

Elisabeth Gulbrandsen, Lena Trojer, Pirjo Elovaara (2007),
Processes of Cooperation in Innovation Systems
- feminist technoscience studies as a resource for development and learning,
121 paragraphs, Version 1.1, 2007 05 03,
<http://feministtechnoscience.se/journal/>

Processes of Cooperation in Innovation Systems - feminist technoscience studies as a resource for development and learning¹

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Document Version 1.1, 2007 05 03

Abstract

This paper is one result of a project funded by VINNOVA (the Swedish Governmental Agency for Innovation Systems) in connection with the call for proposals “Gender perspectives on innovation systems and gender equality – research and development projects for sustainable growth”. The product of the project is the process itself. This process enabled synergy effects through local and regional agreement on strategies and practices for sustainable innovation systems also providing equal opportunities. The paper aims to demonstrate the potentials and experiences feminist research can offer regarding mainstreaming knowledge and policy production within domains dominated by technoscience. It is the very act of working on integration that requires and stimulates development of other theoretical perspectives and methodological ways of relating.

Keywords

Feminist technoscience, innovation system, technoscience, gender research, NetPort, co-evolution, triple helix, EU Commission, politics, knowledge production, situated knowledge, Donna Haraway, Bryan Wynne, Sheila Jasanoff, Reio Miettinen, Helga Nowotny, learning processes, kitchen cabinet, VINNVÄXT, Region Blekinge, VINNOVA, gender equality, science & society, ELSA

¹ This article is based on a report on a project funded by VINNOVA (Swedish Governmental Agency for Innovation Systems) in connection with the call for proposals “Gender perspectives on innovation systems and gender equality – research and development projects for sustainable growth”.

Introduction

This paper is one result of a project funded by VINNOVA (the Swedish Governmental Agency for Innovation Systems) in connection with the call for proposals *Gender perspectives on innovation systems and gender equality – research and development projects for sustainable growth*. The study was carried out during the period 1 July 2005 – 15 February 2006. <1.>

The product of the project is the *process* itself. This process enabled synergy effects through local and regional agreement on *strategies and practices* for sustainable innovation systems also providing equal opportunities. <2.>

The paper starts with a relatively detailed presentation of the various positionings, in order to demonstrate the relevance of the focus on processes of cooperation within innovation systems. This is followed by an account of activities undertaken in the pilot study. <3.>

Gender equality is an integral part of the project idea as a whole – and its execution. Nevertheless, gender equality is focused explicitly in the short study of the Vinnväxt programme and the interviews with regional representatives as well as in a specific article published. <4.>

Background

Innovation systems (IS) entail challenges for the collaborating actors: primarily academia, trade and industry, and the political sector. The purpose of the project was to prepare the grounds – in practice and in theory – for processes of cooperation within innovation systems with a focus on research transforming processes. The practical element is represented by a local innovation system, NetPort.Karlshamn, in a regional context, Region Blekinge. The purpose is two-fold: to use feminist technoscience studies as a resource for development of an innovation system, and at the same time develop theory and practice within feminist technoscience studies through focus on an innovation system. <5.>

A number of important and central questions related to collaboration must be dealt with when participating in an open system for knowledge production. The main challenge is connected to realising that we are taking part in *non-linear processes*. NetPort is being developed through *co-evolution* yielding specific results within the different actors' respective areas of activity. Co-evolution also entails *strong requirements for change* in the respective organisations / sectors. This is particularly noticeable within Blekinge Institute of Technology. We could tell a number of amusing and frustrating stories about inertia when it comes to implementing necessary changes within the Institute. We also notice that what we are doing comprises a convergence of *knowledge production and policy production*. Or to put it another way; research and politics are connected to the extent that research is being regarded as a policy sector in its own right, not just regarded as instrumental input for development of other policy sectors. There is nothing strange about this. It is happening on all levels – local, regional, national, and European, as Elisabeth Gulbrandsen points out in her study of innovation systems in an EU perspective (this paper). And it is succinctly put in one of Nowotny's articles published in *RTDinfo* in May 2005: "Innovation is the collective bet on a common fragile future and no side, neither science nor society, knows the secret of how to cope with its inherent uncertainties. It has to be done in some sort of alliance and with a shared sense of direction." <6.>

Positionings

The Region and the Institute of Technology

The Blekinge region underwent radical structural changes in the 1990s, from being dependent on heavy industry and military activities to focusing on development of information technology (IT) within both industry and education – the latter in the form of a new technical college, Blekinge Institute of Technology (BTH) (Nilsson, Uhlin 2001). This development encompasses recognition of a technology policy and research policy firmly anchored in understandings of the production of knowledge and technology as processes in distributed systems (Gibbons et al. 1994, Nowotny et al. 2001, Uhlin, Johansen 2001). In other words, nowadays knowledge is increasingly being developed in overlapping areas, or at the borders between higher education, industry (the private sector) and other local / regional / national / international actors (the public sector). These processes are very apparent in Blekinge and in the research and development being done at Blekinge Institute of Technology. <7.>

Blekinge was defined as a region on 1 January 2001, and on 2 January 2003 it became a so-called county coordinating body, pursuant to the new Act on county coordinating bodies. This meant that Blekinge as a region assumed responsibility for development of the region from the county government. As a result, the organisation Region Blekinge now bears the political responsibility for development of Blekinge. In practical terms, this means Region Blekinge represents the inhabitants in important questions concerning growth and development in Blekinge (see www.regionblekinge.se). With a view to promoting growth in Blekinge, the regional government decided in 2004 to set up and fund a regional resource centre for women in Blekinge (RRC Blekinge). The Centre is currently being financed with funds from the European Union's Structural Funds, objective 3. The long-term goal is to help ensure that women and men have equal influence on regional development work and to increase women's input and enterprise by increasing the number of women involved. <8.>

Karlshamn Municipality, NetPort.Karlshamn, Campus Karlshamn and Custom Red

Karlshamn Municipality has implemented major structural changes in an effort to complement traditional industries with knowledge and service activities, the motivation being the need to diversify trade and industry and provide existing companies with support to develop expertise. The municipality and representatives from the business world decided to collaborate on setting up a development scheme to promote growth in Karlshamn. A major initiative was undertaken in the mid-1990s in the form of the founding of the organisation NetPort.Karlshamn, with the goal of creating a knowledge centre, and persuading Blekinge Institute of Technology to establish a new campus in Karlshamn. <9.>

Much of the economic growth in Blekinge came about as a result of the establishment of new campuses at the two other large towns in the region: Karlskrona and Ronneby. NetPort was set up as a complementary investment in the Blekinge region with a view to building up the region as a strong, competitive IT region. Telecom City in Karlskrona and SoftCenter in Ronneby are corresponding local innovation systems, with a focus on telecommunication and software development respectively. <10.>

NetPort.Karlshamn's objective is to become a centre of expertise for media technology, the experience industry and intelligent transport systems (see www.netport.se). Close collaboration between the Institute, industry and the local government was crucial in order to maximise the impact of establishing a college in Karlshamn. This collaboration was organised in the form of the project NetPort.Karlshamn, which started in 1999, plus a common formal organisation from 2005. NetPort.Karlshamn functions as a dynamic actor in the interaction between trade and industry, Karlshamn Municipality and Blekinge Institute of Technology. Much of the work is physically done in new, purpose-built premises at East Pier, one of the most attractive locations in Karlshamn. <11.>

NetPort.Karlshamn can be described as a triple-helix organisation. The triple-helix model outlines the outer framework for activities and basically indicates that there are three main actors that together create activities and growth. These three actors are academia (the Institute of Technology), the private sector and the political sector. Getting these three actors to collaborate is a long and complicated process. There are no easy recipes for the internal processes of collaboration within triple-helix organisations. It is here that feminist technoscience studies comes into its own as a resource for development of relevant practice and theory. Being involved in a triple-helix organisation can be quite a challenge for a college and for traditional academic activities. We must put aside the image of universities and colleges as an ivory tower where pure knowledge is produced, which can then be applied to develop commercial / practical applications elsewhere. The processes for developing knowledge and technology we recognise nowadays are better characterised as distributed knowledge processes, i.e. that research and development are undertaken in the context of practical applications. The context dependence is crucial and we are increasingly aware of the importance of creating knowledge that is socially, politically and culturally robust. Phenomena are interrelated and call for broad participation by women and men in different functions. <12.>

In 2000, the Institute of Technology set up a campus in Karlshamn. In 2005, the campus had some 400 students and approx. 50 teachers and researchers. The Karlshamn campus has the following academic profile:

- **Media technology including game development**
 - Undergraduate courses
 - Media technology, Bachelor's programme 120 credits
 - Digital Games, Bachelor's programme 120 credits
 - Expression in digital media, Master's programme 40 credits
 - Digital sound production, Bachelor's programme 120 credits, starting autumn 2005
 - Independent courses
 - Research
 - Technoscience studies (feminist technoscience studies),
 - Digital game development in collaboration with University College Gotland
- **Experience-based learning**
 - Undergraduate courses
 - Cross media and event production, 80 credits, starting autumn 2005

- **Intelligent transport systems / Intelligent logistics**
Undergraduate courses
Intelligent logistics, Master's degree 60 credits, starting autumn 2005
Research
Computer Science
- **Qualified Vocational Education, Creative programming 2 year course <13.>**

A company has also been formed as a result of cooperation between the actors mentioned above, namely Custom Red Software Studios, which sells its products and services on the international market and has recruited a doctoral student employed at Blekinge Institute of Technology. Their website (www.customred.com) says: "Custom Red is a production company with both entertainment and business focused interactive software solutions. Founded in 2002, with a backbone of highly sophisticated graphics technology and a team with over ten years of experience in the gaming industry, we are currently working on a number of projects, including development of a next-generation game title using new creative software technology providing highly impressive visuals. Our experience with interactive software is also available for development of Interactive Media Applications to accommodate business solutions such as simulators, presentations and educational software. Custom Red is based in Karlshamn, Sweden." Custom Red is one of the collaborating partners in the project. <14.>

Main research question

The main research question is how to get the three main actors to collaborate. It is a highly complex matter, and there are no easy recipes for the internal processes of cooperation within triple-helix organisations / constellations. Efforts to render the research question more concrete focus on two main approaches:

Faith in co-evolution

On an everyday level, building up trust² between the collaborating actors at NetPort.Karlshamn has been given particular attention. Responsibility for countering and reducing misgivings has been taken seriously vis-à-vis the local population, companies and politicians and vis-à-vis Blekinge Institute of Technology, which faces particular challenges entailed by a development where the more traditional role of the university is brought into question. <15.>

Quadruple Helix

One thing we have learnt to accept within NetPort.Karlshamn is that the triple-helix model cannot function to develop an innovation system *without a fourth intermediary actor*. This fourth actor renders visible the great need for a kind of go-between or broker function. The importance of this broker role, which also includes knowledge management, is often underestimated in processes of cooperation between the business world, academia and the political sector, and perhaps more so in Northern Europe than elsewhere. The most obvious broker, trying to bring the other actors closer together in the current case (NetPort.Karlshamn), is the NetPort managing director (see below). But we also find evidence of this vital broker (and change) function being performed by the main actors and sometimes even in the Institute of Technology. As a profession, knowledge brokers are even called network coordinators or innovation organisers

² Issues concerning confidence and trust are discussed in Ekdahl *et al.*, 2000, Bordum & Wenneberg 2002, Stevrin, Uhlin 1996 and Putnam 1994, to name but a few.

(Leydesdorff and Etzkowitz 2001). One of their tasks is to act as an interpreter between the different sectors and the languages they use and to get people used to working in a single domain to perform tasks in several domains and to help motivate them for dynamic co-evolution. <16.>

A brief summary of our understanding of triple-helix processes underlines the necessity of co-evolutionary processes, built on the cornerstones of relevance and situated knowledges. We note that in our context, production of situated knowledge shifts from a focus on contract negotiations (only input) to a focus on co-evolution (the entire chain from input, via operations, to output). It is clear that the Institute and other stakeholders are subject to ever higher demands in terms of justification of their relevance: why they should be acknowledged as an accepted and legitimate partner in a robust innovation system. From the point of view of higher education, these demands by no means entail diminished motivation for production of academic knowledge and professionalism, or poorer quality; on the contrary. <17.>

Situated Knowledges

Integrating gender equality

The EU Commission's report *Science policies in the European Union – Promoting excellence through mainstreaming gender equality* (2000) identifies three strategies or policy levels for work to promote gender equality in research: namely legislation and regulations, affirmative action, and integration or mainstreaming. Similar strategies can also be employed to ensure gender equality in trade and industry, organisations and public authorities. We locate our work to promote gender equality on the third policy level *integration*. The participants in the project from Blekinge Institute of Technology have been active on the national, Nordic and European levels for quite some time now, working to identify the necessary preconditions for mainstreaming gender equality and integrating gender research into other, more established research traditions (Trojer 2000, 2002, Gulbrandsen 2000, 2002). Against this background, we emphasise that the *knowledge and skills* needed to work on gender equality at the level of *integration* are not the same as those needed in work on new laws and regulations or on affirmative action. <18.>

One central experience from our work on mainstreaming equal opportunities and gender research is that we need a counterpart to the so-called 'negative perspective' that maps the situation by identifying obstructions to gender equality, thus illustrating the problem and illuminating what we want *freedom from*. We understand mainstreaming as transformatory work, requiring that we to a greater extent also come up with ideas about *what we want to be equal to*; what we want to use our freedom for; what sort of innovation systems / research / technoscience do we aspire to? When invited to the table to integrate our concerns, we ought to be able to discuss and suggest, in fairly great detail, what kind of innovation system we want to be equal to. We ought to be able to produce visions, alternative narratives – which 'make sense' – in order to enable us to formulate concrete goals and strategies in collaboration or partnership with other actors and stakeholders. In the case in hand, we are the ones inviting others to join us in a process of change, and we have a relative interpretative advantage because our partners accept feminist technoscience studies as a resource. This also allows us to contribute to the important debate on how gender researchers and gender research assume responsibility for their relative success. <19.>

The relationship between research and society is currently on the agenda and subject to debate in Europe.³ A discussion about politics and research may also serve to strengthen the relationship between gender research and the proactive equal opportunities work that VINNOVA gives special priority in the text of the call for proposals (*Gender perspectives on innovation systems and gender equality*, page 5). Below we will indicate some more key resources for our project. <20.>

Sustainable / responsible innovations in open systems of knowledge production

The boundaries between politics and research are not straightforward and clear in a society that depends on research and knowledge. Nowadays it is claimed that research and society are co-produced or co-evolve⁴, which is a long way from the simple, linear understanding of this relationship that has dominated research policy hitherto. Research is no longer merely a *means* to realise goals in other policy sectors; research is becoming a policy sector in its own right. It is in the fields of technoscience (information and communication technology, bio- and gene technology and material technology) that scientists are most clearly pushing the boundaries between science and society, research and politics, thereby illuminating the obsolescence of a linear understanding (Gulbrandsen 2004). A typical feature of technoscience is the so-called reverse logic in that knowledge must be *applied* in order for it to be tested. A classic example is reproduction technology, from in-vitro fertilisation to cloning.

In Europe, it seems, the linear model still dominates, judging by the latest discussions concerning establishment of a European Research Council (ERC), recent conferences focusing on the future of European universities, and invitations from the EU Commission to discuss the seventh framework programme. It is worth noting that European universities are expected to contribute to innovations, work in partnership with stakeholders in networks, guarantee better transfer and exploitation of new knowledge for commercial applications, take part in public debates, and advise governments on the policy level. At the same time, the linear process is still assumed, whereby knowledge is first generated, then transferred, and finally exploited and applied. This process is far removed from a way of developing that can guarantee fulfilment of the wish for socially robust knowledge through “polycentric, interactive and multiactor processes for knowledge production” as Sheila Jasanoff (2003) suggests or through various forms of trust-building collaboration (collaborative assurance) (Guston 2000). <21.>

Increasingly *open systems for knowledge production* require a focus on the direct reality-producing effects of research – its “context of implication” (Nowotny et al. 2001). According to Donna Haraway (1997, p. 68) there is neither time nor space to develop research’s relations with society “... after all the serious epistemological action is over”. Neither sustainability nor other values that we would like to realise can be secured retrospectively. It is these features of the development that made Ulrich Beck query whether representative democracy is collapsing through development of the modern research complex as a separate policy area: “Politics breaks out in a new and different way, beyond the reach of formal responsibilities and hierarchies. So we are looking for politics in the wrong place, with the wrong concepts, on the wrong floors, on

³ See for example the EU Commission’s work on Science & Society issues, and the debate on the next generation of ELSA research (Ethical, Legal, Societal Aspects of Technoscience).

⁴ Arie Rip and Bruno Latour were central in the development of this perspective. See Nowotny et al. 2001 for a presentation of the European debate on ‘co-evolution’.

the wrong pages of the daily newspapers” (Beck, 1996, p. 24). We want to position our project and ambitions to promote more complex and integrated understandings of the relationship between research and society, in this grey area that Nowotny et al. (2001) ascribe to a dedifferentiation of the societal spheres of modernity. <22.>

Research-policy paradigms and new collaboration challenges

In her review of the Swedish Research Council *Vetenskapsrådet*, Hanne Foss Hansen identified three different paradigms in research policy (*Parliamentary reports* 2003/04:URD2). The classic research-policy paradigm is the linear model. Here, science is understood as the motor that drives progress: the “science push”. Foss Hansen calls the second paradigm in research policy “the sector-relevant approach”; science is regarded as a means of solving societal problems: “demand pull” (Kallerud 1998). As Aant Elzinga demonstrated in his article from 1994 “Till frågan om strategisk forskning” [On the question of strategic research], as a nation Sweden has a tradition marked by a bifurcated research policy, where these two research-policy paradigms have been allowed to co-exist side by side. Elzinga claims that one consequence of this for researchers is that the political dimensions have remained invisible in their everyday work life. Deeper insight was not developed into the inner dynamics of science interacting with society at large. More general, evaluative questions concerning where the so-called knowledge society is heading could not be formulated. <23.>

The third paradigm Foss Hansen identifies in research policy is “the interactive approach”. This paradigm is founded on the view that research is best developed in close interaction and collaboration with relevant fields of practice. This approach is new, demanding and has as yet few organisational expressions, according to Foss Hansen. We find her identification of this third paradigm very interesting. We see our project as contributing to the development of the “interactive approach” by incorporating analytical and directional resources in the European debate about new policy models such as mode 2, the agora, technoscience, post-normal science, etc. We also want to contribute to innovations in the fields of organisation and governance by sharing stories from NetPort.Karlshamn. <24.>

Situated knowledges and technologies of humility

The term ‘situated knowledges’ was coined by Donna Haraway as part of her epistemological and political work to provide alternatives to “... developing at home that voice of entitlement, the voice of control, that accompanies the conquest of empires far from home”, as Sharon Traweek described the conventional ‘voice’ of science (Traweek, 1992). For Haraway, all knowledge is local; it is historically and culturally situated. It is problematic to argue for a watertight bulkhead between the researcher as a subject and the research object, between observing and changing, and between research and politics. The researcher is regarded as an active participant in the research process, she generates and organises knowledge in an ongoing interaction with the reality she is researching. <25.>

Situated knowledges is a cornerstone concept in feminist technoscience studies (Haraway 1988, 1997). The significance of the local, the situated, is also expressed by Reijo Miettinen (2002) in the following: “... innovation is about adapting to changing circumstances and making new things in new ways. New ways to do things always emerge locally”. <26.>

We find an interesting parallel in the challenges Sheila Jasanoff issues to political decision-makers in a recent article, where she comments on the spread of co-evolution and interactive models related to science and technology policy (Jasanoff 2003). Co-evolution of science and society has led to a greater degree of complexity, unpredictability and irregularity in both spheres. Jasanoff broadens the discussion further by claiming that political decision-makers need to develop a set of technologies of humility in order to be able to assess the unknown, unspecific and uncontrollable, the ambiguous and uncertain aspects of the development of science and technology. Technologies of humility require different capacities and forms of engagement between researchers, experts, political decision-makers and the general public, differentiating them from the regulating, predicative 'technologies of hubris'. Political decision-makers are currently wasting a lot of time on the latter. Jasanoff is not alone in addressing questions of complexity and uncertainty in relation to science and political decisions. In some extremely interesting and rather provocative suggestions, Brian Wynne (2003) and Jerry Ravetz (2000) have recently placed the partial ignorance of science at the heart of the discussion about how we should understand, differentiate, express and communicate complexity and uncertainty. All in all, we believe that 'situated knowledges' and 'technologies of humility' cast light on some of the central preconditions for accountable and sustainable innovation systems, also in the Nordic context. Arguments to support this claim are presented below in the brief summary of Reijo Miettinen's study from 2002: *National Innovation System*. <27.>

Innovation system as a transdiscursive concept

'Innovation system' was one of the first concepts put forward as an interactive alternative to the linear model. The term is in widespread use in the Nordic countries. Finland is usually held up as the paradigmatic case because of its use of the term 'national innovation system' (NIS). Reijo Miettinen's analysis of how the NIS have developed in Finland can also be called paradigmatic because of his focus on the role of the NIS as a mobilising metaphor. Miettinen talks about a double development in that it has become a scientific term and a political term (Miettinen 2002). He introduces and develops: "...an epistemology of transdiscursive terms that are simultaneously and interactively used both by scientific communities and in policymaking". We believe that this a perspective that can provide our project with better tools to process changes in the relationship between research and society or science and politics, to produce more substantial, complex and integrated understandings and images of this relationship. By investigating concepts such as mode 2, the agora, post-normal science and technoscience as transdiscursive terms, we are able to improve our understanding of the convergence between research questions and policy questions. <28.>

Miettinen's text is valuable and can help enable both researchers and political decision-makers to achieve a much-needed reflexivity and more advanced practice. Miettinen discusses the extent to which Nordic social democracy and its political culture predestines political decision-makers and researchers alike to apply technocratic and pseudoscientific interpretations of the concept of NIS. However, it doesn't have to be so. Miettinen argues for a more modest way of relating by emphasising reflexivity, learning processes and contextual knowledge production. This is an echo of Haraway's situated knowledges and Jasanoff's technologies of humility: rather than seeking mastery and control, we should focus on collaboration with ambitions of developing modulations in the diminishing gap between variation and selection or between support and control (Rip 2002). <29.>

Why feminist technoscience studies?

The following foci within the research area feminist technoscience studies are particularly relevant for this project:

- Context-dependent development of knowledge and technology (e.g. Haraway 1997, Wagner 1994)
- Situated knowledges (Haraway 1997)
- Complex systems (e.g. Keller 1992, Harding 1998, Haraway 1997)
- Distributed processes of development of research and technology (e.g. Nowotny et al. 2001) <30.>

Methodological approaches

Research for change

The main characteristic of this project is that *the process is the product; the process is change*, and we are the participants. This is a non-linear procedure. The description above indicates that we want to investigate, query and change fundamental assumptions about research and politics and the relationship between them. We introduce figurations such as “situated knowledges” and “technologies of humility”, which suggest changes in the practice and procedures of knowledge. It is this connection between “life and learning” that we regard as the kernel of feminist technoscience studies (Gulbrandsen 1995, Trojer 2002). We do not intend to chart, unveil and expose barriers, obstructions and structures that impede gender equality in innovation systems, in order then to suggest special remedies and changes. Instead, we veer more the other way and believe there are limits to what we can understand before we try and implement changes (Harding in Gulbrandsen 1993). Change is challenging for all the parties in an innovation system and is not stimulated by focusing on the problems (Johnsrud 2000). We do not believe that finding the causes of a problem necessarily helps us solve the problem. We agree with Genevieve Lloyd when she claims that “What help diagnose a problem are not necessarily a suitable reaction to the consequences of it” (Lloyd 1995). However, if we focus on solutions and allow ourselves to be inspired by various future methods, such as “small wins” (Fletcher & Meyerson 2000), we may be able to address the question we often find ourselves confronted with: Is it possible to we have knowledge about the future? <31.>

Learning processes

No-one disputes that dialogue and participant-based procedures are gaining a footing in social sciences. Even text analysis and interpreting skills from the humanities are employed in an attempt to yield a constructivist understanding of knowledge combined with a wish to contribute to a more robust development of knowledge. However, dialogue and participant-based methods can seem rather programmatic. Institutional systems are full of fuzzy areas and things between the lines that are difficult to grasp, activate and study (Traweek 1988, Haraway 1997, Argyris 1991). Our contribution towards a functional and sustainable innovation system focuses on the preconditions required by good learning environments and learning processes. Our project manager’s expertise in adult education and experience from setting up NetPort.Karlshamn, along with experiences gained from establishing a new campus in Karlshamn and building up activities in basic education and research, lend the project a good basis for fulfilling its objectives. <32.>

Collaboration partners

The following partners took part in the project:

Blekinge Institute of Technology, Technoscience studies

NetPort Karlshamn

Karlshamn Municipality

Region Blekinge <33.>

Relevance

The relevance of the project is most clearly expressed in its starting point: the idea that innovation systems (IS) entail challenges for the collaborating actors – for the most part academia, industry and the political sector. The challenges are related to a much stronger demand for change. The challenges are particularly keenly felt by academia – in our case, the Institute of Technology – and its processes of developing knowledge. Concretely and systematically working on processes of cooperation for a sustainable and dynamic innovation system is highly relevant for the parties involved in the project: Blekinge Institute of Technology, Karlshamn Municipality, NetPort.Karlshamn, Region Blekinge and a number of companies. It is also extremely important for the project and the pilot study to point out that the arguments for the relevance of feminist technoscience studies as a resource have been recognised and accepted by the participating partners. <34.>

The project's focus on processes of cooperation using feminist technoscience studies as the basis for interpretation makes it possible to satisfy the basic preconditions required to achieve gender equality within an innovation system. The project helps develop a culture within an innovation system, which fundamentally and seriously strives to ensure women's and men's equal and necessary participation. <35.>

Since the design of the project means that it works in an extended circle of actors, it is deemed that results will be relevant, initially on the regional level, and probably also nationally. In the project, we stress the importance of context-dependence, meaning that while the generalisability of the results could be regarded as a valuable asset in the development of other sustainable innovation systems, ideas will have to be adapted and developed in local circumstances and conditions. <36.>

Continuous dialogue meetings between Blekinge Institute of Technology and NetPort employees

Work to develop functional and sustainable processes of cooperation within the innovation node NetPort has also served to refine what we call “kitchen cabinet” strategy. This way of working began when NetPort was founded in 2000, when the Institute of Technology and municipal NetPort employees moved into shared premises. Visions and guidelines were conceived and moulded in the shared kitchen that were crucial in ensuring a direction for the municipality's initiatives, the continued engagement of the cluster of companies involved, and the development of the Institute's new campus. The sudden increase in activities meant that for a short period we were temporarily localised in different premises. Once phase 1 of East Pier in Karlshamn was

completed, including all of BTH's campus activities, we could once again share premises. This is when we carried out the study. <37.>

During the study period, dialogue meetings took on two forms. The first form consisted of regular, short morning meetings of approx. 30-45 minutes, at least twice a week between representatives of the Institute of Technology and the head of NetPort. These morning meetings functioned as an invaluable information platform and served to keep the system running smoothly. They have made it possible to jointly analyse acute problems and find flexible solutions. Longer term issues have also been processed in these meetings, such as various external initiatives that require joint consideration, issues related to students' social activities, development of the rest of East Pier, new initiatives to develop companies and courses of education, major R&D projects that require solutions on several different levels, sharing experiences and development of knowledge, i.e. metacommunication to help us understand what we are doing and enable us to continue our innovation node activities more competently. This provides multifaceted strength and entails that questions that need to be formally decided by the management of NetPort can be processed efficiently and do not risk being put on the back burner. <38.>

The second form of dialogue consisted of a so-called contract group made up of representatives from the Institute, the municipality and NetPort. This group deals with the municipality's financial questions relating to research. The common vision for NetPort's profile area is linked with questions concerning distribution of the resources available for research at the Karlshamn campus. In this form of dialogue, the different actors' understandings of their respective roles in this advanced collaborative process that is NetPort.Karlshamn, are continually being tested and developed. <39.>

Round-table talks – Innovation systems from a local political perspective

The following round-table talks took place on Monday, 16 January 2006 developing experiences and challenges for the collaborating actors Karlshamn Municipality, Blekinge Institute of Technology, Private sector and NetPort.Karlshamn and the region. <40.>

The purpose of the round-table talks was to:

- exchange experiences gained during a five-year-long, triple-helix cooperation
- discuss in more detail the challenges faced
- look ahead and see how to engage with these challenges. <41.>

In the initial round of presentations, it was stated that the tendency in the municipal political sphere is a growing consensus concerning the importance of the innovation node NetPort. In the five years that activities have been underway, a change has occurred among the previously sceptical political parties, with one exception (the Communist Party KPML). "Even the Green Party admits that it has been a success." The NetPort director made the point that we are *implementing* a triple helix. Triple-helix collaboration has become an internalised function. VINNOVA representative underlined the importance of shared core values for a common future in the innovation systems supported by VINNOVA. VINNOVA's political framework is two-handed and is rooted in policy and bottom-up processes. At present, the time is right for two-

handedness. Cooperation without content is just empty words. Key words are user perspectives and non-hierarchical systems. <42.>

Three 30 minute topics

Elisabeth Gulbrandsen talked about the extent to which the challenges outlined in the original project application still apply, seen from a European perspective. She reported on discussions that took place in connection with the EU Commission's proposals for new initiatives for "Science & Society" in the seventh framework programme for research and technological development, emphasising that it is worrying to see how little impact the head of EURAB, Helga Nowotny's arguments for greater transparency, insight and openness in the research system have had. By contrast, this situation may motivate greater efforts to deal with the challenges that were identified and described in the application submitted to VINNOVA. Indeed, the situation may even result in opportunities to tell the story of NetPort.Karlshamn to the rest of Europe. <43.>

Sten Selander, who works in the broad field of the "Experience industry" (also known as the creative or culture industries), with a main focus on digital industries, observes that models designed on some kind of natural-science basis with static boxes and rubrics are incapable of shedding light on the complexity of these processes. These kinds of models are permeated by a belief that answers and solutions can be found, and that they are given and absolute. In the experience industry, by contrast, it is important to understand the dynamic that exists throughout the chain: from conceiving ideas, through financing, product / service development to delivery and payment. The experience industry operates with three main models: mass-produced experiences (digital), simultaneous experiences (live performances, concerts) and attractions (places, buildings, landmarks). The convergence between these models and their surroundings is dynamic and immediate. In the end, it is a question of construction of social and cultural processes that do not contain given answers or certainty; rather they are dynamic, interpersonal, driven by ideas and passions, and dependent on activity in the surroundings.

<44.>

Dan Sjögren claimed that VINNOVA's Vinnväxt programme is the first full-scale development programme for innovation systems aimed at sustainable regional growth. The factors that determine the success of regional development are the region's assets, the ability of the triple-helix actors to collaborate, the mindset of the individuals in the region and entrepreneurship and innovation capacity. Cooperation is necessary on a neutral platform, and it must be possible to talk about the future consciously. Comparative advantage = collaborative advantage. Short turnaround time make processes possible. It is a collaborative ecosystem. The ability of initiatives to lead to innovation is directly linked to process capital and structure capital. It is therefore no coincidence that Vinnväxt projects focus on process management, non-undercritical financing and process development. Support presupposes needs-based and user-directed exchange of experiences, learning and development of know-how for process leaders in interplay with strategic programme activities. <45.>

Experiences and challenges for the collaborating actors

Initially, the discussions dwelt on the course of events that led to local and regional growth and the preconditions they required. We agreed on the importance of the ability to work together where strategies are built up along the way with shared administration of the vision. <46.>

NetPort has been established, and the main challenge now is upgrading and how this is to be organised and structured. Which competencies does upgrading require? Regardless, it is the network model that is used with ongoing, often informal dialogues. The underlying value is the will to develop. Network logic entails that newcomers to the project add new elements to the collaboration and help illuminate the underlying core values. Another concrete skill required is the ability to make sure that the three existing profile areas for innovative development and convergence are sufficiently elastic. Upgrading increases the need for metacommunication. <47.>

The main challenges right now are related to NetPort's presence at the 2009 World Congress in the profile area ITS (intelligent transport systems and services), and how experiences can be exploited on the local and regional levels. Karlshamn Municipality needs to keep up at least the same rate of development as before, to maintain its focus, be prepared to provide long-term support, and to preserve a strong political foundation. For Blekinge Institute of Technology, the main challenge is to develop and anchor process competence in the existing triple-helix cooperation. This is in itself a major change and challenge within academia. <48.>

The round-table talks ended with general agreement that there is a huge need for these kinds of talks, which should be used as an introduction to subsequent meetings and seminars for reflection and metacommunication. <49.>

Interviews – Innovation systems from a regional-political perspective

In order to cast light on current views on innovation systems on the regional level, the two most senior representatives of the region – the head of Region Blekinge and the county governor – was interviewed. <50.>

Region Blekinge

Region Blekinge (RB) was formed on 1 January 2001, and on 2 January 2003 was made a “county coordinating body” according to the new Act on county coordinating bodies. This entails that Region Blekinge takes over responsibility for regional development from the county administration. Region Blekinge thus has the entire political responsibility for development in Blekinge. This is manifested by RB representing the region's inhabitants in important questions concerning growth and development in Blekinge (see www.regionblekinge.se). <51.>

The regional growth programme is one of the instruments used to realise “the Strategy for Blekinge”, which is Blekinge's regional development programme. Here RB concentrates on what needs to be done to ensure companies the best possible conditions to increase growth in Blekinge. RB has defined a number of focus areas to this end, namely: Entrepreneurship, business and the economic climate; Learning and the workforce; Cluster and innovation systems; the Southern Baltic area; and Infrastructure and attractivity. The current programme runs until 2007, but is subject to review each year. A new programme is to be designed to coincide with the EU's new programme period, i.e. 2007–2013. <52.>

Thus, Region Blekinge enters a new mandate period on 1 January 2007. RB has suggested focusing on three areas:

- Blekinge's regional political representatives
- Sustainable growth and development in Blekinge
- Collaboration within and outside Blekinge

Gender equality and the environmental issues are horizontal tasks that dissect all activities. <53.>

Region Blekinge and innovation systems

At present, regional innovation systems are regarded as a rather abstract affair. The operational development of innovation systems occurs on the local level, resulting in a concrete regional innovation system. RB's role is to ensure in a number of different ways that the basic conditions necessary for the operational innovation systems and their needs for collaboration across the region are in place. Blekinge Business Incubator (BBI) plays a significant role in this context. One of the most important elements that is administered on the regional-political level is the region's infrastructure. In collaboration with Blekinge Institute of Technology, RB has developed Blekinge Innovation Modell, describing the way through the structures in Blekinge that support innovation. <54.>

The regional profile (i.e. Blekinge as an IT region) is still relevant. However, it is an IT region with other characteristics too. These other characteristics are beginning to show and are closely linked to areas of activity and qualities specific to this region. <55.>

The main innovation nodes in Blekinge are SoftCenter in Ronneby, TelcomCity in Karlskrona and NetPort Karlshamn. The latter two have the greatest degree of activity. They are regarded as important and draw attention to the region both locally and farther afield and have even helped the region make an international name for itself, as well as being good examples of implemented innovation systems, where politics, academia and industry work together in reality. The significance of the innovation nodes for the region's standing and collaboration within the EU cannot be overstated. Region Blekinge is a member of eris@ (European Regional Information Society Association), as a result of which RB is involved in the pan-EU project MERIPA – Methodology for European Regional Innovation Policy Assessment. <56.>

Region Blekinge and gender equality

In 2004, the regional administration decided to set up and finance a regional resource centre for women in Blekinge (RRC Blekinge) with a view to promoting growth in Blekinge. Besides Nutek, the Centre is currently being financed with funds from the EU Structural Funds, objective 3, the county administration in Blekinge and RB. Resource centres function as a platform or meeting place where women can present projects and development work on the basis of local needs. Resource centres work on the national, regional and local level and have been set up in some 150 places in Sweden. The long-term goal for the regional resource centre is to contribute to women and men having equal influence on work related to regional development and to improve women's position in industry by increasing the number of business women. <57.>

On the regional level, it is difficult to find a functional and relevant role for RRC. It seems it might be better to invest the available resources on local resource centres instead. The main

problem is the belief that women's business ventures can be financed with pin money. Resources are so scarce it seems it is more about keeping up appearances than actually achieving very much. This has meant that RB has chosen not to apply for funds from Nutek to continue RRC Blekinge for a third year. We need better visions based on a fundamental view that both women and men possess competencies and qualities that should be supported and developed. The head of Region Blekinge is a great believer in the power of good examples in efforts to develop a vision. For the remainder of the project period, work on RRC will continue, despite the limitations mentioned above. <58.>

County administration

The county administration is an extension of the central government, but at the same time it also aspires to be more than just a watchdog. The promotional aspect of the supervisory tasks is the most interesting. Region Blekinge is responsible for regional development, but the county administration also shares some of the responsibility insofar as regional development is achieved by many actors working together in partnership. Regional development aims at sustainable development. Three basic goals dominate: gender equality, public health and a multicultural society. The county administration's goal for Blekinge specifically until 2007 is to build up an image as an authority that works for sustainable development. In order to achieve this goal it is necessary to create understanding about the point of this ambition and its long-term consequences, in addition to clear governance. <59.>

The county administration and innovation systems

The county governor stressed the importance of clearly defined core values for the authorities and businesses. Integrating technology into people's everyday lives, not least in people's homes and improving the quality of life for senior citizens, is often synonymous with creating innovations. For example, innovations to promote regional development could be developed by bringing students from very different courses of study together and getting them to work on a regional development project together. <60.>

Even from the county administration's point of view, Blekinge can still be regarded as an IT region. However, we do need to define more clearly what we mean by IT today. It is increasingly important that technology forges links with elements of everyday life, i.e. with its areas of application. Regarding IT as communication means companies have almost unlimited potential for development. The needs are endless, especially for the ageing population and in various educational contexts. A broader view on the use of games in teaching would also pave the way for new companies and jobs. The example was given of linking police training with game development. <61.>

The county administration and gender equality

It is very difficult to achieve gender equality in regional development and innovation systems. There are no easy recipes or strategies to turn to. Many different initiatives have been tried, but few result in sustainable changes that increase equality. The current motto for development work "Blekinge for all" was devised from a planning process in which no women were involved. Only a handful of women can be found in political spheres and other contexts where guidelines for some of the most important issues for the county (transport, infrastructure, regional

development) are drawn up and the basic preconditions are formed. We need artificially mixed groups in all these areas. <62.>

Can women be enticed into getting involved in issues concerning transport of food products? We have seen an increase in the number of small local dairies and abattoirs set up by women. This must be seen in light of the fact that major structural changes are encouraging the tendency for Sweden to send its livestock to abattoirs in Poland, trusting that we get the same meat raised in Sweden back again from the Polish abattoirs that handle meat from several different countries. < 63.>

Can women be enticed into getting involved in issues concerning energy use? If we take as our starting point situations where women are found and have special expertise, would this lead to qualitative contributions towards more sustainable and efficient energy consumption and thus to technical solutions? <64.>

Design is one area that does seem to attract women. Just imagine the possibilities within the design and functionality of mobile phones if the needs of women and the elderly were afforded greater focus. <65.>

Vinnväxt project from a gender perspective

Background

This mini study is based on material published on Vinnova's website (www.vinnova.se), readings and analysis of a number of applications submitted to the Vinnväxt programme, conversations with two local / regional actors in Blekinge, and the author's own comments and reflections. <66.>

The purpose of this text is to discuss Vinnova's Vinnväxt programme from the angle of gender equality: how does Vinnova include gender-equality perspectives in its instructions? How was gender equality dealt with in the applications received? I then study Blekinge's application in more detail. <67.>

This study consists of four parts. The text starts out with a short description of the Vinnväxt programme and Blekinge's Vinnväxt application 'Wireless connections'. Next, Vinnväxt 2004 is discussed from a gender-equality perspective, and three project applications are outlined. Then follows a presentation and description of the document sketching ideas concerning gender equality in Blekinge's planned project 'Wireless Connections'. The study concludes with the author's reflections on the assignment "Vinnväxt from a gender perspective". <68.>

The Vinnväxt programme

The Vinnväxt programme was conceived to provide long-term (10 year) funding to develop regional innovation systems. According to Vinnova's own guidelines, these systems could be classified into three 'general, overarching groups of initiatives': 1) international competitiveness, 2) regional areas of expertise 3) existing or potential projects. This results in a mesh of assessment criteria for the submitted project applications. Vinnova also emphasised that projects

had to include factors that document growth potential and triple-helix (collaboration) ideas. <69.>

In the list of obligatory main headings and subheadings for applications, there is a section under the main heading 'Action plan for execution of the project', subheading 6.3 'Ensuring women's and men's involvement and utilisation of their special competencies'. <70.>

Seven of the applications for funding received in 2003 were selected as "being considered promising, but needing further development" before the next round of applications, Vinnova 2004. They were dubbed the '7Ups'. The 7Ups consisted of Blekinge's application 'Wireless Connections', 'Life's new tools' (Linköping), 'ReFine' (Jönköping), 'Biomedical development in Western Sweden' (Göteborg), 'Fiber Optic Valley' (Hudiksvall), 'The growth factory' (Lund) and 'Triple Steelix' (Dalarna). Three projects were granted funds of SEK 10 million over ten years in 2003: 'Innovation in the borderland' (Skåne), 'Robot valley' (Mälardalen) and 'Uppsala Bio' (Uppsala). <71.>

Four of the '7Ups' projects were granted funding in the second round of application: 'Biomedical development in West Sweden' (Göteborg), 'Triple Steelix' (Dalarna), 'Fiber Optic Valley' (Hudiksvall), 'Life's new tools' (Linköping). (<http://www.vinnova.se/Main.aspx?ID=20a0eef4-f7c2-4201-9f5a-a997e06f1b1c>, [2006-02-16]). Blekinge's application did not receive continued or full project funding. <72.>

Commentary 1:

On the basis of the text of the call for proposals, one could draw the conclusion that Vinnova does not regard gender equality as a goal in its own right, but rather as a means to achieve the strategic goals (growth and robust innovation systems). At the same time we note that the triple-helix model, which could also be seen as a means to achieve the strategic goals, is afforded special attention. The submitted applications that included a triple-helix model were given added weight when the applications were being sorted and categorised. Triple-helix collaboration is one of the decisive, special and determining factors. How particular factors are interpreted as a means or an end is thus not at all clear in Vinnova's directions. Ending up as one subheading among 21 other subheadings would seem to imply that gender equality is not that important. Nevertheless, it must be noted that the instructions lay down that gender-equality issues must be explicitly included in the projects' action plans. This suggests that Vinnova attaches a certain importance to the gender-equality perspective in connection with the executability of the projects, along with issues of management and resources, to mention a couple of the other obligatory subheadings that must be dealt with in the applications. And so we find ourselves back at our earlier discussions about separatism versus integration. According to Vinnova's interpretation, gender equality is a separate issue in its own right and not, for example, an element of management. Gender equality is made a separate issue. <73.>

Blekinge & Vinnväxt

The application that Blekinge submitted to Vinnväxt in 2003 and again in 2004 was called 'Wireless Connections'⁵. Using the existing local innovation nodes as its starting point, the project aimed to develop Blekinge as a region of growth and innovation with expertise in

⁵ This description and analysis is based on the Vinnväxt 2004 application.

wireless IT applications. This project idea was the brainchild of a group of people including the existing local network organisations, three municipalities in the Blekinge region, Blekinge Institute of Technology and a number of IT companies that operate in the region. <74.>

Reading the project application with a focus on gender equality, I found one (1) section where gender equality was mentioned explicitly. It is stated that: “developing technology is a male-dominated field, and this dominance increases the higher up the hierarchy you go... By focusing attention on certain types of applications, companies with a higher proportion of women will be included. Social diversity in terms of people’s education, ethnic origins and gender generates friction, which promotes innovation.” This section ends with the following statement, which can be taken as a conclusion and guideline for future activities: “For this reason, the actors in the project are very keen to promote development of social networks that encompass creative diversity.” <75.>

Commentary 2:

The project application can be read as an expression of the will to create something new, find new ways, break down boundaries, bravely set forth towards an unknown future. There is also a great belief in the region and its rightful place among international technology actors. This place has already been created to a certain extent; now it is not only a question of holding on to its position, but also moving onwards and upwards to become a pioneer and model. Innovations can be created by people joining forces and processes of cooperation. For new ideas to flourish we need everybody’s participation; diversity is a means to innovative thinking, processes and products. <76.>

But which forces take the initiative and lead the development? Firstly, all the people in top positions are men and indeed men who already hold a leading position in the existing structures. This guarantees anchorage in the region’s organisations, which are regarded as key actors within IT. At the same time there is also cause to ask why the application does not open up this leading sphere to new actors and a new diversity. There is evidence of the dream of something new in the formulations used in the application, but it seems not to want to reach into the arenas where decisions are made. There is of course no opportunity to query the existing leaders’ competencies regarding innovation and propensity for change. But if the entire region is to be involved, and everyone is to participate, and if diversity is to be the means, then why not take things one step farther right from the very outset and include new, unexpected actors and create exciting mixes of people with different experiences. Whatever might be lost in terms of stability would be more than made up for by a positive instability. <77.>

The decision to weave the gender-equality perspective into the diversity perspective, as has been done in Blekinge’s application, may be the result of several different factors. In recent years, the term “gender equality”, with its focus on women, is tending to be replaced by “equal opportunities”, to also include an ethnicity perspective. This may have affected Blekinge’s active use of the term diversity. Another reason for this may be a conscious decision to avoid focusing on gender equality. This may in turn be due to the main actors involved in preparing the application and their interest in and actual knowledge about gender equality. This lack of interest in or conscious effort to avoid the gender-equality perspective may also depend on the view one

has of gender-equality issues. If gender equality and gender-equality issues are perceived as never-ending problems that are raised again and again without ever finding any positive solutions, then we can understand that in a context where men are seeking ways to create a positive and innovative future, gender equality does not appear to offer anything positive or useful. <78.>

Gender equality & Vinnväxt

The Vinnova / Vinnväxt website has a special page called ‘the gender-equality perspective’ (www.vinnova.se). Here it is stated that “VINNOVA takes active steps to integrate a gender-equality perspective into all its undertakings and to develop a particular focus on promoting equal opportunities from a gender perspective in order to develop tools that can strengthen the innovation system. Reading to see how gender equality is treated in the applications in the first call for proposals in the VINNVÄXT programme revealed an almost total lack of gender perspective.” <79.>

In connection with the second round of applications in 2004, a special call was made to the projects that had been granted funds to develop their proposals in the first round in 2003 – the projects that VINNOVA called the 7ups, asking them to describe in their next application how they intended to ensure that the gender-equality perspective was included. The purpose of this was twofold: partly to encourage the winners’ efforts to develop their applications in this area, and partly so that the results of the gender-equality projects could help other applicants’ efforts to integrate a gender-equality perspective into their applications. Thus, it was also an objective to act as a pioneer and develop new tools to promote gender equality. <80.>

All the 7ups accepted the challenge and submitted new applications. Three projects were granted SEK 200 000 each to develop their ideas and produce a description of their work in three months. The final reports were to focus in particular on how they had designed their work to ensure that this would subsequently be able to help others that intended to submit an application in the second call for proposals in the VINNVÄXT programme. <81.>

The three projects that were granted funding were Fiber Optic Valley, the Growth Factory and ReFine. These projects submitted reports at the end of February 2004. What these three projects have in common is that they “presented strategies that underline the need to nurture all the competencies found in the regions, and they have involved other regional actors in the work.” (<http://www.vinnova.se/main.aspx?Id=5E42DAB5-B412-4974-A175-8899BEDFA763>, [2006-02-16]. Blekinge’s gender-equality application was not among the applications that were granted funding. <82.>

Commentary 3:

The three submitted applications all ask two fundamental questions: Why gender equality? And how to achieve gender equality? <83.>

Although the three applications (ReFine, Fiber Optic Valley and the Growth Factory) do not use uniform vocabulary, they do share a number of common traits: a link between gender equality and growth, processes of cooperation, and the wish to integrate the gender-equality perspective into the main project. Thus, they all provide the same answer to the question why: nurturing

everyone's special skills and developing new competencies will guarantee the future development of the region. In addition, they all agree that there is currently a lack of gender equality in many key areas of society and business. It is these deficiencies that the planned projects with their explicit focus on gender equality are to address. The purpose of this is not merely to increase the number of women, for example in technical education and in top positions in industry ; rather these measures are seen as a means to increase growth, broaden industry in the respective regions and revitalise enterprise. Change is necessary, and these changes require everybody's efforts and contributions. <84.>

All the applications also contain a number of concrete proposals as to how work to promote gender equality is to be carried out and evaluated (checklists for assurance, indicators for assessment). These proposals are all relatively concrete, and some of the ideas are quite innovative and original. All the proposals also suggest activities for implementation: ideas on how to recruit more women to technical courses of study and mentoring programmes, to quote two examples. These are tried and tested methods. However, there are also some more innovative ideas, such as, for example, the suggestion to introduce gender certification of companies. They also ask: who is to carry out the work? Here, the marked need for mainstreaming is identified: project managers are responsible for gender-equality issues and may turn to working groups and extra processes for support. <85.>

What remains to be seen is whether these good and often new innovative ideas to promote gender equality have in fact found a footing (or are in the process of taking root) in Hudiksvall and the Södra Norrland regions, where the project "Fiber Optic Valley" is underway as one of the Vinnväxt projects that was granted long-term funding. One question that begs an answer is: how is work related to mainstreaming gender-equality issues and developing methods coming along? Or has most attention been given to the elements of the project that are concretely aimed at women? <86.>

Blekinge & the gender-equality perspective

So, Blekinge submitted its application with a specific focus on gender equality. This application was called "Wireless Connections – Pilot project for learning about gender-equality perspectives within Vinnväxt 2004". The project idea is rooted in the processes of transformation we are seeing in the Blekinge region in connection with the region's evolution from a traditional industrial region to an IT region. The application describes this transformation from a gender-equality perspective and comes to the conclusion that the changes the region is undergoing should also be described and analysed from a gender-equality and feminist perspective, the implicit message here being that this kind of analysis has not been done before. From this rather retroactive perspective, it is also claimed that lessons can be learnt from the region's history that can be useful in work to shape the future, for example, in connection with the regional growth programme. The application expresses a will and desire to introduce gender-equality thinking generated in connection with the current initiative into the practical implementation of the regional growth programme. The application also makes connections to other regional development work, which grows through triple-helix cooperation, emphasising dynamic relations between academia, politics and industry. The gender-equality perspective is believed to be able to revitalise and strengthen these processes of cooperation. <87.>

How is the need for a gender-equality perspective discussed, defined and motivated in Blekinge's application for Vinnväxt funding? <88.>

It is explicitly stated in the application that the gender-equality perspective can add valuable components to growth in the region. The application refers to the 'growth potential'. Efforts to promote growth require input from everyone; diversity will guarantee breadth in the participating actors. Diversity and gender equality are seen as closely related. Gender equality will help increase diversity, which will in turn ensure better possibilities for growth. Growth both requires and creates new possibilities for entrepreneurship and enterprise. The application states that more women are needed in the areas addressed in Blekinge's Vinnväxt application 'Wireless Connections': telecommunications, IT, mobile services and mobile communications. At the same time, the application points out that gender equality is not 'exclusively about women'. It is not simply the case that women lack certain important competencies; rather, competence development should also encompass men. In this way, the application prefers to treat the gender-equality perspective as an element of the diversity perspective, as opposed to regarding the gender-equality perspective as being about women's rights or gender issues. A continuation and clarification of this extended meaning of the gender-equality perspective entails that the application wants to define gender equality as learning. Unfortunately, what the application means by learning remains unclear: is it a question of developing the competencies of both women and men within IT, or is it more a case of developing competencies concerning gender equality, or maybe a case of both aspects at the same time? <89.>

In the section of the application outlining the execution phase, it is suggested that gender-equality ideas be integrated into the original Vinnväxt application and its approaches. However, this short gender-equality application also stresses the need to set up a 'Task Force' to 'produce concepts and tools to help more women get involved in, for example, development of new business ideas, innovations concerning financing and presentation of ideas to secure risk financing and build sustainable business relations'. These tasks can be regarded as a concrete implementation of the abstract idea of gender equality on the basis of a learning perspective. 'A learning model is needed for gender-equality work', as the application puts it. <90.>

Commentary 4:

Despite the fact that only the first application / outline of ideas from Blekinge is available for analysis, there are still two other matters worth drawing attention to and reflecting on in Blekinge's gender-equality application:

- 1) gender equality: focus on women vs. all / diversity
- 2) special parallel activities vs. integration in the Vinnväxt application <91.>

The application reveals a clear tension between differing views on gender equality. On the one hand, they do not want to be seen to be linking gender equality to women; on the other hand, activities aimed specifically at women are proposed. The application states that it is more important and meaningful to think in terms of "everyone": that regional growth can only gain by including everyone's experiences in the processes. In this way, the processes can profit from a wealth of views and angles – what the application calls diversity. Thus, gender equality becomes

a subcategory in the category of diversity. At the same time, when the application explicitly discusses gender equality, it talks about women and parts of the project aimed at women. We can interpret this tension as existing in an intermediate realm between the traditional view on gender equality, which usually focuses on the representation of women, attempts to make women more visible and create specific arenas for women, and the view that gender equality is not (only) about the number of women or special treatment for women; rather it is more a case of trying to see gender equality as an inherent part of the development of activities. We have plenty of experience of and knowledge about the traditional understanding, which of course also facilitate thought and development of ideas in the new gender-equality context. However, conceiving of gender equality in terms other than quantity and representation is much more complicated and revolutionary. There are few tools and good examples to turn to. And tools and good examples are exactly what we need for gender equality to take a step forwards and also encompass content and direction. <92.>

Even the task force formed to lead the gender-equality work in the Blekinge application consists of women only. We find the same imbalance when the application discusses the necessity of integrating the gender-equality perspective into the application 'Wireless Connections' and at the same time proposes separate and parallel activities. Once again, the tension is there: must we always end up in the same old gender-equality traditions despite our best intentions? Women need to be included, but does it have to be in their own arenas led by other women? This has little impact on other structures. Women still "own" gender-equality issues, and it is through measures aimed specifically at women that gender equality can be created. <93.>

Concluding reflections

Adding women – increasing the number of women

For a long time, work on gender-equality issues has focused on women, and in particular on the absence of women in certain areas and making "overlooked" women visible in certain other areas. As a result of the findings of studies, investigations and surveys, projects and activities have been developed and carried out to encourage women to take male-dominated courses of study, especially within technical fields, or to increase the number of female politicians in various decision-making bodies, to name a couple of examples. The goal has always been quantitative: adding women and increasing their number will lead to a more even representation of the sexes and ultimately a more balanced society. <94.>

Nurture women's experiences as part of the diversity that enriches and introduces new competencies and knowledges

As a complement to quantitative gender-equality goals, the need for women's participation and involvement has also been motivated by more qualitative factors. The quality of activities improves when more competencies, knowledges and experiences are drawn upon. So we need women and their special and specific experiences. This discussion sometimes assumes a direction that resembles an essentialist view of women. Women and men are different by definition, and the input and participation of both are required to find a functional balance in working life. <95.>

Special arenas for women – women’s own agency and action

Another school of thought has advocated activities and networks aimed exclusively at women, for example local and regional resource centres for women, networks for female managers, etc. Women need “a room of their own”, partly in order to be able to safeguard and nurture their existing competencies and partly in order to be able to develop new competencies. In the most extreme and rigid form of so-called radical feminism, the goal was to create separate arenas for women alongside those for men, which were felt to be destructive. According to this view, women stand for softer, more care-oriented perceptions and values. In the Swedish gender-equality tradition, it is more apt to interpret the various special arenas for women as training grounds where women can prepare to move into more masculine and male-dominated domains. <96.>

The unexpected that steps over boundaries and does not exclude the first three alternatives, but wants to go farther...

Feminist technoscience studies discusses possibilities for the future that are situated outside the established gender-equality positions. In a society as dependent on technology as this area of Sweden is today, it is no longer sufficient merely to count the number of human actors. What we need is a more serious and engaged stance and participation in the actual production of technology. Standing on the outside is not an alternative; instead we must position ourselves ‘in the belly of the beast’ (Haraway 1997). Being involved in creation and practice presupposes knowledges, engagement, a critical way of relating, and also imagination, open enquiry and taking risks. Technology does not have any intrinsically given direction; rather the direction developments take is decided through negotiations and in different constellations where human and non-human actors interact. Daring to think beyond the given framework – being innovative and accepting responsibility in an undefined, non-standardised way requires an entirely different view of technology and its role and position in our everyday lives. <97.>

And how was it in Blekinge?

Blekinge’s Vinnväxt application contains traces of all four movements or directions within gender equality. Separate arenas aimed specifically at women are proposed in the separate gender-equality outline in particular, but the need for them is motivated by the fact that the project as a whole needs diverse competencies and knowledges. The direction within gender equality where the application is most cautious is the strategy of increasing the number of women. This becomes clear if we take a look at the project organisation. Women are to participate within their own arenas, but their knowledges are welcomed. However, these formulations are very vague in the main project application. <98.>

In one interpretation, the strategy of using innovation and crossing boundaries to ensure gender equality is the dominant direction in the application. This interpretation is founded on the context in which the application was produced: future innovation systems linked to regional growth. Nevertheless, it must be admitted that the application does not break down all the conventional boundaries: for example, the project management is made up of established, major actors. Diversity and ‘a broad spectrum of activities’ are mentioned, but the real question is in what

ways is the application innovative in its ideas and proposed products if we look only at the actors involved and the content. In parts, the application is very open in its formulations and speaks of different groups of actors. In this way, no-one is excluded, but nor is anyone actually invited to get involved. <99.>

The same imbalance or tension also dominates the view of technology. The application states that 'a global mobile phone system and local wireless networks are the foundation on which an incalculable number of new products and services are to be developed'. The framework maybe given, but it is wide and open. A number of words that keep cropping up in the text (growth motor, change, dynamic) indicate trying and searching, but also determine that the way to a successful future can be created through preformulated plans and that the goal is given. This conflict – searching for something that does not exist and at the same time guaranteeing a commercially and economically sustainable end result – is probably largely due to the fact that the work is to be carried out in the form of a project financed by an external actor. Combining uncertain and certain elements is a tricky business. <100.>

The next challenge is to open up the arenas to many different actors from the very earliest stages, including actors that do not belong to existing networks. This requires developing new methods focusing on participation. It is to be hoped that inclusion of new actors will broaden ideas about technology and its applications. The report 'Women's images of Blekinge: a report from the project 'Women's visions of the future of Blekinge' from 1998 painted a worrying picture of the future of Blekinge. Women felt they had no say in the development of the region and were very reserved about the measures that Blekinge has invested so much economic and technical capital on in recent years. This concern could be transformed into active participation through conscious gender-equality measures. <101.>

The main challenge for the future is forging links between the gender-focused equal-opportunities perspective and the development of content. In the same way as we have to conceive of agency outside the usual structures, we must also think of technology and its content beyond the fixed definitions. At the same time, the 'black boxes' must be opened from several different standpoints. One of these black boxes contains perceptions about women's lack of interest in and knowledge about technology and IT (see for example the reflections of the Swedish Gender Equality Council for Transport and Information Technology, Jämit). However, this analysis can be overthrown depending on how technology and technological know-how are defined. Drive and knowledge can be found in many places we are not used to looking for them (see, for example, Elovaara, 2004), but they are not always visible in the dominating view of technology. <102.>

Incorporating new procedures and ideas into society's decision-making and financial structures requires openness and taking risks in local, national and international arenas. <103.>

Short study⁶ of innovation systems in an EU perspective

Introduction

The number of “buzz-words” bandied about in the European debate on innovation systems has only increased since winter 2005. There are myriad trendy phrases based on terms such as mainstreaming, partnership and network; governance challenges are said to be all about a shift from “vertical segregation to horizontal integration”, about “new modes of STI-governance” and “integrated approaches”. In May 2005, Catherine Lyall and Joyce Tait published a book on research and innovation in a European perspective: *New Modes of Governance*. By way of introduction, they point to the increase in the number of new buzzwords and draw the following conclusion about management of processes of research, technology and innovation: <104.>

However, there is arguably less integration in this area than in many others, and, so far, there has been little guidance on what integrated policies would consist of and how they might be delivered.

We interpret the increasing frequency and distribution of buzzwords as a sign of the growing need for change, and a call for more attempts to realise change – in practice and as a culture – in the European arena. This development also provides an interesting perspective on NetPort.Karlshamn as a development organisation. <105.>

NetPort.Karlshamn in Europe

The Swedish government was one of the first in Europe to distribute the central research-policy task of developing the relationship between research and society. This means that for quite some time now the Swedish research system has had to deal with challenges related to collaboration in the form of the “third task”. In the Act on higher education that came about partly as a result of the somewhat controversial legacy left by Carl Tham⁷, universities and colleges are obligated to collaborate with the political authorities, trade and industry and civil society.⁸ This was also a signal that the changes needed in order to develop the relationship between research and society could not follow more established, centralised procedures for policy development. Efforts to enhance collaboration, especially in the form that they have developed at the new profile colleges, have been subject to discussion, assessment and international comparison, not least through the HSS conferences (Högskolor och Samhälle i Samverkan [Higher Education and Society in Cooperation]). This work has had a trickle-down effect on research communities’ own strategic work and policy development. After a period where emphasis was placed on development and implementation of special instruments for collaboration, difficulties were had initiating the necessary processes of change. Now there are attempts at developing more interactive research processes, inspired by, for example, action research, and where

⁶ This study consists of a review of the preparations for an application to VINNOVA in April 2005: *Processes of cooperation in innovation systems*, and a review of different countries’ positions on the Commission’s plans for development of the 7th framework programme, with a special focus on activities proposed under the heading “Science & Society”. Participation in two ERA-Nets established for development of the European research and innovation system (ForSociety and ERASAGE) enables discussion of some of the central challenges formulated in the application. A draft report was discussed with key actors in NetPort.Karlshamn in January 2006.

⁷ Government proposition 1996/97:5, *Research and Society*.

⁸ The amendments to the Norwegian Act relating to Universities and Colleges, by contrast, were not introduced until 2002 and were much less demanding in terms of how governance of this central research-policy task is distributed.

recommendations veer towards establishment of various forms of more permanent development organisations in research systems.⁹ <106.>

Still bearing in mind the prevalence of buzzwords and the European perspective, it is nevertheless worth asking whether the local level is in fact the only possible level for the developments and changes required to increase the impact of research and technology on societal developments and innovation. The horizontal, distributed forms of governance proposed by the buzzwords mentioned above cannot be developed from the top down nor from the bottom up. They are, as we underlined in our application, fundamentally non-linear and interactive. <107.>

Science & Society towards the 7th framework programme

Being involved in these kinds of more horizontal partnerships is, as we have emphasised, quite challenging for expert systems in general, and perhaps especially so for academia, which have to shed its cloak of assumed neutrality and objectivity and create for itself a new role as a visible and powerful actor in society. This challenge is partly a consequence of research's growing impact and "success". Research is increasingly involved in every aspect of life. There can be no doubt that research plays a crucial role in the development of industry and commerce¹⁰, it affects our decision-making processes, it colours our culture and steers the development of society. However, research and technology not only have an integrating effect on the development of society; research and technology are also always already *integrated into* the development of society in general. The suggestions and discussions that evolved in the wake of the EU Commission's proposal for its 7th framework programme in autumn 2005 indicate that this perspective needs *even greater emphasis*. Or to put it another way, society also influences the processes of developing research and technology. Focusing on "society in science" will thus be at least as important as "science in(to) society". The EU Commission's proposal for new initiatives in the 7th framework programme is called "Science in Society". There is little in the proposal and the ensuing debate that encourages a focus on "society in science". The Commission's text still reflects an underlying understanding of research policy as bifurcated and linear. The discussion of the problems associated with a bifurcated, linear understanding that we develop in our application (pages 6-8) is thus still highly relevant. We also point out that this perspective must be supplemented by more interactive paradigms. <108.>

Other voices

Helga Nowotny, a central figure in European research policy and head of the European Research Advisory Board (EURAB), has for some time been calling for a greater degree of reciprocity in the relationship between research and society, arguing that this partnership presupposes more transparency concerning the processes involved in research and technology.¹¹ It is therefore both curious and disappointing that the Commission's text so one-sidedly emphasises activities designed to ensconce technology and research *into* society. By contrast, Nowotny argues that now it is the research system that need to be opened up, and she believes it is particularly important to be able to communicate "uncertainties, contradictions and contingencies" – everything that cannot be assured as "scientifically" proven and which therefore turns the

⁹ See, for example, Brulin et al. "Interactive Knowledge Formation, a Challenge for Swedish Research and Higher Education", paper HSS 03, follow the link to papers at www.BTH.se/exr/hss03.nsf/

¹⁰ Reference to last year's research proposition.

¹¹ See for example *RTDinfo*, November 2005.

spotlight on the idea of science / research / technology as based on neutral and to a certain extent “objective” knowledge processes. “A new kind of more mature partnership” needs to be developed, Nowotny claims, and this can only be achieved if the processes whereby research and technology are developed are opened up: <109.>

Science can no longer expect unconditional support on the part of society for whatever it wants to do, nor unconditional acceptance of its authority. Society will have to become more involved in understanding better *how research actually functions* and why it is important. (our italics)

The same tendency is also evident in the United Kingdom, one of the leading countries in Europe in terms of development of the dialogue between research and society. Here, focus is increasingly on the actual process of developing research and technology.¹² This shift is described as “upstream”, and *Demos* positions the challenges thus in *The Public Value of Science*: <110.>

Those who see upstream engagement as a means of providing earlier and better predictions of risks and impacts are missing the point. It is not a matter of asking people, with whatever limited information they have at their disposal, to say what they think the effects of ill-defined innovations might be. Rather, it is about moving away from models of prediction and control, which are in any case likely to be flummoxed by the unpredictability of innovation, towards a richer public discussion about the visions, ends and purposes of science. The aim is to *broaden* the kinds of social influence that shape science and technology, and hold them to account. (our italics)

“Upstream engagement” refers primarily to the reflexivity of the research and technology systems, according to Brian Wynne. The requirements that knowledge must be *socially robust* will only continue to grow in the years to come. The conditions necessary to create a constructive dialogue with society¹³ seem to be rooted in the increased ability of the research system to open up and admit the limits of its knowledge. This is necessary for research to be able to invite collaboration with other social institutions. The same demand to be able to open up and admit one’s limits also applies to interdisciplinary work. One of the main challenges facing efforts to nurture interaction between research and society relates to inviting other parties to participate in dialogue in ways that make it possible and interesting for other central social actors to be involved and engaged. Developing the dialogue with society requires major changes in expert systems in general and the research system in particular.¹⁴ One of the challenges lies in “bringing out the citizen in the researcher”. Wynne¹⁵ points out that this kind of understanding is just hatching: <111.>

¹² There is a good general introduction in recent years’ publications by the think-tank *Demos*, for example *See-through Science* and *The Public Value of Science*.

¹³ The social dialogue or “Public Understanding of Science and Technology” (PUST). See the STAGE-network for some good discussions of developments in the field of PUST in Europe.

¹⁴ Reference to the concepts of co-production / co-evolution and Sheila Jasanoff’s application through the figure “technologies of humility” where she explicitly also addresses the challenges in relation to policy-designing institutions.

¹⁵ Wynne in the preface to Sue Weldon: *Public engagement in genetics: a review of current practice in the UK*, Lancaster Univ. Nov 2004.

The only recently recognised challenges of two-way understanding between science and its publics, replacing one way understanding of science, are in their very earliest days. This is emphatically a long haul, of nurturing not merely policy shifts, but *profound cultural change* in such science fields, their policy and technological uses, and the assumption underpinning them... The bottom line issue in the new climate of “public engagement” is not just seeking earnestly for ‘public inputs’ – preferences, values or knowledge. It is being encouraged, by public dialogues and questions among other things, to question the validity of our own scientific-institutional taken-for-granted assumptions and routines.

If research has an impact on society and interacts with other research in ways that are not linear, it becomes necessary to address the legitimacy and responsibilities of research on a broader basis than merely through reference to the fact that public research grants are used and distributed by institutions and allocation mechanisms that follow strict internal quality requirements and professional norms. Helga Nowotny et al.¹⁶ points out that the dialogue with society must necessarily be an ongoing process: <112.>

That the authority of science in the future will have to be established in an ongoing process that needs to be worked out again and again in each concrete situation is the meaning of the somewhat aphoristic title of this final chapter of the book, that re-thinking science is not science re-thought.

A concept of innovation for society as a whole?

The Nordic countries have a long tradition of regarding research and technology as neutral means to achieve political goals in other policy areas (sectors). Given this kind of understanding, research and technology cannot be made visible, clear and accountable – to themselves or others – as social actors. However, this challenge is scarcely considered in Nordic research on power and democracy. The last generation of power scholars in the Nordic countries talked about “the retreat of politics” from established political institutions. Nordic studies on power have pointed out that politics and power now permeate law, media and economics; but not the research complex. Arguments that we are operating in the midst of an interaction between science and politics, research and society, far removed from the simple linear understanding of this relationship, which Kjell Eide called “the Nordic model of governance” in his article “Who is to inform politics” (*Nytt Norsk Tidsskrift* 3-4/96), seem to have had very little impact.¹⁷ <113.>

Innovation entails production of uncertainty and complexity, renewal and change, and is presented as worth striving for in research policy. But the new concepts of cooperation are also criticised for their way of suppressing conflicts, strengthening an increasing production of inequality (for example, in terms of the north–south dimension) and confirming neoliberalism. In summary; they reduce research policy to economic policy. One of the most prominent critics is Aant Elzinga in the article “The New Production of Reductionism in Models relating to Research

¹⁶ See *Re-Thinking Science* (p. 249).

¹⁷ An article mentioning some of these elements was published in the weekend magazine of the Norwegian daily paper *Dagbladet*, on 15 February 2003 in the SPOR column; Willy Pedersen “I det godes tjeneste” [Serving the good].

Policy”.¹⁸ Elzinga’s warning highlights a key challenge: how to develop a concept of innovation in and for the research system that can function for the whole of society and not only for the economy? A concept that makes it possible not only to ask what can we live off (and with), but also; what can we live *for*? <114.>

We interpret Reijo Miettinen’s discussion of the new models of cooperation as “transdiscursive” terms¹⁹ to mean that they shall be assessed in relation to other projects than “purely scientific” ones. The proposed new models can also be understood as permanently “empty” in the sense that they are invitations to interaction and cooperation between the research community and central actors in society, where neither of the parties can take ownership of the terms and fill them with their own content and rationale. In this kind of perspective, they can represent opportunities for collaboration where the parties’ legitimacy, trust and “social capital” must continuously be recreated and can thus come to play a central role in the development of socially robust knowledge. Or to quote Helga Nowotny again: <115.>

Innovation is the collective bet on a common fragile future and no side, neither science nor society, knows the secret of how to cope with its inherent uncertainties. It has to be done in some sort of alliance and with a shared sense of direction.²⁰

“Politics is good, and can even be fun”

Cooperation metaphors thus represent an argument that closer collaboration and more interaction with the outside world yield better, more “robust” knowledge. However, many researchers are provoked by this kind of claim. How far into research does the collaborative arena stretch, and what should the interaction pertain to? Relevance, quality or perhaps both? Indeed, even internally within the research system, it is not easy to establish arenas for interaction, dialogue and change, as is demonstrated by the many, endless debates on multi-, inter- and transdisciplinarity. Another central challenge linked to interaction between research and society is demonstrated by Arie Rip, a professor at the University of Twente, and his evaluation of the European ELSA projects in the report *Co-Evolution of Science, Technology and Society* from 2002. Rip bases his evaluation on a co-evolutionary perspective and is relatively harsh in his criticism of the ELSA projects. They do not lead to increased collaboration and dialogue between natural scientists / technologists and social scientists / humanists. Nor does trust between the various groups of experts seem to have grown. <116.>

In Europe, there is talk of “the new technology wave” with a focus on the so-called converging technologies, which are deemed to have direct reality-producing / transformative effects.²¹ The EU set up a High Level Expertise Group to investigate this topic with a view to developing the 7th framework programme. The group was broadly based with representatives from many disciplines. It was an interesting experiment that revealed some of the challenges entailed by cooperation and multilogues across traditional disciplinary boundaries. It also showed how

¹⁸ Paper to the Nobel Symposium, *Science and Industry in the 20th Century*, Stockholm 21-23 November 2002.

¹⁹ Reijo Miettinen, *National Innovation System; Scientific Concept or Political Rhetoric*, Helsinki 2002.

²⁰ Helga Nowotny, “A plea for transparency” in *RTDinfo*, May 2005.

²¹ Cf. the debates in USA and Europe based on USA’s national nanotechnology initiative” (NNI), plus the session in the House of Representatives, 9.4.03, where Langdon Winner points out which preferences and visions can form the basis for this transformation of reality. If, for example Bruno Latour / Isabelle Stenger’s concept of “cosmopolitics” is introduced, Winner’s area of concern is broadened.

fostering real dialogues between different academic groups may function as a central instrument in developing a dialogue with the public. It was his experiences as secretary for this group that made Alfred Nordmann claim in the final conference in Brussels in September 2004: “Politics is good, and can even be fun.” <117.>

John de la Mothe writes provocatively about the needs for change entailed by politics having to become more *process* than product in modern innovation systems and about the build-up of rules, strategies, routines and traditions that may obstruct good cooperation and interaction between “technological-innovation and policy systems, and ultimately constrain the policy-maker”. This kind of complex understanding of change is not provided by the “academic skills” on the basis of which researchers are recruited. In this context, compare with our statement in the application of the necessity of research processes being based more on processes of (continual) learning (page 9). At the same time, using feminist technoscience research as our starting point, we see how important it is to remember that there must be a balance between the various different types of knowledge in the work to co-evolve innovation systems. In particular, formative and creative knowledge must be given sufficient space and opportunity for development as a basic precondition in order to inspire (self)governance in horizontal interaction cf. our reference to Donna Haraway and her “figuration practice”. The analytical knowledge valued by a project organisation or a technical-instrumental rationality does not work in relation to the complexity and rate of change that in most areas is a basic condition for our interaction and our cooperative processes today. <118.>

One Nordic community that has been working for a while using the new concepts of interaction as its starting point is the Department of Management, Politics and Philosophy at Copenhagen Business School. By way of a conclusion, we would like to quote some phrases from the leader column in the Department’s newsletter from September 2003 where challenges to democracy entailed by the new complexity are put on the agenda for academic institutions: “Leaders who previously regarded themselves as senior officials, lawyers or administrators now have to define values and visions for public organisations. A difficult task, as it comes close to playing a political role, which public leaders have learnt they must never do if they are to remain loyal to their minister. Leaders of public institutions are thus currently breaking new ground ...”. This is true of leaders in private organisations too: “When leaders put ethics and other value questions on the agenda, organisations become overwhelmed with political questions and discussions. Not only concerning themselves as an organisation (e.g. the relationship between management and workers), but also in terms of the relationship with the outside world. Connections and networks pop up everywhere and undermine simple ideas of society. As a consequence, governance becomes incredibly political – we must head out into society and make a difference. Similarly, the arrival of the knowledge society entails greater politicisation. In the future, definition and indication of what is to be regarded as knowledge will become political arenas, as is demonstrated by the current debate about universities and their future”. The conclusion is that they, as a research institute, will get involved in the development of society – in a visible and accountable way. <119.>

Conclusion

One point of this article is to demonstrate the potentials and experiences feminist research can offer regarding mainstreaming knowledge and policy production within domains dominated by technoscience.

It is the very act of working on integration that requires and stimulates development of other theoretical perspectives and methodological ways of relating. <120.>

The ambitions of gender research to make itself scientifically relevant within specific areas²² have found expression in many different ways in the last few decades in both theory and methodology. Within fields of knowledge related to technoscience, gender research or feminist technoscience has led to the *spotlight being turned* on the basic epistemological values²³ of technoscience and to *interventions* within technology policy spheres and within the very development of technology. <121.>

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²² See Trojer et al. 2000.

²³ See publications by, for example, Donna Haraway, Sharon Traweek, Karen Barad, Ina Wagner, Nina Lykke, Susan Leigh Star, Vandana Shiva, Elisabeth Gulbrandsen, Birgitta Rydhagen, Christina Mörtberg, Pirjo Elovaara, Christina Björkman, Peter Ekdahl, Lena Trojer.

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