being an organisational framework the platform will have a task, namely to represent the global network of universities and to provide answers to scientifically difficult societal questions. The questions will come -at least in part- from society, i.e. in particular the “answering service” by such a platform will be seen as a service of academia to society.
- The amount of answers and the work which will be involved with them is freely adjustable. I.e. if universities don't have enough resources they may decide to terminate the service. Likewise if societies are not content with the service they will proceed in cutting down science budgets.
- The answers to the given questions will in principle already be existing, and not researched i.e. the answers should reflect the current scientific knowledge rather than constitute research. I.e. the main value of the platform is that experts provide and connect information and expertise, rather than that they do research. This doesn't exclude of course that this involves small short term research or that further research may be necessary (see timeline).
- The platform could be used as a call-in instrument, i.e. if scientists are concerned about certain questions, they could call in colleagues rather easily. Since everything is electronic, these calls can be simply categorized according to relevance, local connectivity etc. Thus mailing lists could be assembled very easily.
- Since the infrastructure of universities is used (computers, rooms), the cost can be kept relatively small.

- Most information which is needed for the platform is already existing, electronically available information (like lists of faculty members, e-prints, open access journals etc.). This information needs to a great extent only be connected. This is mainly a technical challenge than an organisational one. In general, organisational regulations should be held minimal and scientists should be trusted in their ability of self-control and self-organisation (given acceptable living and working conditions).

The expertise of platforms like that of the UNESCO especially with their unitwin networks [UNITWIN] or organisations like sense-about-science [SAS] and other organisations are very valuable and one should think about how to include them into the process.

3 Further possible tasks of the platform

This section is mostly intended to encourage discussion, about the organisational structures of economies and their relation to the mechanism of assigning values, which is usually called “pricing”.

An implication of this discussion is that the scientific platform could serve as a tool to inform about actual costs.

A preliminary draft of this section can be found sofar only in a note at the url: <http://www.randform.org/blog/?p=1657>.

4 Acknowledgements

I would like to thank Sabine Hossenfelder for valuable help.

References

- [AMS08] <http://www.amstat.org/mathandvoting/index.cfm?fuseaction=Main>
- [DaBu] Datenhandbuch zur Geschichte des Deutschen Bundestages : <http://www.bundestag.de/bic/dbuch/index.html> see also table in wikipedia:
http://de.wikipedia.org/wiki/Bundesregierung_%28Deutschland%29#Anteil_der_Volljuristen_in_der_Bundesregierung
- [MSC] <http://www.ams.org/msc/>

- [MSh06] Michael Shermer “The political brain” *Scientific American Magazine*. July 2006.
- [SAS] <http://www.senseaboutscience.org.uk/>
- [UNITWIN] http://portal.unesco.org/education/en/ev.php-URL_ID=41557&URL_DO=DO_TOPIC&URL_SECTION=201.html
- [BTI08] <http://www.bertelsmann-transformation-index.de/>
- [Rand08] <http://www.randform.org/blog/?p=1629>
- [WeFo] <http://www.weforum.org/en/index.htm>