Introduction

Feminist technoscience\(^1\) with emphasis on ICT (information and communication technology) is certainly motivated by transformation goals. The reasons for transformation are not only seen in the ongoing difficulties of achieving appropriate ICT system solutions especially in low income countries\(^2\), but in the way we face contemporary processes of knowledge and technology development (Gibbons et al. 1994 and Novotny et al. 2001). The prerequisites for the latter are still to be met, and urge for transformation not the least within academy and technical faculties (Etzkowic et al. 1997). Feminist technoscience within technical faculties is a driving force for the transformation processes in demand (Trojer 2002).

Developing appropriate and relevant technology (system) solutions is a complex and context-dependent issue and worked up in many technology fields (Rydhagen 2002). As an illustration, in the field of wireless telecommunication we face almost a technical revolution experienced in a low income country like Tanzania by the implementation and use of mobile phones with prepay function. Such a technology for direct communication between people seems to be appreciated as appropriate, relevant and affordable by a larger group of people than the income strong elite. The technology of mobile phones with prepay function has trickled out to more income weak masses. In its turn this implies a further elaboration of situated use and socio-technical development. A 55-year-old Tanzanian woman living in the poorer surroundings of Dar es Salaam said\(^3\) she and her family could not afford a fixed line

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\(^1\) Within international feminist research closely linked to dominant areas of technology, i.e. information technology, biotechnology and material engineering, there exists a deeply rooted understanding of knowledge and technology production as processes which occur in distributed systems. In other words, knowledge creation today takes place on boundaries between universities, private sector, public sector and the political spheres. The concept ‘technoscience’ is connected to this view of knowledge and technology production. The way in which technoscience is currently defined by such leading researchers as Donna Haraway has led us at Technoscience Studies, BTH, to focus on issues related to boundaries and transgressing boundaries between science, technology, politics and society and between human beings and non-human beings as well as hybridisation processes between people and machines.


\(^3\) in an interview September 2003.
telephone. But having a second hand cellular phone for prepay recharge makes it
possible for her to develop her businesses, a necessary complement to her scarcely paid
teacher job as well as to communicate in different ways for the safety of her children,
grandchildren and extended family members. Two motivations for this technology are
brought out. The possibility to reach the very person you need to reach is higher with a
mobile phone, especially in a country where the number of mobile phone connections
are three times the fixed line connections. The woman in question also emphasized the possibility of self
control by the prepay function instead of a “salted” bill for the fixed line telephone use. The
latter is a sign of very low trust in public (and private) institutions in Tanzania – an
understandable attitude under earlier and present circumstances. The mobile phone market in
Africa has expanded more than in any other region in the world during the last seven years. In
average the market has grown with 78 % a year.\(^4\)

**Postcolonial ICT**

When ICT development issues are situated in the context of knowledge- and technology co-
development between low and high income countries, the need for understandings and praxis
of postcolonial ICT emerges and the challenges for the academy and its technical faculties
enhance. Relevance seems to be a core concept often raised. For development the change of
position from merely technology transfer to co-development is strongly in demand.

**Postcolonialism**

The situation in developing countries addresses the emerging implosion of postcolonial
situations and ICT development. The theories of postcolonial identities and situations are
research areas of great importance and volume. We want to address some threads of thoughts
in order to come closer to an understanding of the process of combining postcolonialism and
ICT. Referring to Harding (1998), we realize that postcolonialism is not monolithic; the term
has many referents and meanings. Temporally, it indicates the period beginning in the 1960s,
marking the end of formal European colonialism.

Hecht and Anderson, guest editors of *Social Science Studies* special issue on Postcolonial
Technoscience (no. 5-6, 2002) have brought together examples of how postcolonial theory is
related and deeply integrated with technoscience. They identify the theme thus: “A
postcolonial perspective suggests fresh ways to study the changing political economies of
capitalism and science, the mutual reorganization of the global and the local, the increasing
transnational traffic of people, practices, technologies, and contemporary contests over
’intellectual property’. The term ‘postcolonial’ thus refers both to new configurations of
technoscience and to the critical modes of analysis that identify them” (Anderson 2002: 643).
The development of postcolonial technoscience includes the study of how technologies travel,
how ideas about difference act on technoscientific practice, and a focus on the
commercialisation of science and intellectual property. The implosion of the two; postcolonial
and technoscience will not only show how Western technologies travel outside the West. It
will also destabilise Western technoscience at home (op.cit.).

**Postcolonial ICT and Identity**

We need to ask ourselves who is actually postcolonial, and what it actually means in relation
to the past. In her paper “Globalization meets Frankenstein? Reflections on Terrorism,
Nuclearity and Global Technopolitical Discourse”, Hecht (2003) elaborates on the ‘post-ness’

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of the ‘post Cold War’ and the ’post-colonial’. “The infrastructures and discourses of Cold War technopolitics continue to shape the parameters of global and local action, just as the infrastructures and discourses of colonialism do. We ignore those roots – and the contradictions they produce – at our peril.” (Hecht 2003: 7) In addition, Morley and Robins (1995) argue that if the ”post-ness” builds on a sense of dislocation, hybridity or displacement, these senses are new only to Europeans and white North Americans. For the colonised people in the world, the experience of fragmented realities is not new. With these perspectives, the postcolonial should be interpreted rather as a gradual change with many similarities with the past, than as the rupture that it is often argued to be. The similar could be said about ICTs, which in many ways is ”new technology travelling on old social relations”5.

The Internet is often argued to create space for the individual, especially in totalitarian states. The emancipation of the individual is however not a neutral claim, but rests on Western values of individualism. The fear of nation-states to loose control over what citizens read and hear can be regarded as a conservative, undemocratic activity (e.g. Robins and Hilliard 2002), but it also contains elements of protection of cultural traits and national virtues, especially in the fragile postcolonial states that have to mobilise around nations geographically determined by the former colonisers (Fürsich and Robins 2002). Malaysia’s Prime Minister Mahathir was quoted expressing suspicion or fear over the private ownership of the major TV channels available in Malaysia, and this reminds us of the fact that the content of the Internet is not more neutral than the governments that resist its uncontrolled spread (Wang 1997).

In a study of 29 African governmental Web sites Fürsich and Robins (2002) raise the issue of how the new ICTs are used in (post)colonial identity creation. What they found in their study was that the Web sites were directed towards foreign investors and tourists, rather than its citizens. This might reflect the small share of citizens who have access to the Internet in most African countries. The self-image of the nations and their citizens that was presented was very much in line with Western colonial image of exotic Others. The Web sites generally aim to present the countries as nations of harmony and aspirations towards modernisation and capitalist progress, with an additional flavour of traditional cultural heritage. While the sites seem to aim at emphasising the nation-state as a unity (in reaction to internal differences and in line with the colonial mapping of Africa), the different nations have set out to compete with each other for foreign investment, rather than creating a potential for a pan-African identity. In addition, many of the Web sites were produced by commercial companies in the West, and the technological logics and aesthetics ”reinforce the dependence of these texts on Western knowledge production” (p. 190).

The images that reveal themselves on the Internet and Web sites are important, as the Internet is an important arena of negotiation of the ”global identity crisis” that globalisation has brought with it (Fürsich and Robins 2002: 204).

With reference to the local and contextual understanding of the world, this story also reminds us of the nature of the Internet. It is not just a global blanket spread over us all, but a myriad of localities that are no longer entirely geographically local. Still, they are local, which is especially understood when the language is not English, but obviously, English, too, is local. The content of each web page is not of universal interest, but of interest to a specific group of people.

5 Vandana Shiva, lecture focusing biotechnology, Lulea University of Technology, 5 March 1998
Global Technopolitical Discourses

Insights into the context dependence of technological applications is increasingly recognised in theory and in policy, but it is still often overlooked in practical applications. The reason is a lack of recognition that the actual technology is not a neutral device that allows the user to choose his or her own way of using it according to the local understandings. The actual difference in local understanding and preconditions is also often underestimated. The colonial time has indeed spread European ways of doing things, but these ways have also been adjusted to the local context. In Suchman’s (2002) account, the perspective from locations outside the West magnifies the situatedness and the fluidity of technologies, although these are actual within the western context as well.

Paraphrasing Donna Haraway, Suchman (2002) argues that the design from nowhere is a result of the idea that technical systems could be constructed with a minimal cultural connection "as commodities that can be stabilized and cut loose from the sites of their production long enough to be exported en masse to the sites of their use" (p. 140). Suchman (2002) calls this phenomenon "the fallacy of the empty vessel"; "mistaking one’s own ignorance of what exists elsewhere – knowledges, information systems, practices – for their absence" (p. 140).

Although local understandings and practices will influence the appropriation of ICTs in the postcolonial in different and unpredictable ways, the position of “having never as much” (Redfield, 2002: 810) will for a long time be the position from which people in the Third World will receive ICTs. Redfield showed what reactions and tensions this position may create. Are ICTs yet another way of imposing control, of deciding what is important to know and to have, of showing who is in charge of globalisation? Are they yet another demand on transfer from national to private and commercialisation of common goods? A tool "to make the poor dream the same dreams as the rich" (Martín-Barbero 1993: 165)?

The role of universities

Experiences from development of feminist technoscience within technical faculties imply recognition of techno- and research politics deeply rooted in understandings of knowledge and technology production as processes, which occur in distributed systems. In other words, knowledge creation takes place on the boundaries between universities, private sector, public sector and the political spheres. Hence the role of the University and its (dis)ability of transformation come into sharp focus.

We can furthermore recognize ICT as one of the technological science fields most evidently provoking the borders between academic research and politics/society (Gulbrandsen 2000) and experience how the ‘negotiations’ (Aas 1999) about the character of academic research takes place in society. Experiences from Tanzania and the role of the main University of the country will elaborate on these “negotiation” processes.

Experiences Tanzania

The University of Dar es Salaam (UDSM) was born out of a decision taken on March 25th, 1970, by the East African Authority, to split the then University of East Africa into three independent universities for Kenya, Uganda and Tanzania. The University of Dar es Salaam consists of six faculties, five institutes and two colleges. It is the main University out of three in the country and the only University holding a technical faculty and in a situation where the
total number of University students in Tanzania are less than 15 000. The population in Tanzania is 34.5 million people.

Relevance and transformation
The challenge for the University as an actor of societal development is huge. High expectations are placed on the implementation of ICT, which can be recognised in strategic documents of UDSM like “As part of the ongoing transformation programme, the UDSM has initiated a number of reforms aimed at improving its main outputs (teaching, research and services to the society) through ICT. The improvement of ICT aims to suit the needs of the students and staff, the working environment and establish linkages with both industry and Government. The new ICT developments are also expected to contribute to income generation in order to complement Government and other funding sources to ensure sustainable academic programmes.”6

The vice chancellor emphasizes that within the larger transformation activities of the University the issue of relevance becomes central to the mission of teaching, research and service to the communities. As far as possible a public University in a very poor country must aim to be able to be relevant to the developmental aspiration of the people. Addressing development concerns means that the University must have impact whatever area.

The transformation should go deeper in the academic culture, the vice chancellor argues. Out of the 16 objectives in the strategic plan of UDSM, one concerns the change of the organisation culture within the University. “I must say it is not easy. If you want to bend a fish you bend it while it is still alive, before it is dry. If dry you crack it. We have come to learn that it is a bit difficult. We are still struggling with it.”7

Resource for Society and Government
The experience of approving ICT at the University started in 1993. The beginning of the 90s was the time of the Internet entrance. What happened was that UDSM brought Internet to the Tanzania telephone company (TTCL) and not the other way around. In many countries the telephone company give access to the Internet to the University. Internet powered the headquarter of the telephone company. But from the beginning they didn’t know much about Internet. Responsible people at UDSM put in a wireless line to the University main campus, a 2 MBite wireless link. The start was to give free access to Internet to the managing directors, who didn’t know much either. Now ten years later Tanzania has Internet backbone in every region. The present challenge for the University should be to lookout on how to transfer the technology to the industry and society. As a result of this tough process and the role of the University, expert people from UDSM are now managers at TTCL.

The role of the University supporting access to Internet and digital interconnections didn’t stop with TTCL. The University tried to get the Government to use the Internet. The Government could not pay the telephone bill at the time for the introduction. When TTCL started disconnecting the Government, the University decided to take the eight ministries out of the telephone network for Internet access and connect them with the wireless line of UDSM. They had to find alternative solutions.

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6 www.sida-sarec.udsm.ac.tz
7 vice chancellor, interview 2003 09 12
After a few years the prices came down for Internet access and several ISPs\(^8\) entered the scene. When the University started to raise money for the services there was no licence system. Now there is and the University compete with the other ISPs. There are still about 13 Governmental bodies connected through the University link. The impact of the initiative coming from the University was an enhancement of the motivation for the University staff to keep on with ICT development. This technology was appreciated as exiting and they were the only people who knew. The University staff engaged was eager to see Tanzania on the map, as they know how to build the systems. For the content development for the Government (eGov) the process is both ways. The Government as well as the University is looking to find the easiest way to implement the Government’s own processes and demands, which are monitoring, evaluation and easy communication. UDSM is trying to provide that kind of solutions.

\*ICT politics and borders in question*

The University of Dar es Salaam (UDSM) played a key role in the national ICT policy process. The Tanzanian ICT Task Force formed in 2001 was chaired by the vice chancellor of UDSM not only because of his official position but also because of his expert knowledge and engagement. He brought in two University people in the secretariat to formulate and write the drafts. The impact was a preferential right of interpretation of the academy although possible to moderate in the very broad and open anchoring process. This role of UDSM furthermore exemplifies a kind of implosion of the academy and the political system. At least it can be viewed as an advanced technopolitical “negotiation” between the University and the Government. We have to keep in mind that the knowledge experts on ICT in Tanzania were and are mostly located at UDSM or trained at the same place as the only institution having a technical faculty in the country.

The national ICT policy is a very well formulated document from my point of view giving a substantial understanding of the status of ICT in Tanzania as well as emphasizing 10 strategic areas for ICT and development. One of the central statements concerns the needs for Tanzania to move from being mere consumers of technology to the processes of being designers and manufacturers of ICT (3.3.1).

At UDSM the issue of how to achieve the dreams like poverty reduction, more education etc is on the agenda. Here Tanzania is seen to have a tool plus a competitive component, but how much is really Tanzanian? “We have a kind of technology where we can provide significant content of products, more than 60% as equal partners in the provision of products and services. This is mainly knowledge based. We have an opportunity to do that (provision) much more than in for example nuclear physics.”\(^9\) For rural development, running newspapers etc. even 75% is estimated to be able to be provided locally, when it comes to ICT content and services. The expansive force in the wireless telecom sector, see example in the introduction, shows how high an ICT potential can be in Tanzania.

A director at Tanzania Commission for Science and Technology (COSTECH) stressed that “it is very unfortunate that computers came to Africa as prestigious tools, as elite, sophisticated tools and not as non rocket signs. This is a myth that came with them. Computers are just

\(^8\) Internet Service Providers, also known as Internet Access Providers. It is a company that provides infrastructure for access to the Internet or for interconnecting other ISP and content based or application based services on the Internet.

\(^9\) Interview with academic staff September 2003.
ordinary technology, much easier than automobile and more powerful than automobiles, because they are all knowledge based. Knowledge based technologies transform individuals. Many have a lot of interest in them. The West pushed computers as tools for private sector. That this is not true was not understood by the Government …It all depends on how you look at things within your own country… This element of articulation is what we need to do. We have to do a lot of trying around, pilots, a lot of talking with people.”

Experiences Blekinge
Academic ICT and its applications in society and every day life force our attention towards the relation between dominating actors, of which the University is one. It stresses a relevant knowledge about its prerequisites resulting in transformation challenges within the traditional universities. One model explored for these processes has been the triple helix model stating that the three institutional bodies University, industry and Government are increasingly working together (Uhlin and Johansen 2001). The triple helix model focuses more on the outer frame for the processes. The actual knowledge and development processes are more explicitly discussed within the concept sphere of mode 2 (Novotny et al 2001).

Another experience, which we will just mention, comes from the transformation challenges that have to be taken and solved within an explicit mode 2 project. The project is situated in an integrated regional developing process based on applied ICT. The region in point is Blekinge situated in the south of Sweden. This region has undergone tremendous structural changes during the 90:s from a dependence of heavy industry and military service to ICT focus for industry and the education system with a new technical University – Blekinge Institute of Technology (BTH). The experience implies recognitions of technoscientific and research politics deeply rooted in understandings of knowledge and technology production as processes which occur in distributed systems as introduced above. These processes are no less prominent in the Blekinge region and in the research and development carried out at BTH.

In order to be able to understand and learn about distributed knowledge and technology production you have to be situated in a very concrete, day to day practice as well as achieve broad contextual knowledges. Our own experience comes from being one of the actor building a new University campus as well as an innovation node, where the University, the local political system and the private sector cooperate. The fields of competence are media technology and intelligent transport systems and logistics and we represent the University actor. Why then is feminist ICT research a driving force in these processes? To be very straightforward the answer is to be found in the identified potentials of feminist ICT research for the following, which meet some of the prerequisites for the discussed cooperation, namely the potentials to:

- expand the knowledge frames and practices for technology development in increasingly complex realities.
- open out preferential rights of interpretation in selections of standards, which always are reality producing activities.
- indicate alternative directions of ICT applications.
- contribute with competences for situating knowledge and for context dependence concerning resource allocation from high income to low income countries.
- create explicit cultures within technology related institutions at the universities (phase out "the culture of no culture") and thereby make clear that no research positions are innocent.
- develop epistemological infrastructures relevant for a society heavily dependent on research and technology.
- establish new arenas (agoras) for developing understandings of relations between research and politics.
- constitute a catalyst in the negotiations between science and society.
- create driving forces for inter- and transdisciplinary constellations.

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