Karlsruher Institut für Technologie

Beyond Knowledge Society: Scientific knowledge production, consumption and transformation

International Graduate Summer School
IUC Dubrovnvik, Croatia
September 2010, 13th – 17th

Karlsruhe Institute of Technology

Welcome to the IUC

The Inter-University Centre, founded in 1972, is an independent, autonomous academic institution with a mission to promote international co-operation between academic institutions throughout the world. Council is the policy-making and the highest governing body of the IUC. Members of Council are representatives of each Member institution. Council elects the Executive Committee and appoints the Director General, responsible for the functioning of the Centre, its academic programmes, and finances. The IUC Association is providing the legal basis for the functioning of the IUC in Croatia.

Welcome to the Old City of Dubrovnik

The 'Pearl of the Adriatic', situated on the Dalmatian coast, became an important Mediterranean sea power from the 13th century onwards. Although severely damaged by an earthquake in 1667, Dubrovnik managed to preserve its beautiful Gothic, Renaissance and Baroque churches, monasteries, palaces and fountains. Damaged again in the 1990s by armed conflict, it is now the focus of a major restoration programme co-ordinated by UNESCO.

creative commons, Michael Cavén

Agenda – Morning

	Monday, 13.09.	Tuesday, 14.09.	Wednesday, 15.09.	Thursday, 16.09.	Friday, 17.09.
9:00–10:00		Prof. Dr. Sabine Maasen *Basel University, WiFo* "Diverging reflexivities in medialized knowledge societies: the case of nano and a glance at neuro"	Prof. Dr. Armin Grunwald *KIT, ITAS* "The necessity of using future knowledge in policy advice and its problematic aspects"	Prof. Dr. Ulrike Felt *University of Vienna, Department of Social Studies of Science* "Between career and biography: Essential tensions in working and living in contemporary research"	Prof. Dr. Imre Hronszky, *University of Technology and Economics, Budapest Department of Innovation Studies and History of Technology* "Some problems of building strategic intelligence in studies on futures and strategic planning"
10:00–10:30		Coffee Break	Coffee Break	Coffee Break	Coffee Break
10: 30–11:30		Simon-Philipp Pfersdorf, *KIT, ITAS* "Shedding light on the theoretical basis of knowledge politics – Consequences for an empirical analysis"	Matthias Werner *IFZ Graz* "Changes of knowledge in public administration. An information and knowledge centered analysis of Electronic Government"	Jan Lukassen *University Bielefeld, IWT* "Re-Organising university education as instrumental science"	Final Discussion: Beyond Knowledge Society? Moderation: Gerd Schienstock Feed-back
11:30–12:30		Judith Simon *Ecole Normale Supérieure Paris, Institut Jean Nicod* "Outlining a Social Epistemology for Socio-Technical Epistemic Systems"	Günter Getzinger *IFZ Graz* "Transdisciplinary Research and Sustainable Innovations: The Case of EcoBuy Vienna"	Anna Schleisiek *KIT, ITAS* "Economic Principles and Scientific Practice"	
12:30–13:30	Registration	Break	Break	Break	Departure

Agenda – Afternoon

	Monday, 13.09.	Tuesday, 14.09.	Wednesday, 15.09.	Thursday, 16.09.	Friday, 17.09.
13:30–14:30	Prof. Dr. Gotthard Bechmann *KIT, ITAS* "Knowledge Society — The Transformation of Modern Societies"	Prof. Dr. Gerd Schienstock *IFZ Graz* "Systems of innovation: knowledge transformation, knowledge capabilities, conflict and path dependency"	Prof. Dr. Andoni Ibarra *University of the Basque Country, Bilbao* "New subjects for new forms of producing knowledge"	Prof. Dr. Nico Stehr *Zeppelin University Friedrichshafen* „Knowledge, Expertise and Democracy"	
14:30–15:00	Coffee Break	Coffee Break	Coffee Break	Coffee Break	
15:00–16:00	Alexa Maria Kunz *KIT, Institute of Sociology* Constanze Scherz *KIT, ITAS* „Beyond knowledge society? Reflections on professions and policy advice"	Christian Dieckhoff *KIT, ITAS* "The production of future knowledge – an empirical analysis of scenario construction processes in the border zone of science and politics"	Michael Sondermann *The Institute for Research Information and Quality Assurance, Bonn* "Does spatial proximity in knowledge production matter?"	David Kaldewey *University Bielefeld, IWT* "Beyond Knowledge Society: Differentiation or De-Differentiation?"	
16:00–17:00	Forecast on the sessions and topics	Diego Compagna & Stefan Derpmann *Duisburg-Essen University* „The Scenario Perspective: Approaching the agency of (non)intended-emergent-knowledge"	Julieta Barrenechea *University of the Basque Country, Bilbao* "Evaluation of scientific activity: relevant connectivity and relational quality. A theoretical and methodological proposal"	Mario Kaiser *University Basel, WiFo* "Preemptive politics of the current assessment regime of (nano)-technology"	
17:00–18:00		Rik Wehrens *Erasmus MC Rotterdam, Dept. of Health Policy and Management* "Beyond Knowledge Society: Scientific knowledge production, consumption and transformation"			
Evening	Guided tour		Joint dinner		

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From the 13th to the 17th of September 2010, the Institute for Technology Assessment and Systems Analysis (Prof. Dr. Grunwald) together with the Institute of Sociology (Prof. Dr. Pfadenhauer) is organizing a Graduate Summer School at the Inter University Centre Dubrovnik (IUC). This international conference under the scientific direction of Prof. Dr. Armin Grunwald (KIT/ITAS), Prof. Dr. Vitaly Gorokhov (Lomonossow University, Moscow) and Prof. Dr. Imre Hronszky (Technical University Budapest) on the subject of

“Beyond Knowledge Society: Scientific knowledge production, consumption and transformation”

offers doctoral candidates and young scientists the opportunity of discussing their social scientific research work with experienced scientists.

Subject

The importance of scientific knowledge has changed in the past decades. Science's cognition-oriented self-concept as a place for academic contemplation, for the art of experimentation and theory formation, which corresponded to the ideal of classical physics — and from there, set out on its triumphant advance — is now to be found in only some of the sciences. Other sciences, however, are drawn into society's decision-making processes, and are changed by them. The background of this development is that, in decision-making and organizational processes, knowledge is retrieved which is also needed for political opinion formation.
Through comprehensive research programs and new forms of organization (like, for example, the Helmholtz Association), new methods of scientific knowledge production are being firmly institutionalized. Science is called for to subject these scientific production methods to a re-evaluation, and to examine them with regard to the question, to which extent basic research should and can be societally relevant. The performance potentials of this "new" form of scientific knowledge must, for that reason, be analyzed with respect to its societal relevance, and be oriented on higher-ranking formulations of problems. Besides (1) the production of scientific knowledge, closer examination of (2) the consumption and (3) the transformation of scientific knowledge can provide an analytical framework.

(1) The production of scientific knowledge should be integrated directly into processes of economic and political decision-making, science's importance for the economy (innovations) and for politics (knowledge as decision support) is growing. Science influences the capability of these societal areas, because it not only provides explanations, but also draws up models for shaping reality, as well as decision alternatives. Conversely, the differentiation of research orientations in the economy and politics can be deemed to be an indispensable prerequisite for setting structural linkages between science and politics, resp., between science and the economy. This differentiation becomes apparent in processes of adaptation to economic principles which are taking place within the science system. This affects, above all —, but not exclusively — universities and researchinstitutions, which are going through a period of upheaval. This upheaval seems to be closely associated with the introduction of new control instruments into science.

The key issue is, which institutional and epistemic consequences this reorientation has for the core of scientific research. Our inquiry's interest is directed in particular at the context of research, at the disciplinary configuration, and at methods of quality management.

(2) The consumption of scientific knowledge is mirrored in its performance potential for political decision-making, and for economic innovations. On the one hand, the results of scientific research enter directly into advisory processes; on the other, they are generalized through a sort of expertise-oriented action, which makes their integratability into science and society at all possible. This diffusion and communication of scientific knowledge does, in fact, facilitate active reference to science, and, in this manner, improves the translatability of scientific- in societal ways of looking at problems (and vice versa). On the other hand, this sort of (possibly strategically and programmatically oriented) precautionary- and innovation research confronts scientific knowledge with its own particular challenges: New forms of knowledge develop, which, in their organizational form, no longer fit into the classical trinity of basic research, applied research, and commercialization.
The key issue is, which institutional and epistemic consequences result out of the interconnection of scientific professionalism with the necessity of political decision-making, or with research-based technical innovations. Our inquiry's interest is focussed less on science's role as a provider of information pertinent to advice and innovation, than much rather on the strategic reorientation of scientific research (accountability).

(3) The transformation of scientific knowledge addresses — as its consumption also does — the problem of embedding scientific knowledge in the various stocks of societal interpretative knowledge. Through transformation, however, societal interpretative knowledge itself, on the other hand — more than that —, is supposed to be rendered scientific. In this way, science loses a part of the "innocence" which it had propagandistically defended by means of the norm of value-freedom. Value-freedom means, among other things, the objectivity of knowledge. While science is increasingly in demand in the economy, politics, and culture, and takes on obligations in these systems, the context of scientific knowledge gains in importance. Science is forced to reflect upon the conditions and on the consequences of its own application — and it can't do this other than with the help of scientific methods.
With science's nascent reflexiveness with respect to its societal environments, its mode of legitimation also changes. The "objectivity of knowledge" is no longer alone decisive for science's prestige, but rather also science's importance and its practical benefits for its users in the various societal areas. Science in this way takes on the task of answering to political goals and to societal needs. The scientific representation of practical relationships, including forecasting, is increasingly necessary for political and societal innovations, since the secondary consequences syndrome (unintended consequences) has grown to incalculable dimensions. With the emergence of new fields of research and reflection on the societal consequences of scientific and technical development, not only new themes for science come into being, but one can definitely assume a changed societal role of scientific knowledge. The central point may be that the contingency of scientifically-gained knowledge has become conscious, and is communicated in society as a knowledge gap.
The key issue is, which institutional and epistemic consequences result out of a science system which also "makes policy" by formulating how science should be constituted which meets the changed societal demands (e.g., transdisciplinarity).Our inquiry's interest is, in the process, directed at the specific features of criteria for the validity of scientific knowledge and at their theory-guided efficacy.

The summer schools central matter of concern is to make an assessment of the changed production, consumption and transformation of knowledge — from varying disciplinary as well as varying cultural perspectives. To this end, the relevant theoretical perspectives and discourses will be introduced by experienced scientists in a first part. In a second part, the empirical and theoretical perspectives of young scientists will be presented. The objective is to gather different perspectives, to bring them to discussion, and, in this manner, to open — particularly for young scientists — an international and interdisciplinary view on this subject matter.

All information about the International Graduate Summer School can be gathered from the homepage: http://www.itas.fzk.de/v/dubrovnik/

Knowledge Society – The Transformation of Modern Societies

Modern societies have significant characteristics that need to be examined in detail in an effort to gain an understanding of the transformation of modern societies and therefore the ways such basic social changes effect the capacity of modern societies to responds to climate change impacts. One of these characteristics is paradoxically the “emancipation” of society from the existential constraints of nature which manifests itself, for example, in the decline of environmental determinism as a world view that still animated much of the discussion of the relation climate and society until the just a few decades ago. The second profound transformation is the emergence of modern society as a knowledge society.

Many influential social theorists, who have tried to capture the unique features of modern society, have emphasized the role of knowledge in social transformations. The transformative power of knowledge, for example, figures prominently in the work of Adam Smith and even of Karl Marx.

Despite obvious differences among these theories and policy proposals – differences that result from the fact that the theories and policies were devised at different times in an era of rapid social and economic change, and hence bear the marks of their different origins – some remarkable commonalities can still be found in these investigations of the social role of knowledge.

However, the knowledge referred to in these theories, and the groups of individuals that acquire influence and control with it, tend to be conceptualized rather narrowly. Perhaps paradoxically, there is a tendency to overestimate the efficacy of “objective,” technical-scientific or formal knowledge.

Most theories of modern society lack sufficient detail and scope in their conceptualization of the “knowledge” supplied; the reasons for the demand of more and more knowledge; the ways in which knowledge travels; the rapidly expanding groups of individuals in society who, in one of many ways, live of knowledge; the many forms of knowledge which are considered pragmatically useful; and the various effects which knowledge may have on social relations.

While we are unable to observe and describe future society, we might yet be able to observe what kind of structural change is taking place. We might be unable to position the event between before and after, but we are at least in the position to recognise in which respect the fundamental boundaries of existing societal structures are changing. This is precisely the goal being pursued by the theories of the information society. To this extent, they have a common underlying problem: Tackling the issue of social change due to changed communication and interaction opportunities.

The following discussion of the theories of the knowledge society attempts to provide a brief historical sketch of the theoretical investigations, at the same time aiming to focus systematically on those aspects of social development dealt with from the perspective of the information society. Any theoretical communication is at the same time also a part of social reality and the description of a change to which it itself belongs.

The necessity of using future knowledge in policy advice and its problematic aspects

It is a characteristic trait of modern societies that they increasingly draw the orientation needed for opinion formation and decision-making from debates about future developments, and less and less from existing traditions and values. Modern secular and scientized society orients itself, instead of on the past, more on wishes and hopes, but also on fears with regard to the future. The frequent discourses on sustainable development, on the Risk Society, and on the constitutive role of innovations in the modern self-understanding give evidence of this fact. Policy decisions are taken considering assumed future situations, expectations, fears, desires, concerns and hopes. This general pattern applies in particular to decisions in the context of research, technology and innovation. Policy advice in these fields, such as provided by Technology Assessment, aims at improving the scientific basis and – perhaps – rationality of the futures upon which decisions will be grounded.

However, this model of providing orientation includes severe problems, even paradoxes. Futures such as energy scenarios or hypotheses about future developments in the field of human enhancement are contested and controversial. They do not simply give orientation but are a battle field of social conflicts – and this is quite plausible. The development of futures, including conducting model-based simulations, is a value-bound process and not simply a value-neutral description of possible futures. “Futures” of any kind, also for example model-based quantitative scenarios are social constructions in which, in addition to available knowledge, suppositions that are in essence normative come into play. The high degree of uncertainty and non-knowledge about the future must be compensated by more or less plausible assumptions and by involving values, but also by implicit and ceteris paribus conditions. Such “compensations” of uncertainty are to some extent explicit but often implicit and hidden.

This diagnosis threatens the orientating function of futures hoped for. If there are - because of their speculative character - hardly any arguments for deciding “rationally” for one or the other variant, a serious problem arises. The expectations concerning futures could be mere “wishful thinking”. Even worse: If a negative utopia stands against a positive one, uncertainty and confusion could even be increased. The orientation dilemma may, therefore, be formulated in the following way: Attempts to provide orientation by reflections about future developments could even increase disorientation.

This intermediary result is fatal because it seems that there will be no chance for regaining orientation: Relying on traditional values is no longer possible because of the increased contingency, and taking the way via future communication would be impossible because of the dilemma analysed above. In the remainder of the paper I will try to remedy this fatal situation by reconsidering the role of futures in the debates searching for orientation from an epistemological point of view. As a case I will use the debate on Converging Technologies for Improving Human Performance.

The Development of the New Paradigm of the Technological Sciences in the Knowledge Society (Experience of the Teaching of the Postgraduate Students in the History and Philosophy of Science in the Russian Academy of Sciences)[1]

We are speaking about the elaboration of a practically new paradigm of scientific and technological development. From the point of view of this paradigm, it is not enough that the natural scientist treats Nature in a softer way than under conditions of classical or even non-classical paradigm. It is not enough to question Nature in a tactful manner, to pump its secrets more carefully, to utilise the obtained at any expense knowledge for the scientist's ends, not to torture it severely, driven into the torture-chamber of a scientific laboratory. He should carry out constant reflection of his scientific and technological activity, correspond his actions with Nature-under-investigation, treat it not as a lifeless object of manipulation but as a living organism. This organism can have its own opinion. It is free to act in its own way and sometimes to respond dubiously to the questions put not correctly or too brutally by the researcher or the designer. For example, to respond in emergency in the form of catastrophes to inadequate technological implementation based on too hard or ambitious scientific premise. The very object – Nature – that the scientist or the engineer tries to manipulate with (sometimes in vain), cannot exist apart from the social organism growing and paralysing on Nature. Any science and technology should work in the interests of this social organism, and they actually do. Which is why, "the object of investigation' comprises the subjects that have the right to think and act freely and whose interests definite scientific projects can touch. Experts and specialists should take into consideration these opinions and actions of free social individuals which come into the sphere of their research and projecting at the stage of preliminary assessment of the effects that the latest scientific and engineering technologies may have. In this sense, the production of scientific knowledge cannot be separated from its application, and they altogether cannot be separated from ethics of the scientist or the engineer that inevitably make new natural science socially oriented.

In the modern situation of the change of the social priorities of science and technology is important to develop by specialists also the general representations about science, technology and society. But these general representations will be too abstract without the understanding of the real history of science. The history of science can be interpreted in the different ways. That is why it is important to develop by postgraduate students the reflexive capability to interpret the history of science from the philosophical point of view. In this case the particular history of the different special branches of sciences can be represented in the case studies as different general models of the historical development of science and technology. For the development of this reflexive capability we are hold the meetings and colloquiums with the presentations and papers of the postgraduate students about the history of that branches of sciences in which they right yours dissertation. In Russia from 2006 all postgraduate students from all specialities must right the paper about the history of science and take an examination in the philosophy of science in the first school year. We have already three years praxis in the Russian Academy of Science in this direction. Such computer presentations of the history of science are very important for the development by young scientists of the capability to represent the complex scientific and technological problems in the understandable for laymen or public at large form. We propose to show in our report some of such postgraduate presentations.

1 This report is prepared for the project 09-06-00042 "Technoscience in Knowledge Society" of the Russian Foundation of Basic Research

Some problems of building strategic intelligence in studies on futures and strategic planning

Complexity and coevolutionary nature of issues is typical by now. 'Deep uncertainty' (Andy Stirling and many others/, lack of predictability is typical. Surprises repeatedly but irregularly occur because 'monstrous arrivants' arrive, 'impossibilities' realise. Futures, the set of possible future dynamics and events certainly contain surprises, the 'future' is 'open'. Beside singularities, trends emerge and stabilise surprisingly just as they may disappear the same way. By radical /or more generally: disruptive/ innovations human actors themselves make efforts that contribute to this dynamic.
Complex adaptive behaviour as rational behaviour, including anticipation of dynamics is essential. Futures assessments have to take into account not only the non-linear dynamics but, values in answering them may change too, new values emerge, old values disappear, sometimes abruptively. Openness threatens with dangers but offers opportunities too. Efforts to make radical innovations try to consciously utilise 'openness' as opportunity.
Rationality of higher order than instrumental rationality is to achieve with all this. This is valid both for assessment and management. Bounding the future by providing for conditions that enable to make explanatory predictions for some issues, making foresight for extremities for others, preparation to 'mostrous arrivants' by a comprehensive preacautionary approach /involving precaution led assessment and forecare/ and trial and error efforts to domesticate them and utilise as opportunities as far as possible are essential ingredients. We have an armory of tools and different methodologies already that are developed to rationally handle the 'opennes' of 'the future'. The question arises how can we improve on this armoury?
The presentation picks up only three issues. These are the need for improving environment scanning, the correction of the scenario method by systematic utilisation of 'impossible scenarios' (Postma and Liebl), and the often neglected limits with the application of roadmapping in 'deeply uncertain' situations.
With trials to looking for signals the intention of the presentation is to put the finger on the controversial nature of the different scanning appoaches. Extending the perspective of scenario building by including looking for 'impossible scenarios' is to overcome some methodological shortage of mainstream scenario building, by criticising the so-called plausibility requirement. At assessing roadmapping the first critical aim is exploring the limits to a method that was originally introduced for prognostisable issues. Secondly, the presentation devotes itself to the special role of roadmap construction as practical actor to help turning strategic visions as expectations into self-realising, self-fulfilling endeavours. In deeply uncertain situations positive expectations for the realisability of visions by outlining roadmaps become constitutive part in binding some alternative and take part in strategic alignment around some vision. Setting strategic roadmaps are especially sensitive to the conditions when they are set and accepted. There is high danger that early accepting some strategic roadmap helps to realise lock-ins. Hence, role of and responsibility for expert opinion is important. Both issues will be addressed and assessed on the case of the so-called Hydrogen economy.

Having handled some problems of methodology, at the end of the presentation I join those who start to critically question the conceptions of future in foresight and future studies and require to systematically connect methodological to ontological questions.

New subjects for new forms of producing knowledge

Epistemological realism and methodological individualism have determined the manner in which (scientific) knowledge and its production, use and transformation have been traditionally conceived. It is true that Science Studies have increasingly started to question this approach, but they still offer no viable alternative: their emphasis on the social nature of knowledge generally translates into the idea that it is the individual subject of communities, or of collectives, who produces knowledge, influenced by the institutional community context.
The presentation will analyse some of the attempts more seriously directed towards showing the community nature of the scientific endeavour, before proposing a picture of (scientific) knowledge based on non-human units of knowledge production. These units are conceived as epistemic networks shaped by a specific type of interactions, those which have relevance in knowledge production and transformation.
These networks integrate constellations of heterogeneous agents who generate their own abilities to produce, consume and transform knowledge and who participate in different networks. The presentation will conclude showing how we can accredit, validate and evaluate the (scientific) knowledge produced in these new scenarios of epistemic reticular organisations, characteristic of the knowledge societies.

Diverging reflexivities in medialized knowledge societies: the case of nano and a glance at neuro

Modern, techno-scientifically based knowledge and risk society have been accompanied by a co-evolving expansion of intellectual figures (e.g. scientific, literary, public, and agoral intellectual), forms (e.g. from expert statements to participatory arrangements) and forums (e.g. expert panels or blogs). Building on an idea by Pierre Bourdieu (1989a), intellectuality today thus presents itself as a 'think tank'; as highly intensified, diversified, only loosely interconnected, yet ongoing discursive work on framing what an emerging technology is or should be about, and where it is or should be going. NST (Nanoscience and nanotechnology) are a case in point for this variegated landscape of intellectual work.

It seems as if the neurosciences are currently introducing yet another shift. Alongside enforced efforts to democratize knowledge politics in neuroscience (e.g. "Meeting of Minds"), a new trend has been emerging that aims at proactively 'marketing' neuroscientific findings, visions, and technologies. Rather than risking open debate and controversy, this new strategy relies on lobbying through the promotion of therapeutic promises and profitable technologies – at times by communicating science to the public and reflexive exercises (cf. above).

Systems of innovation: knowledge transformation, knowledge capabilities, conflict and path dependency.

The capacity to continuously innovate has become a key competition factor in the globalizing economy. This is reflected in the concept of an innovation-mediated economy. The system of innovation approach provides a conceptual framework that is able to capture the systemic, interdependent character of innovation. It is the combined operation of a number of different factors, including organizational, institutional and cultural ones that give rise to technical and other innovations. The main interest focuses on the social fabric in which technological change and innovation are embedded.

In the presentation particular attention will be paid to the knowledge behind or in technologies and the learning behind or in innovations. Consequently an innovation system can be characterized as a system constituted by elements and relations which interact in the production, diffusion and application of new knowledge. We will interpret the innovation system as a knowledge-transforming system, including not only scientific but also other types of knowledge.

Innovations are not generated only by collective actors but by their often complex pattern of interaction. Consequently the question of governing different activity clusters in innovation systems can be seen as a key problem. In the presentation pros and cons of different governance forms including bureaucracy, market and network will be discussed. The innovation system approach can be criticized for focusing on cooperation and consent, while key aspects of social relations such conflict and power are widely ignored. In the presentation innovation systems will be analyzed as consisting of various conflict fields in which resources, interests and identity become the main objects of conflict. The conflict approach will also be applied to analyze path dependency and path creation in innovation systems.

References

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Knowledge, Expertise and Democracy

The theme that I would like to explore in my lecture concerns the multiple linkages between knowledge, power, experts, and democratic governance. I will focus on the knowledge capital side of these linkages. The common assumption is that knowledgeability in modern societies is highly stratified and tends to exclude those from political participation who lack relevant cognitive skills and knowledge. I will argue that this is neither natural nor inevitable. Thus, I would like to place the general set of questions about relations between knowledge and governance into the context of whether these linkages are co-determined by an enabling knowledgeability of modern actors. Access to and command of cognitive skills and knowledge, both of which are stratified, is at the core of my inquiry. I will explore barriers and hurdles to access to knowledge and ask: (1) is it possible to reconcile expertise and democratic governance; (2) it is conceivable to reconcile democratic participation and knowledge as a private good; (3) and finally, are the social sciences and the humanities a source for enabling knowledge?

Evaluation of scientific activity: relevant connectivity and relational quality. A theoretical and methodological proposal.

General objective: to understand the relevance of relational quality and connectivity in the evaluation of scientific activity and to suggest methodological features for such assessment.

Main hypothesis: the relevant connectivity of a research unit, centre or group is an attribute affecting the quality of its scientific activity.

Second order hypothesis:
1. Under present conditions for scientific activity, institutional experiences in evaluating scientific activity are actually paradoxical.
2. The inclusion of relational elements in assessing scientific activity is a relevant, positively performative strategy.
3. Relational conditions are susceptible to evaluation and affect the quality of scientific activity.
4. The definition of an analytic-operative concept of relational quality will facilitate the evaluation of relevant, but currently neglected, aspects of scientific activity.

The analytical approach covers the following issues:

A – From science as knowledge to science as praxis
As studies of science as a field of knowledge have become consolidated, we have been able to observe how a science as knowledge-oriented approach has evolved towards the understanding of science as praxis. Several disciplines and perspectives, including the macro-social, micro social, symbolic interactionism, ethnography and so on, converge in this approach, which, as a whole, offers an interpretation of science as a network of heterogeneous relations intelligible on several levels and scales.

B – New models in scientific practice
In science as praxis, in line with several focal points of interest, the idea is to make intelligible new forms and models of the production, distribution and consumption of scientific knowledge. Approaches referring to actual challenges facing science, for instance, posit the emergence of a post-modern system of research or the birth of a post-normal science or post-academic science, or even science oriented towards contexts of application. For its part, the preoccupation about the role of knowledge in innovation systems focuses on interactions and on the learning systems in production environments, a user-producer model, or a democratized innovation, just as the triple helix model re-conceptualizes the socio-cognitive areas shaped by university, industry and governments.
In a similar key, other authors talk about new contexts or domains on the production and distribution of knowledge, focusing on the redefinition of standards governing the evaluation and use of knowledge according to new forms of engagement between what used to be clearly differentiated environments: market, government, pure science and applied science.

C – Social relations of knowledge and quality

In network approaches, relations are associated with quality because they optimize resources and structures, help to increase control over the players' strategic uncertainties and generate processes that activate the circulation of information and knowledge; furthermore, they facilitate the spread of tacit, codified knowledge. The research in context approach associates relations with scientific quality based on features linked to the pertinence or social relevance of research. For its part, the representational approach in the philosophical studies of science promotes a reticular analysis of the social relations of knowledge and in its instrumental applications, associates quality with the identification of factors of connectivity.

The inclusive conception of quality values the capacities of non-orthodox agents or users to establish legitimate quality criteria. Quality is also linked to plural and procedural aspects, some authors proposing dialogue as the key to evaluation, others governance.

D – Evaluative paradox

Institutional experiences in evaluating scientific activity continue to give priority to the performance and achievement of individuals while promoting collaborative and network models of operation. The notion of a scientific career and merits appeals to individual, finalist achievements; these criteria need to be complemented to address the new dynamics.

Final consideration

In short, the perspectives on science as praxis coincide in acknowledging new dynamics of scientific knowledge, where the heterogeneity of the agents, logics and values involved is the key. And it is a key that dictates new theoretical and practical concerns in establishing quality criteria throughout the entire cycle of scientific activity.

In the frame of this research, we have developed a conceptual model for evaluating scientific activity defining factors and sub factors of connectivity. The model was applied in a pilot initiative to the CIC BIOgune cooperative bioscience research centre in the Basque Country, Spain. The results provide a field for theoretical and methodological reflection on the pertinence of relational quality and connectivity in the evaluation of scientific activity.

The Scenario Perspective: Approaching the agency of (non)intended – emergent – knowledge.

The focus of this abstract is the crucial role of knowledge production and the lack of certain knowledge-transfer in the participatory innovation process.
Based on the conjunction of the empirical findings in a user-centered research project with the objective of the participatory (further) development of two robot assistants for the integration in a care facility for seniors and the presumption of a boundary between the agency of entities and the material agency of knowledge, the emergent aspects in the process of innovation can be approached.
The research in a technology developing project – abovementioned case study – offers an insight in the various forms of knowledge in user-centered innovation. Moving away from a mainly traditional scheme, non-technological (users) became an innovation driver (EU 2009), increasingly accompanying the process of innovating by representing and performing their knowledge. However, the changes in representational forms of knowledge conduct to unforeseen challenges on setting up the Innovation Process and raising the question how satisfactory participation and a certain knowledge-transfer can be achieved.
By adopting the method of the Scenario-Based Design (Rosson/Carroll 2003) a user-developer exchange through the designed scenarios in this ongoing study was established and ensured. Following our findings of different agencies, the planned applications of the robots turn out to be more than just 'boundary objects' (Star/Griesemer 1989): To characterize the dynamic that the designed scenarios unfold the concept of the obligatory passage point of the Actor-Network-Theory (ANT) is quite fruitful (Callon 1986), since the ANT allows to follow the bordering effects of the agency of entities (user, developer) and the material agencies (robots, scenarios).
In the mentioned case study a knowledge transfer loop between the users (care-workers and seniors of a stationary care facility) and the developers of robot assistants was established. Based on a requirement analysis in the facility (adopting qualitative methods and including all relevant parties, e.g. the inhabitants, the care workers and the management of the facility), first scenarios were drafted. After discussing the first scenarios with the developers, and adjusting them regarding their technical feasibility, the scenarios were presented in the care facility anew and adjusted again due to the recommendations responding the needs and demands of the potential users. These adjusting loops were repeated until every party was satisfied with the planned scenarios. At this point one can finally assume that the designed scenarios fit with the socially desirable and the techni-cally possible.

At first glance the scenarios could be described as boundary objects that create a link between heterogeneous groups like seniors, care-workers and developers of robot assistants. But this concept does not fit with a distinguishing mark of the scenarios: The meaning of the scenarios as well as the objects and the action that are part of the scenarios changes constantly for all participants of the knowledge transfer loop during the whole adjusting process. A second thought could be to characterize them by taking a social constructivism perspective in mind; e.g. describing them as a bargaining field for the redefinition of approaches for different purposes (Pinch/Bijker 1999). But also this perspective misses one important attribute: By mediating through the scenarios also the purposes of the participating parties changed. Adopting the ANT framework - especially focused on the concept of translation and obligatory passage point - the agency of the scenarios could be captured properly. A major incitement for the observed reciprocal alignment between the scenarios and each different party could be described

as a stabilization strategy. This again could be described by melting some main thoughts of "Identity and Control" (White 2008) with the ANT-Inventory.
At last - to bring the humans back in as focal actors of the user-centered innovation process - the causal loop concept of the structuration theory (Giddens 1984) is able to describe how by non-intended effects of the human actors the knowledge transfer loop - which is mainly focused on the designed Scenarios - generates a durable environment for a fruitful developer-user-exchange and a stable context for practice. Therewith focusing on the practice and the processes of the human actors, putting emphasis on ´doing´ of the emerging patterns, instead of transfusing the symmetrical assumption of the ANT over the whole process, the agency should be conceptualized by a mode of temporality and in such a way as a 'dance of agency' (Pickering 1995).
By melting these different views a main result is that especially the group that should take most benefit of the developments (the seniors) is made invisible, e.g. they turn to "monsters" (Haraway 1992) and find themselves pushed in a borderland (Bowker/Star 1999).

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The production of future knowledge – an empirical analysis of scenario construction processes in the border zone of science and politics

In my paper I will present my Ph-D project, in which I investigate the practices of energy scenario construction under use of computer models in Germany. Therewith the study focuses on a core element of the practice of the scientific field of energy economic systems analysis which has internationally developed since the early 70ies emerging from military strategic systems analysis and economic policy analysis.
At least in Germany this field has established itself as the major consultant for scientific policy advice in terms of strategic energy questions and today its results – the energy scenario studies – play a crucial role for energy economic decision making and moreover for the societal self orientation regarding this topic. The field is observed as being located in the border zone of science and politics, because neither science nor politics alone are the relevant reference systems for the field. Instead both reference systems play a constituting role for the field when local standards of science and of policy advice are tried to be fulfilled at the same time.
Motivating for the Ph-D project is the circumstance that neither the claims to validity raised with the energy scenario studies nor the methodological justification of these claims through computer models are sufficiently explicated in these studies or in other publications. Obviously this lack makes it difficult for external recipients to evaluate the scenario studies in their decision making and creates at least a need for a better presentation and explanation of the results by the field itself.

But two major aspects make this an interesting object for an empirical in depth analysis from an external perspective – as conducted in the Ph-D project presented: First the described intransparency of the scenario studies can be interpreted as a symptom of the community's difficulty to arrange itself in between two diverse reference systems. Indeed the analysis shows that the practice of scenario construction is determined not only by the local standards of good science, but also highly influenced by the individual understanding of good policy advice and the resulting methodological adaptations.
Secondly already the preliminary studies showed that the two central methodological elements of the practice – the model and the scenario – are not equally understood in different scenario studies. The community itself typifies the models into a range of major categories, referring to different theoretical but also technical backgrounds. But this at least for internals explicit diversity is interfused by more implicit differences concerning the general epistemic role the models play for the individual scientific practice. The individual understanding of the scenario paradigm is even less explicated, concerning both the epistemic status of such statements and their practical realization in a study based on quantifying computer-models.

To gain insights into the complex and heterogeneous practice of scenario construction in the field of energy economic systems analysis an explorative study based on methods of qualitative social studies is conducted. In the centre of the project stand semi-structured interviews in two waves with eight experienced scientists working at different institutes of the field in Germany.

The interviews are the basis for a reconstruction of the practices on two analytical levels: On the level of practical action the whole process of generating scenario studies by using computer-models is investigated with focus on the way the models are applied and the way the numerical results are then integrated to a scenario study. On the level of interpretation it is investigated which theories, concepts, ideals etc. guide the practical process and how the numerical results are then interpreted with respect to the individual claims to validity. Additionally it is investigated under which external conditions the construction of scenarios takes place. Here a special interest lies in the question how the two different reference systems of science and politics are individually integrated.

In my paper I will focus on describing and interpreting the following central observation: The concept of the scenario is omnipresent and at least in the field of energy economic systems analysis it is accepted as the scientific concept of making statements about the future. In contrast to this stands its epistemic indecisiveness – which can at least be empirically shown for the “producers” of energy scenarios, but seems to be true for the side of the recipients as well. This contradiction leads to the question, why the diffuse concept of the scenario is nevertheless accepted as the dominant concept for political advice in the area of energy politics. I will try to answer this question by analyzing the scenario-concept as a “boundary object” in between science and politics: In form of a hypothesis I will outline that it is just the observed degree and form of indecisiveness of scenarios which allows both sides – the (scientific) producers and the (political) recipients – to interpret and accept scenarios system-specifically and therewith make the scenario concept “work”.

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Publicity of a scientist as a measure of his/her professionalism

The role of science in the modern world is increased. This fact is no longer disputed now and it is expressed by formation of notions about a knowledge society, inclusion of science in a political and social life context. The importance of scientific researches grows, as well as the price of their consequences. The modern science represents combination of three layers of a classical science, i.e. merging of basic researches, applied workings and technologies. Multiple expansion of scientific knowledge complexity together with its modeling can be observed. It is manifesting through the fact that computational experiment becomes a prevailing method of scientific cognition. All these aspects of scientific activities focus on the problems of experts and expert evaluation.

It is necessary to note the changes in an image of a knowledge expert. Traditionally, scientist was the expert because he knew all about the world. The structure of entitative world was considered to be essentially cognizable and the model of this knowledge complied with the laws formulated within the framework of classical physics. In the process of complication and differentiation of the physical picture of the world the expert knowledge also became more complicated and differentiated. A modern expert knows only separate fragments of the reality, and also recognizes the relativity of his/her knowledge, as well as the risks connected with expert scientific activity. This is an ideal state of things. The real state of things is a little bit different.

Professionalism of a modern expert is often measured by a degree of his/her publicity. Here publicity is understood as an area of self-presentation in the manner of Hannah Arendt. Practically, presence at every possible session, discussions and even talk shows become a duty of an expert. Career and scientific destiny of a scientist literally depends on that. Be you exceptionally clever, if you are not well-known and recognizable the probability of getting support for your research is almost zero. Therefore, self-presentation and self-promotion become principal activity of a modern scientist if he wishes to be successful. Such specific aspect as interdisciplinarity comes to light. Naturally, in this context scientific conscientiousness and scientific professionalism proper are far from being first-priority. This is also one of the reasons of modern popularization of scientific knowledge. Scientific journalists, at least in mass consciousness have more authority than scientists. And the destiny of your project depends from your ability to make an impressive description of its advantages. There lies the paradox – that the price of acceptance of scientific and consequently political decisions grows, while the support is given to the better presented and more public solutions.

But, on the other hand, this is also a problem of realization of scientist's creative abilities. Often publicity limits professional realization. For example, S. P. Kapitza, host of the Russian Television science magazine Obvious – improbable, established himself only as a popularizer of science, instead of becoming an eminent physicist. He has spent all of his life being guided by the requirements of the audience. As a matter of fact, this situation is a continuation of E. Fromm's dilemma "To be or to seem?"

Besides, publicity creates illusion of the right to judge and make assessments. The public person is expected to be recognizable, clear, definite, and above all predictable. Actually, there are only two ways: either a scientist becomes a “citizen of Castalia”, that is hides in his/her study and lives in the world of books, or becomes a public person, thereby transforming scientific activity into a “show of one actor”. As a matter of fact, this is an immemorial opposition of "private vs. public". Both are of course set by social expectations.
An expert is someone who makes opinions. He is either agreed with or not. It is very costly to make each time an original product and in sense material, both from the point of view of material and psychophysiological resources. It is much easier and above all more effective to combine and transform an already existing intellectual product. However, there is a certain border of such a cycle as there begins stagnation.

One more problem of scientific sphere publicity is fragmentation of expert scientific community. Firstly it happens because of the immense volume of the existing information and secondly because of the system of certain filters conditioned by sociocultural causes in the “invisible colleges”. The problem of identity connected with publicity is also actualized here.
Modern public communication is carried out mainly through the Internet and other mass media. It imposes certain restrictions on the publicity of a person. The modern public discourse itself cannot progress only within the limits of rationality, particularly scientific one. It should necessarily use a figurative, irrational component. Thus it is essential to keep in mind that publicity of a scientist often cannot fit into prevailing national concept, but is in a greater degree focused on many exogenous factors, in particular on the system of international grants, etc. Therefore it is possible to state that the publicity of scholars creates a certain symbolical matrix of reality perception which is then globalized and imprinted in public consciousness. Hence the results of scientific activity alienate more and more from a person. Besides, this publicity actually creates the reality of our world and current social practice.

These ideas show only a newly-emerged problem of “publicity of a scientist as a measure of his/her professionalism” so far and they are not complete. Open discussion is welcome.

Transdisciplinary Research and Sustainable Innovations: The Case of EcoBuy Vienna

In my talk I would like to present three hypotheses, derived from empirical investigation of "EcoBuy Vienna" – a now 10 years running programme of the municipality of Vienna for green public purchasing:

1. The development of transdisciplinary research was stimulated and shaped substantially by the challenge of unsolved environmental problems and the environmental movement.
2. Transdisciplinary knowledge production has a growing impact on environmental policy and on policy stimulated technology development and dissemination.
3. Successful transdisciplinarity is depending on matching structures between research and politics/administration, and actors, willing to leave their "cultures" – be it scientific or bureaucratic – for a limited time-span.

Starting with a short look on recent views on sustainability, environmentally sound technologies and transdisciplinarity I will try to reconstruct some steps of the co-evolution of modern environmental policy and transdisciplinary research and its main driving forces:

1. The ongoing scientification of problem-solving quickly included the field of environmental problems; but also the limits of disciplinary scientific answers became obvious.
2. The environmental movement was (and is) a heterogeneous movement, fighting against nuclear power plants, against highways in eco-sensitive regions, for GMO-free areas, against waste dumps or incinerators, against the (chemical) pollution of food, air, water, soil. Many of these problems were new challenges for (not only) engineering or science students, new professional perspectives turned up, in search of technical and organizational alternatives.
3. The political-parliamentarian relevance of the environmental movement created specialized politicians and administrators. It stimulated law-making and the demand for more practical knowledge and advice: transdisciplinary knowledge. Finally specific problem-oriented research programmes were introduced on regional, national and international levels.
4. A new type of scientist/decision maker emerged: intermediate persons, who had parts of their career in research, parts of it in political administration; persons, who are able to leave their professional cultures for a limited time span, who are able to play revolving roles.

My practical example for this development is "EcoBuy Vienna", a green public procurement programme involving about 250 employees of the municipality of Vienna, and external experts.
On the one hand the in-depth interviews I had with main actors of this programme give some empirical evidence for my mentioned hypotheses and made visible success factors of knowledge production close to decision making intending an accelerated diffusion of sustainable technologies. On the other hand the limits of participation within transdisciplinary processes were named, e. g.:

- time
- power
- competence
- normative background

I would be very interested to discuss with colleagues these success factors and limitations of transdisciplinary knowledge production and in their view on the conflicting challenges an "embedded scientist" is facing.

My presentation is based on parts of my habilitation thesis project "Transdisciplinarity and the Sustainable Shaping of Technologies".

Preemptive politics of the current assessment regime of (nano)technology

In a recent overview on the topic of nanotechnology, Fiedeler and Nentwich listed more than twenty forms of accompanying research ranging from toxicology, and innovation studies, to different forms of dialogue. This diversification and amplification of technology assessment in a broad sense suggest the assumption of the emergence of an overarching assessment regime.
In taking an analytical and critical distance to the regime, my presentation will focus on the current political constitution that has enabled it to come into being. In this vein, the link between technology assessment and 'governance' deserves a closer look. By drawing on ideas of Baudrillard , Laclau, and Rose, the hypothesis is put forward that the present governance of novel technologies (by means of various assessment endeavors) embodies a kind of preemptive politics.
This concept shifts the attention to two aspects of governing technology: On the one hand, preemptive politics does not so much govern things, but make them governable in advance. On the other hand, it represents a politics before politics, insofar as it anticipates supposedly 'usual routine politics', in order to not let it happen.
By referring to three different case studies, the preemptive character of a technological assessment regime will be analyzed:

1. The forestalling of an anticipated public debate by organizing 'ersatz-dialogues' with citizens,
2. the premature involvement of allegedly 'risky players', such as NGOs in stakeholder dialogues,
3. proactive efforts in crafting soft laws as an act of bypassing governmental hard laws.

Beyond Knowledge Society: Differentiation or De-Differentiation?

The presentation outlined here presents partial results of my PhD-thesis, which has been developed at the Institute for Science and Technology Studies at the University of Bielefeld. The Working Title is “Truth and Utility – The Impact of Practice Communication on the Structure of Modern Science”.

In recent Science and Technology Studies it has become conventional to describe present-day science as an essentially new endeavour: The discourse is about “The New Production of Knowledge” (Gibbons et al. 1994), about “Post-Normal Science” (Funtowicz and Ravetz 1993) or about a “Triple Helix of University-Government-Industry Relations” (Leydesdorff and Etzkowitz 2001). These diagnoses have one assumption in common: That there is no future for old notions of “pure” or “basic” science, conceptualized as a place for academic contemplation as an end in itself. Society, it is said, expects science to deliver societally relevant, applicable and practice-oriented knowledge. Through this, the terms of legitimation for science change, implying, in the best case, that scientists produce useful knowledge instead of merely true knowledge. The old “declaration of independence” is hence rejected and replaced by the idea that science deliver “truths that matter” (Kitcher 2004). However, the diagnoses cited don’t stop at this point. Some authors claim furthermore that what we’re witnessing is not just a structural changewithin the system of science but a de-differentiation between science and society (Nowotny, Scott, and Gibbons 2001). In a radical interpretation, this argument says that it doesn’t make sense any longer to talk about “science” as such, because the number of potential sites where knowledge can be created has become diverse and heterogeneous.
In my presentation I want to challenge this de-differentiation thesis with the antithesis, saying that the utilitarian realignment of science can be understood adequately only by taking a closer look at differentiation processes within the system of science. This supposition can be substantiated by a historical and by a theoretical argument.

The historical perspective demonstrates that, since its emergence in the 17th century, modern science exhibits a double tracked objective: There is the “ideal of pure inquiry” on the one hand, the “ideal of the control of nature” on the other (Stokes 1997). The best-known example is Francis Bacon, who described knowledge and power as “twin goals” in his Novum Organum (Bacon 1990, published first 1620). Another example is the German university reformer Christian Thomasius, who, as a philosopher of the enlightenment, polemicized against the “unworldly pedantry” of scholastic learning and advocated instead the idea that the goal of university education is practice, not theory (Thomasius 2006, published first 1713). Thus the historical perspective shows that there have always been discourses pointing to the “here and now”-usefulness of scientific knowledge, thereby appreciating the profane and practical value more than idealistic notions of scientific truth.

Given this historical outline, the question arises whether the utilitarian orientation of science is compatible with the notion of science as a differentatied and autonomous subsystem of modern society. In particular, I refer to the sociological systems theory of Niklas Luhmann: At first sight it seems that systems theory obliges science to seeking the truth only, since truth is conceptualized as the symbolically generalized medium of the system (Luhmann 1990). At second sight, however, Luhmann’s notion of science turns out to be much more complex. Science is modelled in a way that makes it possible to analyze the interaction of different types of structures and semantics. Within this theoretical framework, “truth” and “utility” appear as two different values, which both function as internal structures of the system of science.

Therefore the claim for societally relevant, applicable and practice-oriented knowledge does no longer appear as something intruding into the system from outside, but as a communicative structure, a generalized external reference that instructs the operations of the system. In other words, the fact that scientific communication is often practice-oriented does not necessarily imply processes of de-differentiation between science and society, but quite the contrary: What can be observed is a further differentiation of scientific communication. Finally it is possible to discuss the function of practice communication: My thesis is that it introduces “limitationality” into the system, which means, it limits the endlessly growing connectivity of scientific knowledge to some special – useful – forms of knowledge.

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Beyond knowledge society?
Reflections on professions and policy advice

Professional application of knowledge instead of just randomly using the knowledge seems to be of vital importance in societies that refer to themselves as knowledgeable societies. Also in the field of scientific policy advice knowledge is not just somehow applied, but it is done as professionally as possible. Like for professions that are typically based on action problems that need solving, the claim for enabling a decision in the face of lack of knowledge is stated in the scientific policy advice. A professional project that includes the implementation of the self-interest of a group of activists so that their own qualifications are recognised and control of the market can be achieved, means for a scientist providing policy advice that they have an interest in the recognition of their qualification (as a scientist) so that they can prevail on the market (policy advice).

If there is some truth in the thesis on the knowledge society, the exclusivity of professional knowledge will be affected fundamentally. Therefore we are asking which effects the knowledge society has on professions and on the counselling process, and we are reflecting this question against the background of established theses from concepts of the knowledge society: greater significance of specialist knowledge as a distinctive feature in relation to other forms of decision-making, loss of significance of economic factors in relation to knowledge, information and expertise, “fragility” of the knowledge society, questioning of the monopoly status of science etc.

The aim of the talk is to give an introduction into the Summer School theme “Beyond knowledge society: knowledge production, consumption and transformation” with the help of the following examples – professions and policy advice. For this purpose, several questions that are raised by the knowledge society are pointed out. An introduction to the Summer School theme and its diversity of contributions is given by mentioning the different understandings of the theoretical concepts of knowledge society.

Re-Organising university education as instrumental science

In my talk I would like to stress an aspect which is often neglected in the issues of knowledge society: the organization of academic education. This is fundamental for the academic science system and its cognitive and institutional structure. Re-organising academic education through the new public management and along with societal demands, has in impact on the institutional settings of the academic science system.

Studies about the knowledge society, the transformation of science and knowledge as well as about closer linkages to the economy and policy very often focus on research and technology, their institutional and cognitive settings and therefore modified forms of knowledge production. This culminates in the radical theses of Mode-2 (Gibbons et al. 1994), the second academic revolution (Etzkowitz/Webster 1998) and the triple-helix-configuration (Etzkowitz/Leydesdorff (1997). They lead to analyses (cf. Weingart 2001) about their scope and effects and about the re-organization, the performance and the instrumentalisation of science. Therefore questions have come up about the institutional

1. development of discipline
2. exclusiveness of academic professions
3. conditions of self-organization and external regulation
4. re-organization and steering of science and universities

Science Studies neglect the consideration of academic education. If in any case, education is regarded as a foundation of disciplinarity, as non-instrumental science and the basic element of academic Mode-1 science. This has its historical seed in the institutional development of disciplines through education and teaching, which itself is organized by the academic profession (Stichweh 1984). Therefore it offers the opportunity to institutionalize academic knowledge and to claim resources and institutional capacities. The functionalities of education that is self-organized by the academic profession can be discussed in regard to aspects of “cognitive stimulation”, “recruitment” and “institutionalization”. In contrary to the current debate, I will focus on the last point.

The new public management leads to a re-organisation of university education and teaching. New principles base upon external criteria and new societal demands for relevance, which are often driven by goals of employment. In line with the assumptions of efficiency, effectiveness and economy, a management model of entrepreneurial university is generated. In this regard, a long lasting distrust to the academic profession and its endogenous governance comes to its culmination. In contrast to that, the university is made responsible for organizing “better” education. It is regarded as a “normal” organization (Sahlin-Andersen/Brunsson 2000) and as a “strategic actor” (Krücken/Meier 2006). Describing the biggest reform package, the Bologna Process leads to a growth of regulating structures and orientation towards the employment sector. Moreover, projects like the European Qualification Framework requires the need for re-organizing education alongside indications, evaluations and competencies. The University develops a strategic organization on the basis of a management “by objectives” and criteria of relevance and performance, being external to the science system.

According to this, academic contents, scopes and competencies are limited and science faces an instrumentalisation by the new forms of governance. They lead to diagnoses of new “knowlege regimes” and a “utility conception of knowledge” (Bleiklie 2005), a “new curriculum-policy with impact on former academic Organization“ (Middlehurst 2001) and a “technical instrumentalism“ (Moore/Young 2001). Münch (2009) talks about a cognitive and social crisis of the disciplines caused by external exploitation of education and Weingart (2001) states, that the dynamic of disciplinarity is made dependent on strategic behavior of universities. Contrary to radical theses, other authors claim a process of inclusion of knowledge in universities and their curricula. Initial studies prove not only, that the reforms are linked more closely to the employment sector, but also that the so-called „soft disciplines“ are in danger of losing their existence (Witte 2006; Winter 2009). These worries points to their need of autonomous institutional competencies on education for developing disciplinary identities. Thus, by analyzing a institutional transformation of academic science, a reflection of the effects of re-organising higher education necessary. I would like to discuss this topic and the thesis of an instrumentalisation.

In my doctoral thesis I am going to focus on organization-theory. I want to take a close look at the freedom of choice for the academic profession in the context of new university governance. The debate concentrates on the new public management and institutional structures of universities. Former organizational-models like the „professional bureaucracy“ (Mintzberg), the „loosely coupled systems“ (Weick) and the German „Chair-based-organization“ (Clark) seemed to be functional for science, because they provided a relative autonomy and a professional self-rule of education. While universities are confronted with new expectations of relevance and rationality, the organizational structures and processes of universities are described as loosely coupled, anarchic, irrational and intransitive (Weick 1976; Cohen et al. 1972). New expectations and societal demands leads to a higher degree of complexity and new forms of organising need to include the individuals, with their own interest and expertise. The central question to be answered is: How are organizational processes and structures designed with regard to institutional and disciplinary differences?

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Shedding light in the theoretical basis of knowledge politics with the sociological concepts of power and knowledge – Consequences for an empirical analysis

In this paper I present a short outline of my PhD project about knowledge politics. After introducing the relevant literature, I identify gaps in the research and develop my focus on the topic.

The term knowledge politics came up in German social science discussions in the last ten years. Itis used to describe a change in the relation between science and society. This transformation gives power to regulatory processes which might influence the production of scientific knowledge and the application of its results. The main representatives of this discussion Nico Stehr, Werner Rammert, Peter Wehling and Stefan Böschen provide similar reasons for this change. These reasons are peeled out of previous analyses concerning the relation between science and society, like the concept of mode2, the concept of socially robust knowledge etc. They can be outlined in three overlapping types: (1) there are those reasons which concern transformations inside the research field; (2) the second group of reasons recognizes a change of meaning of scientific knowledge in the society through the application of scientific research results in the society; (3) the last group of reasons takes into account the societal problems that arise from the consequences of scientific results and technological applications.

Coming from these arguments, the four social scientists design different pictures about knowledge political regulation processes, their objectives and how they work. Stehr comprehends knowledge politics as a policy which is based on different social fields and carried out by their members as the surveillance and the regulation of scientific knowledge. Wehling agrees with Stehr but emphasizes especially on the possibility for keeping the option of not knowing something as a social and individual right that should be established by politics, even if this means an intervention into the autonomy of science. Böschen recognizes the necessity for creating politically legitimate public processes in order to socially regulate the basic conditions of research. In contrast to these three approaches, Werner Rammert states that knowledge politics conducted as a specific policy should support the development of science based innovations by moderating different appropriate actors in creative networks of cooperation.

The outline of the different approaches towards knowledge politics shows that this term unifies different images of the relation between science, society and politics. However it seems unclear, (a) to what extent the emergence of knowledge politics implies a societal transformation regarding the meaning of knowledge and power, (b) what kind of knowledge and what kind power is at stake, and (c) how the production of scientific knowledge or its application could in fact be influenced. Moreover, it is not clear (d) to what extend knowledge politics could be observed empirically. The presentation discusses the approaches towards power and knowledge of Niklas Luhmann and Michel Foucault. This discussion leads to a common perspective that allows it to observe and compare the different theoretical concepts of knowledge politics. Following, it is shown how a discourse analytical approach could enable an empirical analysis of knowledge politics. Therefore the German discourse about nanotechnology is taken as an example.

Economic principles and scientific practice: The case of research groups in the field of advanced materials research

The “Anti-economic economy” of science, how Pierre Bourdieu (1998) has termed it, is also the “illusio”, the specific form of scientific self-interest, characterised by unselfishness, gratuitousness' as well as the actors ability to sense where prestigious research topics lie and the strive for recognition amongst colleagues. It is the “altruism that pays” as in other economies of symbolic goods, which is the primary characteristic of the scientific field. In this quality lies the difference from the “ordinary” economy, which is centred on material goods. The autonomy of the scientific field can be measured in its ability to stay true to these characteristics and by the degree to which forces within the scientific field are independent of the forces from other social fields. To Bourdieu, it is the ability of the fields’ actors to break or specifically form constraints or demands from other social fields, which determines the scientific fields’ autonomy.

During the last 20 years research governance in European countries has been transformed. Germany is a recent case for this transformation, leading to a more market oriented research governance. All Institutions of the publicly funded research system in Germany such as Universities as well as publicly funded Research Organisations are affected by this process. A popular example for this new research governance is the introduction of New Public Management (NPM), which is basically the introduction of instruments from business administration as organisational principles into Universities. The transformation of the scientific governance can be attributed to the political field. The shared believe in the market Form as the best organisational principle is what the diverse reform initiatives affecting the scientific field have in common.

A popular approach to characterise this transformation is the term “Economisation” (Ökonomisierung), describing it as a process of adoption or enhancement of economic principles of action into non-economic social spheres, here into the scientific field. While this process affects all disciplines and institutions of the scientific field in some way, engineering science is a special case. More than in other scientific fields, researchers are expected to fulfil societal expectations of innovation and economic growth. But while new Governance instruments are being implemented into Germany’s public research organisations, there is still little empirically based knowledge on the effects of this new governance on scientific practices in this or other scientific fields. Do the “classic” characteristics of scientific practices still apply? Are its actors able to reproduce their illusio, or do they follow economic motives in their day-to-day practice? To fully understand the implications of this new research governance for this scientific field, the analytical focus has to be directed at the micro-level and take research team’s day-to-day practice into focus. Observing a research teams’ routine will allow to gain insight into the decision making process in research teams and on the structural and non-structural aspects shaping these decisions and their consequences.

How is the scientific practice of research teams in engineering sciences, for example in advanced materials research, affected by the introduction of economic principles through new modes of governance? With this paper I would like introduce my PhD Project addressing this research question. Further research questions are: What are demands and expectations research teams have to meet? What roles are organisational settings, here Universities and Germany’s two major publicly funded research organisations, playing for research teams’ scientific practices?

These questions will be addressed in a micro-sociological study using methods of qualitative social research like participant observation and a case study approach comparing research teams in different organizational settings. With this paper I will focus on the analytical framework guiding my study which is based on theoretical concepts by Pierre Bourdieu and Robert K. Merton.

Outlining a Social Epistemology for Socio-Technical Epistemic Systems

In recent years new applications emerged on the Web which received the labels Web2.0 or social software. In many of these applications people are engaged in epistemic activities, such as the dissemination, organization or creation of knowledge. The goal of my talk is to outline a new socio-epistemological framework for the analysis of such epistemic social software, which I have developed in my PhD-thesis "Knowing Together – A Social Epistemology for Socio-Technical Epistemic Systems". Although the model was specifically developed for the analysis of such systems, it is generic enough to deliver a framework for the analysis of socio-technical epistemic practices in science for two reasons. Not only does most literature on which the model is based focus on epistemic practices in science; epistemic practices on the Web and in science also share certain basic commonalities, which render the transfer of insights from science to the Web plausible.

Because interaction between multiple agents seems to be the key to understand the epistemic processes on the Web, I have chosen social epistemology, the philosophical discipline exploring the ways and the extent to which knowledge is social, as a theoretical framework for such an analysis. However, none of the existing comprehensive social epistemologies (e.g. Fuller 1988, Goldman 2003, Kusch 2002, Longino 2002c, Solomon 2001,) delivers a sufficient framework to analyze epistemic social software. The main reason for this is that the role of technology for contemporary epistemic processes - in science as well as on the Web – is not sufficiently acknowledged. In order to account for the interplay between the social, the technical and the epistemic, I have therefore developed a new socio-epistemological framework to analyze epistemic social software which is rooted in socio-epistemological discourse, but amends it with insights from the field of Science and Technology Studies (STS), in particular from feminist approaches in STS (Suchman 2007/2009, Barad 2007), as well as the field on Values in Design (Friedman 1997a, Nissenbaum 1997, Flanagan, Howe et al. 2008).

My framework is founded on a tripartite classification of socio-technical epistemic system based on the mechanisms they employ to close socio-epistemic processes. These three mechanisms are integration, aggregation and selection. In my talk I will outline the differences between these mechanisms in more detail. With this classification I do not aim at reducing the differences between systems to their mechanisms of closure. However, I argue that the classification based on this indicator is heuristically fruitful. Systems employing different mechanisms of closure depend on different social, technical and epistemic prerequisites, have different strengths and weaknesses and are optimal for different epistemic tasks. My model puts a fact into the focus that has been neglected so far in social epistemology: the technical and its relationship to the social and the epistemic. Since most epistemic practices are nowadays pervaded by technologies, such a consideration of the role of technologies in these practices seems to be indispensable for any social epistemology that aims at being not only normatively appropriate, but also empirically adequate.

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Does spatial proximity in knowledge production matter? The example of "Centres of Excellence" funding schemes.

Centres of Excellence Programmes (CoE) are becoming more and more common as a funding scheme in the European Union member states. In an environment of increasing internationalisation of science and research and intensified competition, European countries intend to bundle their top-level research capacities in order to build up "critical masses". Since the 1990s several European states started such programmes. Examples are the Centres of Excellence in Denmark, Finland, Sweden or Slovenia, the National Centres of Competence in Research in Switzerland and the Pôles d´excellence" in Belgium. Recently we see development on a supranational level, too. The Scandinavian states set up a funding scheme for Nordic Centres of Excellence. The 2008 established European Institute of Innovation and Technology (EIT) is concentrating its funding on so-called Knowledge and Innovation Communities (KIC). They shall lead to a "collaborative partnership, a legally and financially structured and managed entity of internationally distributed but thematically convergent parties"[1]. Germany started its CoE programme in 2005. Both the Federal Government and the Federal States (Bundesländer) agreed on starting an Excellence Initiative to promote top-level research and to improve the quality of German universities and research institutions in general. Subdivided into three lines of funding, one of them is oriented on Centres of Excellence schemes. So-called "Clusters of Excellence" shall enable "German university locations to establish internationally visible, competitive research and training facilities, thereby enhancing scientific networking and cooperation among the participating institutions" (DFG 2010).

The programmes address similar goals: Concentrating "critical masses" of research resources (both human resources and infrastructure) to promote top-level research and strengthen international visibility and competitiveness in order to build up so-called "beacons of science". Although the overall goals are similar, there remain differences between the programmes. One is in how far geographical proximity between researchers is addressed in the funding scheme. While several announcements explicitly invite only local/regional research networks to apply for funding, others aim at promoting national or even international networking. The Swiss programme is focussing on nationwide networking of top-level research capacities, as does the Finish scheme. The Danish CoE feature a strong local concentration. In between are examples like the Norwegian CoE that combine both local centre-building and nationwide networking. The German Clusters of Excellence shall build up at German university locations internationally visible and competitive research and training environments and by this foster networking and cooperation (DFG 2005a, 2009). To achieve this, at certain locations the available resources of universities and extra-universal research institutes are to be clustered, and synergetic effects to be used[2] (ibid.). Wherever thematically reasonable, networking overlaps organisational borderlines and concentrates resources of different research organisations (in several cases industrial partners, too) within a Cluster of Excellence. A first evaluation of the 37 currently funded Clusters of Excellence at German university locations clearly demonstrates, that with only a few exemptions all concepts show a dense local/regional network of research partners (Sondermann et al. 2008: 54).

1 http://eit.europa.eu/fileadmin/Content/Downloads/PDF/kics/KICS_call_2009_04_02.pdf

2 Die an einem Ort vorhandenen Ressourcen an Hochschulen und außeruniversitären Einrichtungen sollen…gebündelt und Synergieeffekte genutzt werden.

As mentioned above, despite of different network-approaches (local, regional, national, international and combinations thereof) the funding schemes are referring to similar goals. This raises the question in how far spatial proximity is an important element of CoE. To what extent does proximity between scientists involved in CoE-like research projects matter? Research on the importance of spatial proximity in research is often focussed on interaction processes between science and industry (Etzkowitz/Leydesdorff 1997, Fritsch/Slavtchev 2007). Studies addressing cooperation between scientists not generally include spatial aspects (Gläser 2006), but rather focus on the ever more interdisciplinary nature of science (Jansen 2008, Laudel 1999). Scientometric studies on the importance of spatial aspects in science (Katz 1994, Narin 1991) only take into consideration the visible results of research (publications) while leaving out the processes behind. Recent studies of economic geographers in this field lead to the assumption, that next to geographical proximity there are other dimensions of proximity that need to be taken into consideration, too: e.g. social, cognitive, institutional proximity (Boschma 2005, Ponds 2007).

For my dissertation I will explore the (regional) networks built up within the German Clusters of Excellence and analyse the notion of the researchers involved in these projects. To what extent do they go in line with the funding schemes´ focus on regional networking? Do they see any advantages on their particular research opportunities so far (besides the aspect of receiving funding)? For a sample of Clusters of Excellence (in the fields of life sciences and natural science) I will survey the network partners, interview project leaders and finally start an online survey of all principal investigators involved. However, the international perspective is important when building a solid background about the topic of geographical proximity in CoE. Therefore during summer and fall 2010 I will interview a number of representatives from research funding organisations concerning “their” particular CoE programmes. Research questions are: How did the programmes develop, what are intended effects? What is the importance of spatial proximity (if at all) and to what extent does it influence the success of the CoE?

Results of an evaluation during the implementation phase of the German Clusters of Excellence show that indeed the overall part (56,2 %) of the research institutions that form members of the networks are located within the region of the Cluster (Sondermann et al. 2008: 54). Nevertheless it seems as at the moment the main effect of the Clusters rather is an intensified cooperation across disciplines within the funded universities. In an online survey the principal investigators of CoE responded to a question about the impact of the CoE-funding on their personal research conditions as follows: 81,5 % declared their cooperation with researchers from within their university increased. While only a minor part saw an increased cooperation with researchers from other extra-universal research institutes (46 %) and other universities (38,1 %) (Sondermann et al. 2008: 105). However, due to data limitations effects of geographical proximity could not be tested so far.

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"Beyond Knowledge Society: Scientific knowledge production, consumption and transformation"

In recent decades, issues of scientific knowledge production, consumption and transformation have become increasingly important, but also contested. On the one hand, stakeholders, citizens and policy makers are asking for scientific advice in a multitude of areas and there is an increasing recognition of the ways in which scientific knowledge production might contribute to a large number of societal problems. This recognition of science production is also reflected in the all-pervading discourse of 'evidence-based policies en practices' in a diverse range of settings, in which the use of scientific knowledge is seen as the best way forward (Cookson, 2005; Olsson, 2007; Lin & Gibson, 2003; Anderson et al, 2005).On the other hand, however, much of that scientific knowledge is also being contested, questioned, or simply neglected by these stakeholders and policy makers. The status of ('pure') scientific knowledge seems to be eroding and the problems scientific knowledge is expected to solve are increasingly complex, ambiguous and uncertain (Bijker et al, 2009).

Many authors furthermore complain about insufficient use of research findings in policy and professional settings, which seems to signal to a lack of research consumption and an improper transformation of research findings (Weiss, 1991; Davis & Chapman, 1996; Locock & Boaz, 2004; Brownson et al., 2006; Goldstein, 2009). Scientists are also increasingly called upon to improve this uptake by showing the societal relevance of their work. Indeed, this tendency is becoming so strong that some even proclaimed a new mode of scientific knowledge production ("Mode 2") (Gibbons et al., 1994). Although the term coined several critiques that remain valid (Weingart, 1997), the authors are rightly pointing out that the notion "struck a chord of recognition among both researchers and policy-makers" (Nowotny et al, 2003). Without generalizing to 'science as a whole', I would argue that there numerous examples of innovative formats and settings that could qualify as 'experimental Mode 2-settings'.

In the Netherlands, the recently developed Academic Collaborative Centers for Public Health (ACC) can be seen as exemplary. These Centers are formal, long-term collaborations between a Public Health Service (PHS) and a given university department. The ACCs can be seen as 'coordination structures' between local public health policy, practice and research, with an overall purpose of structurally strengthening and anchoring demand-driven research activities in the area of public health. The paper will describe several tendencies within the public health sector that impinge on the notion of Mode 2 science and that set certain boundaries with regard to the ACCs. For example, even though Mode 2-formats are increasingly being used to experiment with, within science funding processes, arguably Mode 1-criteria still seem dominant.

These tensions between Mode 1-imperatives and Mode 2-experiments can be analyzed by unraveling the debate about the perceived 'gaps' between the domains of public health, policy, and practice, including the ways in which the ideal relations between these domains are characterized and the ways in which the 'evidence-based discourse' impinges on that debate. On the one hand, one of the explicit goals in establishing the Collaboratives is to reduce these gaps by achieving better collaboration between local public health policy, practice and research. On the other hand, the ideal relations between the domains are still often described from a perspective of distinct 'communities', in which terms such as 'knowledge transfer', 'research utilization' and 'knowledge uptake' still reflect a rather traditional, linear 'science speaking truth to power'-perspective on the relations between researchers, policy makers and practitioners. At the same time, the actors involved in the Centers need to continuously find a balance between two aspects: on the one hand, they need to coordinate their activities and create mutual consensus within the Centers, while on the other hand they need to legitimize these decisions and consensuses to their own organizations.

The ACCs are excellent empirical examples to investigate the highly interrelated issues of scientific knowledge production, consumption and transformation within the field of public health. Indeed, one of the central goals of the Centers is to improve knowledge consumption through collaborating in the stage of knowledge production and placing increasing emphasis on issues of knowledge transformation into formats that are relevant and useful for professionals and policy makers. In this sense, scientific knowledge production, consumption, and transformation cannot be separated that easily, especially in 'mode 2-settings' such as the Collaborative Centers. The paper will present four case studies of projects conducted within the Centers, in order to empirically analyze how the interactions between policy makers, researchers and professionals developed in the context of the project, how the actors try to find a balance between reaching consensus and legitimizing decisions, and which consequences this has for issues of knowledge production, consumption and transformation. The case studies are selected on the basis of a most different cases design. Methods included document analysis, observations and a series of 60 semi-structured interviews.

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Changes of knowledge in public administration. An information and knowledge centered analysis of Electronic Government

In knowledge societies changes of the significance and characteristics of knowledge do not only concern science and technology (and scientific knowledge respectively) but can also be observed in various, if not all, societal spheres and institutions. Furthermore, science is no longer the only (and uncontested) place of the production of knowledge, rather in knowledge societies knowledge is being produced in socially distributed structures across societal sectors (Willke 1998: 164).

My proposed contribution focuses on a sphere in which changes of knowledge are becoming increasingly apparent since the last years: public administration. Even though the implementation of information and communication technologies (ICTs) in public administration has a history of more than 40 years by now, only in the recent 10-15 years – under the designation Electronic Government (e-government) – the use of ICT networks has become a central component for comprehensive public sector reform concepts. Being inseparably connected to the concept of networks (both technological and organisational), the implementation of networked ICTs is seen as the key for the re-organisation of administrative routines, work processes and structures.

As “public administration is basically an information processing enterprise, not only at its management level but also in its primary processes, at the very production level” (Lenk, Klaus, cited in Snellen 1997: 195), e-government demands and enables new practices of information and knowledge work in the administration. As such a technologically enabled re-organisation also address wider organisational concepts, e-government reforms are increasingly being discussed in the context of organisational arrangements and new modes of governance (Brüggemeier et al 2006). In this respect e-government is supposed to lead to a “transformation of state and administration” (Hill 2004) and a new “public sector culture” (Millner 2000: 172) that comprise new modes of interaction with societal actors, altered administrative tasks and functions, and a new self-conception of public administration. In far reaching e-government-concepts accordingly the “virtualised” public administration’s main function is defined as “societal knowledge management” (Jansen/Priddat 2001: 92, own translation).

The aim of my paper is to analyse and discuss the implications of e-government with reference to the forms of administrative knowledge as well as to the practices of its production, management and use. In particular, special attention shall be given to changed ways in which the e-government administration perceives its societal and natural environment – and itself.

My proposed paper is based on my doctoral thesis that was mainly conducted at ITAS, Karlsruhe, and shall be submitted to University of Klagenfurt (Department for Science and Technology Studies, O.Univ.-Prof. Dr. Arno Bamme) in 2011. The dissertation project’s perspective on the e-government field is characterised by approaches from administrative and political sciences, governance research and STS. In terms of a co-production of technology and society, e-government is explicitly not regarded as a mere technological project.

Rather e-government is analysed by focusing on the interplay between modernisation discourses, technological and organisational options, the practices of implementations, and operational work processes. Therefore the processes in public administration are identified as knowledge work, and e-government concepts are analysed against this background. The empirical analysis consists of three case studies in local government. These cases studies mainly observed work processes and IT-implementation projects in departments for urban and environmental planning, focusing on the use of networked Geographical Information Systems that can be seen as integral applications for local e-government (Strobl/Griesebner 2003). The findings point, on the one hand, to interesting shifts in the knowledge base of local public administration. On the other hand it can be seen that the effects of informatization projects are limited by an insufficient attention to organizational aspects and specific utilizations of the networked infrastructure.

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Recommended Literature

The following articles show a brief overview on the topic of „knowledge society“. This very limited selection is just meant to give some helpful input to the forthcoming discussions.

Fuller, Steve (2001): A Critical Guide to Knowledge Society Newspeak: Or, How Not to Take the Great Leap Backward. In: Current Sociology. Vol. 49: pp. 177-201.

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Shinn, Terry (2002): The Triple Helix and New Production of Knowledge: Prepackaged Thinking on Science and Technology. In: Social Studies of Science. Vol. 32: pp. 599-614.

Just in addition: As you can see we also registered one article in German for those of you who are able to understand the language. Unfortunately we haven't found any comparable text in English but all the rest of the articles (which are written in English) should also provide adequate perspectives and arguments for the discussions.

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