



Research Division

Technoscience Studies

Department of Technology and Aesthetics
School of Planning and Media Design
Blekinge Institute of Technology (BTH)

Profile areas

Design for Digital Media

ICT for Development

Feminist Technoscience

Innovation System and Development

ANNUAL REPORT 2012

*The Mission of the Research Division of TechnoScience Studies
is to Expand and Transform Theoretical and Practical Knowledge Bases
of Technology Research & Development & Innovation*

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Executive Summary

! Highlights !

12 PhD students

3 new doctors

1 new associate professor

*Guest professor program in New Media,
linked to media technology education with more than 300 bachelor students*

e-learning project in Tanzania completed including e-LMS, content, connectivity

Sida sponsored partner in bilateral agreement with Bolivia and Rwanda

EU project GenisLab bringing BTH to forefront

External R&D funding was 68%

The research division Technoscience Studies has a transformative ambition in bringing a technical university like BTH closer to realities in needed knowledge production in high income as well as low income countries. This is done in practice and theoretically in four main profile areas namely Design for Digital Media, ICT for Development, Feminist Technoscience and Innovation System & Development.

The activities at the Research Division of Technoscience Studies (ToS) during 2012 are characterised by high number of examination and PhD students, high degree of external funding and extensive international collaboration in the field of Innovation Systems, Clusters and Development. ToS is closely linked to the undergraduate education with its profiled programmes of Digital Game, Digital Audio Production, Digital Visual Production and Web Development engaging more than 300 bachelor students.

The highly appreciated cooperation with and support from the local government of Karlshamn and the Bank of Karlshamn continued during 2012 within the context of NetPort. To participate in developing NetPort as a strong innovation system is an inspiring driving force for ToS, which thus is fulfilling one of the core values in the profile of BTH.

One senior lecturer at ToS, Birgitta Rydhagen, achieved the position of associate professor (docent) during 2012. One of the professors at ToS, Lena Trojer, has been honoured a position as adjunct professor at Nelson Mandela African Institute of Science and technology, Arusha, Tanzania.

During the year three doctorate degrees in the PhD program Technoscience Studies was earned by Fatuma Simba with her thesis titled *Determination of Viable Connectivity Technology for e- Learning in Tanzania, Case Study of Rural Secondary Schools*, Lydia Mazzi with her thesis titled *Geographical Information Technologies, Decision Support for Road Maintenance in Uganda* and Charles Otine with his thesis titled *HIV Patient Monitoring Framework through Knowledge Engineering*. All the three new doctors have been sponsored by Sida and defended their theses at their home universities - University of Dar es Salaam, Tanzania and Makerere University, Uganda, respectively.

Three PhD students are doing their research within the evolving International Graduate School for Innovation Systems, Clusters and Innovations. The Graduate School is an initiative by ToS via the Scandinavian Institute for Competitiveness and Development (SICD) and in collaboration with PACF (PanAfrica Competitiveness Forum) and Universidad Mayor de San Simon (UMSS), Cochabamba, Bolivia. Tomas Kjellqvist, who is the managing director of the International Graduate School, has during the year anchored the Graduate School in several international, academic and funding networks. A consortium is planned with the following actors in an initiating phase – the Institute of Economic Research on Innovations, Tschwane University, South Africa, the Nelson Mandela African Institute of Science and Technology, Arusha, Tanzania, UMSS, Bolivia, UNU – Merit, Maastricht, Netherlands, Aalborg University, Denmark, BTH, Research Policy Institute, Lund University, Sweden.

A specific quality of Technoscience studies is the strong and concrete link between BTH and governmental bodies, which constitutes examples of co-evolution of knowledge. One of the PhD students is a public sector doctoral student being a staff member of the local government of Karlshamn as well. Another PhD student has a high position at a ministry of industry and trade in Uganda and a third one at a council of science and technology also in Uganda.

During the year ToS had twelve active doctoral students within the PhD programme including the three, who defended their doctoral thesis during the year. One PhD student decided to take a break in her studies and left her position. The ties of ToS to international R&D collaboration were strong, with specific links to Norway, Denmark, Tanzania, Uganda, Bolivia, Rwanda, Italy and Germany.

The R&D program within the profile of Design for Digital Media was strengthened during the year with an ambitious guest professor/researcher program including leading researchers in Scandinavia. The administrative heads of BTH are acknowledging the results of the program. The programme and linked activities are presented below.

The regional relevance of the research is enhanced by involvement and collaboration in NetPort and its profile New Media. Research and undergraduate education are strongly intertwined and result in establishment of companies by students within media technology and especially so within digital game. The research project X-ovation, which ended during 2012, included innovative development processes at the municipality of Karlshamn as well as driving forces for cooperation, from which the regional development is benefitting. Pirjo Elovaara and Linus de Petris from ToS had central roles in the project. The international PhD students of ToS contribute directly to solve acute problems in their respective home countries like digital education resources for rural secondary schools, digital systems handling serious diseases and other systems for vital infrastructures in society.

BTH strategic plan 2009 – 2012, goal area number 5, concerns collaboration with developing countries. ToS was during the year strong in realising this goal not only in doctoral training and research, but also as witnessed by the following.

ToS via The Scandinavian Institute for Competitiveness and Development (SICD) have two Sida funded R&D projects. One is the project "Innovative Clusters Closing the Gap between University and Society in East Africa - a living proof of mode 2 excellence?" with Birgitta Rydham as project manager and with a budget frame of 3 190 000 SEK during 2010 – 2012. The other project is "Solar power to the poor people: Using innovative clusters to develop business models for technology transfer" with Tomas Kjellqvist as project manager and Erik von Bahr assisting and with a budget frame of 4 400 000 SEK during 2010 – 2012.

Staff at ToS was during 2012 involved in three EU projects. Professor Gerhard Bax is a GIS expert and research partner in the project "Impact of climate change and related glacier hazards and mitigation strategies in the European Alps, Swedish Lapland and the Tien Shan Mountains, Central Asia" with FORMAS as national coordinator.

Technoscience studies is one of nine partners in a 4-year EU project called GenisLab, within which a number of researchers at ToS are involved. A number of European universities in the fields of physics, nanotechnology and IT collaborate with technical partners in Italy for advanced gender equality in the academies. During the year the GenisLab project at BTH has contributed to the following results being achieved - BTH has created an equality committee with the HR Director as Chairman, GenisLab's tailored action plan (TAP) for BTH has been integrated with the work of the Equality committee, the VC has decided to introduce this TAP in the BTH score card reported to the Ministry of Education.

Art Line is an international art- and culture project in collaboration between 14 partners from 5 different countries in the South Baltic region; Sweden, Poland, Germany, Russia and Lithuania. The project is part-financed by the European Union (European Regional Development Fund), South Baltic Cross-border Cooperation Program, and will run from 2011 until June 2013. Pirjo Elovaara participated during 2012 within the sub-project Telling the Baltic (TTB). TTB is a collaborative storytelling project involving Laznia Centre for Contemporary Art (Laznia CCA), BTH, , Blekinge County Museum, Kaliningrad Branch of the National Centre for Contemporary Arts (NCCA), Nida Art Colony, Kunsthalle Rostock, Stena Ferry Line and ArtMission.

The external R&D funding for ToS during 2012 was 68 % of the total R&D budget counted on processed and granted income.

Background

The research division of Technoscience Studies belongs to the department of Technology and Aesthetics at the School of Planning and Media Design (DSN) at Blekinge Institute of Technology – a profiled University of Applied ICT and Sustainable Development.

The activities at ToS began in 1998 in the then Department of Computer Science and Economics with earmarked funds appropriated by the Parliament through the research bill 1996/97:5. A professor chair in ICT and gender research was filled the 1st July 1999. ToS is a new field of technology and engineering and is highly innovative in terms of development of gender research within technoscience, media technology, methodology for ICT related research and innovation system and cluster development.

In addition to research, undergraduate and graduate education the activities embrace work with knowledge networks, campus development, external engagements, internal work at BTH and support work for external funding of research and research collaboration.

ToS is fully integrated into the profile of BTH in terms of both applied ICT and interactions in triple helix constellations.

Staff

Administrators

Anita Carlsson / Head of Administration, Department of Administration, DSN

Madeleine Persson / Economist, Department of Administration, DSN

Marie Hallberg / Economist, Department of Administration, DSN

Ulrika Magnusson / Research education administrator, Department of Administration, DSN

Peter Ekdahl / Dean of School, DSN

Paul Carlsson / Head of Department of Technology and Aesthetics, DSN

Researchers

Carlos Acevedo / Doctoral student

Gerhard Bax / Adjunct Professor

Paul Carlsson / University lecturer

Linus de Petris / Doctoral student

Julius Ecuru / Lic., Doctoral student

Peter Ekdahl / PhD, Senior lecturer

Pirjo Elovaara / PhD, Senior lecturer

Anders Falk / Doctoral student, University lecturer

Peter Giger / PhD, Senior lecturer

Elisabeth Gulbrandsen / Lic., Doctoral student

Kerstin Gustavsson / University lecturer

Tomas Kjellqvist / Doctoral student, Project director

Lydia Mazzi / Lic., Doctoral student, PhD Nov 2012

Rebecka Molin / Lic., Doctoral student

Joshua Mutambi / Lic., Doctoral student

Charles Otine / Lic., Doctoral student, PhD Nov 2012

Linda Paxling / Doctoral student

Birgitta Rydhagen / PhD, Senior lecturer

Fatuma Simba / Lic., Doctoral student, PhD Sept 2012

Dan Sjögren / Project manager

Lena Trojer / Professor, Head of Division

Associated Researchers

Erik von Bahr / Senior advisor

Christina Björkman / PhD, senior researcher

Ellen Kallinga / PhD, senior researcher

Peter Kempinsky / Senior advisor, Kontigo AB

Peter Lating / PhD, postdoc

Suzan Lujara / PhD, senior researcher

Theoretical stance

One of the aims of Technoscience Studies is to develop complex knowledges about ICT including media technologies as reality-producing and transforming technologies as well as of the transformations that follow in its wake. The epistemological base for this is found in feminist research developed within technoscience. This presupposes participation in the appurtenant processes of transformation and knowledge production. Seeing ICT as reality-producing technologies rest on the idea that all of us, researchers in the field included, are enmeshed in development processes. No innocent positions exist. ICT intervenes in and co-creates people's everyday lives. On the other hand, ICT is developed and interpreted and practiced by people. This aim of Technoscience Studies is thus to create theoretical bases as well as practises for developmental processes in ICT-related fields as well as in the context of innovation systems.

The latter has increased in importance for ToS with a strong and upcoming research profile in innovation system and development including the International Graduate School for Innovation Systems, Clusters and Innovations together with a number of international partners.

Within international gender / feminist research with strong links to the dominant technological fields of our age – information and communication technology, biotechnology and material technology – there is a widespread understanding of the production of knowledge and technology as processes taking place in distributed systems. In these days and age knowledge is generated in the overlapping borderland of universities, industry and other regional, national and international entities as well as governmental bodies. These processes are not least apparent in our region Blekinge and affect the way in which BTH carries out R&D work. The term technoscience connotes this understanding of the concurrent production of knowledge, technology and reality. The way in which technoscience is defined by scholars like Donna Haraway raises important questions about boundaries and transgressions between science, technology, politics and society, humans and non-humans etc. as well as implosion phenomena within the same spheres.

The PhD program of ToS belongs to the faculty of technology at BTH. Along with research activities based on the individual research projects, ToS also has a joint research programme organised as division seminars and courses in order to develop epistemological competences and skills for theoretical and methodological work. Prospective doctoral students and university lecturers also participate in this research programme.

RESEARCH PROJECTS

The research projects are listed below within the four main profile areas of the research division of TechnoScience Studies. The projects can either be doctoral thesis projects or research projects. In some cases the projects belong to more than one profile area.

DESIGN FOR DIGITAL MEDIA

Theoretical Frameworks for ProduSer Oriented Design for Digital Media

Peter Ekdahl, R&D project

The aim is to develop a research structure as well as theoretical frameworks for the concept ProduSer Oriented Design for Digital Media. When starting the process of producing digital media, there are no separate roles as producer and user. The roles are intertwined in complex and dynamic relations. The understanding of these complex relations opens up for new ways of developing relevant and future oriented applications. The R&D project is closely linked to the under graduate programmes Digital Games, Digital Visual Production, Digital Audio Production, Web Development and Basics for Digital media. The project encompasses development of a deeper and more complex understanding of digital media technology and design as an area of knowledge. The aim of the project is also to define core areas and develop transformational strategies in order to find out how traditional disciplines relate to the core areas of media technology and design including serious gender perspectives.

The Rhizomatics of Social Media

Peter Giger, R&D project

The project discusses the role of Social Media in the context of Gilles Deleuze's and Felix Guattari's work. The main point is the following question: what happened when the Internet went from the ideological mindset of "Web 2.0" to the more consumer related "Social Media"? How does this change of the "media mindset" relate to the contemporary human relation to technology?

Technology as an intrinsic part of humans — from eGovernment to iGovernment

Linus de Petris, PhD project funded by Swedish Agency for Economic and Regional Growth

The research is set in a municipal government context, focusing on participation and design and use of ICT. It is carried out on a basis of action research. The public sector has for many years declared visions of technology (the Internet in particular) to enable so called 24-hour services, strengthening democracy, empowering civil society to influence policy making and political decisions, and much more.

Are these expectations on technology and the Internet in particular to solve problems in and for society realistic? Trying to fully conceptualize the role of ICT in a municipal context

and what consequences design will have for different people and processes is very complex, probably not fully graspable. The theoretical work is inspired by several disciplines, including design theories, technoscience, information architecture and cognitive science. Ideas on design as participation in assemblages of humans and non-humans are a foundation in my work. John Law's method assemblages and Pelle Ehn's notion of design things are key in the understandings of contemporary challenges for participation, design and innovation. Another important aspect for the work is the concept of hyper-reality from the thoughts of Jean Baudrillard.

The digitizing of rituals; aesthetics in digital media

Anders Falk, PhD project funded by local government of Karlshamn

The main objective is to study rituals as design hooks in digital media.

The more specific objectives concerns the issues of

- the choices of transparent virtual alternatives instead of unsure realities
- changes from gameplay mechanics towards emergent / internal meta systems.

The reality producing dynamics of the mobile artefact in East Africa

Linda Paxling – PhD project

The research objective is to provide a feminist and postcolonial technoscientific understanding of how the mobile phone is changing the reality producing dynamics in an East African context.

Following a transdisciplinary approach to ICTs and society the research will showcase the dual process of the reality producing shaping/design of mobile technologies for development (M4D) and the impacts of mobile phone usage on society.

By merging a feminist technoscience stance with an action-oriented research approach my work aims to apply a locally contextualized knowledge production of the institutionally structured situation (government initiatives, NGOs and private companies) as well as the unstructured everyday situation (everyday mobile phone use), and based on the findings suggest improvements of strategies, practices, and knowledge of the local mobile environments for policy-makers, practitioners and academics.

Keywords:

M4D, ICT4D, Feminist Technoscience, Postcolonial Technoscience, Cyborg Anthropology, Livelihoods, East Africa, Participation, Representation, Democratization

Creativity in Media Technology Graduate Education

Paul Carlsson, PhD projectThe PhD project starts in the issue of creativity and how to implement this in technical graduate education.

Educational reports published over the last 20 years have consistently identified creative thinking and problem solving as among the most crucial skills necessary for success in today's workplace, and thus have called on educational institutions to do more to promote

these abilities (Carnevale et al., 1990; Secretary's Commission on Achieving Necessary Skills, 1991; Partnership for 21st Century Skills, 2008).

Is it possible to design a learning environment in the context of media technology training that gives more focus to creativity and problem solving instead of the traditional fact learning situation?

ICT FOR DEVELOPMENT

During the year an e-learning project in Tanzania was completed. This collaborating project started in 2006 and has resulted in a complete interactive e-learning system including e-LMS, content and connectivity for secondary schools in Tanzania. The completed system is named TanSSe-L (**T**anzania **S**econdary **S**chools **e**-**L**earning).

The project refers to the following context. In response to different development challenges, Tanzania is striving to achieve her fourth attribute of the National Development Vision, i.e. to have a well-educated and learning society by the year 2025. The earmarked approach is to integrate Information and Communication Technology (ICT) in education system (e-learning), in order to improve teaching and learning processes, hence provision of quality education. However, Tanzania is challenged by lack of ICT infrastructures in rural areas, which affects integration of ICT in education.

Modelling Connectivity for e-Learning in Tanzania: Case - Study of Rural Secondary Schools

Fatuma Simba, PhD project funded by Sida.

As mentioned above the doctoral thesis was successfully defended at University of Dar es Salaam 27th of September 2012.

This thesis presents a research work to determine a cost-effective and performance efficient connectivity technology for rural secondary schools to access e-learning resources.

The research surveyed wireless technologies, in order to identify potential broadband access technologies suitable for rural areas of the developing countries. Because ICT is a very dynamic sector, the identified technologies were compared by using conceptual framework to study their sustainability and thereafter, analyzed by using technoeconomic approach to determine a feasible and cost effective option. Results show that, a third generation (3G) Universal Mobile Telecommunications System (UMTS) operating at 900MHz is a feasible and cost - effective connectivity technology for rural areas of Tanzania.

Furthermore, the research employed a simulation modelling approach to study traffic differentiation and priority scheduling mechanisms in providing Quality of Service (QoS) for e-learning applications in UMTS networks. A simulation model of the UMTS network is developed and used to study performance of e-learning applications as perceived by users. Simulation results showed that, UMTS network configured with traffic differentiation and

priority scheduling can guarantee delivery of e-learning services with the required QoS. The Public Private People's Partnership (PPPP) model is proposed by this research as an implementation strategy for sustainable broadband rural connectivity solution.

Data Mining in Health Care: HIV patient monitoring in Uganda

Charles Otine, PhD project funded by Sida.

As mentioned above the doctoral thesis was successfully defended at Makerere University 7th of November 2012.

The project refers to the following context. Uganda has registered more than a million deaths since the HIV virus was first officially reported in the country over 3 decades ago. The governments in partnership with different groups have implemented different programs to address the epidemic. The support from different donors and reduction in prices of treatment resulted in the focus on antiretroviral therapy access to those affected. Presently only a quarter of the approximately 1 million infected by HIV in Uganda are undergoing antiretroviral therapy. The number of patients pose a challenge in monitoring of therapy given the overall resource needs for health care in the country. Furthermore the numbers on antiretroviral therapy are set to increase in addition to the stringent requirements in tracking and monitoring of each individual patient during therapy.

This research aimed at developing a framework for adopting knowledge engineering in information systems for monitoring HIV/AIDS patients. An open source approach was adopted due to the resource constrained context of the study to ensure a cost effective and sustainable solution. The research was motivated by the inconclusive literature on open source dimensional models for data warehouses and data mining for monitoring antiretroviral therapy.

The first phase of the research involved a situational analysis of HIV in health care and different health care information systems in the country. An analysis of the strengths, weaknesses and opportunities of the health care system to adopt knowledge bases was done. It proposed a dimensional model for implementing a data warehouse focused on monitoring HIV patients. The second phase involved the development of a knowledge base inform of an open source data warehouse, its simulation and testing.

The study involved interdisciplinary collaboration between different stakeholders in the research domain and adopted a participatory action research methodology. This involved identification of the most appropriate technologies to foster this collaboration. Analysis was done of how stakeholders can take ownership of basic HIV health information system architecture as their expertise grow in managing the systems and make changes to reflect even better results out of system functionality.

Data mining simulations were done on the data warehouse out of which two machine learning algorithms (regression and classification) were developed and tested using data from the data warehouse. The algorithms were used to predict patient viral load from CD4 count test figures and to classify cases of treatment failure with 83% accuracy. The research

additionally presents an open source dimensional model for monitoring antiretroviral therapy and the status of information systems in health care. An architecture showing the integration of different knowledge engineering components in the study including the data warehouse, the data mining platform and user interaction is presented.

Geo Spatial Technologies as Decision Support Tools for Road Infrastructure Maintenance in Uganda

Lydia Mazzi, PhD project funded by Sida.

As mentioned above the doctoral thesis was successfully defended at Makerere University 7th of November 2012.

This study set out to develop a framework within which the use of Geographical Information Technologies (GITs) can be enhanced in Road Infrastructure Maintenance (RIM) in Uganda. Specifically it was guided by 3 objectives; 1. To assess the gaps in the use of GITs for RIM in Uganda and the limitations to accessing these technologies, 2. To develop a methodological framework to enhance the use of GITs in RIM and 3. To develop a Geographical Information Systems for Transportation (GIS-T) data model based on the road maintenance data requirements. A participatory approach through a series of interviews, focus group discussions, workshop & conferences, document reviews, field observations & measurements and GIS analysis were employed.

Based on the Spatial Data Infrastructure (SDI) concept and the principle of Causality, the gaps and limitations were established to mainly be concerned with data and organisational constraints as opposed to technical issues. They were classified to include; inadequate involvement of GITs in organisational activities, inappropriate institutional arrangements, absence of data sharing frameworks, budget constraints, insufficient geospatial capacity, digital divide in the perception, adoption & affordability of GITs among the stakeholders and the absence of a road maintenance Spatial Data Infrastructure (SDI).

A methodological framework, comprising of 6 strategic components was developed to enhance the use of GITs in RIM. This included enactment of relevant policy components to guide GIT use, continuous capacity building, establishment of a road maintenance SDI, fostering collaboration and spatial data sharing frameworks, budgetary allocation based on defined activities inclusive of GIT initiatives, and adoption of a dynamic segmentation data model.

Conceptual and logical data models were developed and proposed for the Sector. The conceptual model, presented using an entity relationship diagram, relates the road network to the point and line events occurring on it. The logical object relational model developed using the ESRI provided template represents the road and the point and line events in a total of 19 object classes.

The Study concludes that in order to ground GIT benefits in the sector; technical, data and organisational concerns involved in GIT undertakings should be accorded equal emphasis. Institutionalisation and diffusion of GITs as aspects of the component strategies are regarded capacity building mechanisms earmarked to boost success in GIT initiatives. Further research on diffusion and funding models for GIT initiatives is recommended. It is

suggested that aspects of the proposed model be considered when establishing GIT standards for the sector. The RIM sector is encouraged to embrace Science and Technology and to participate in Research and Development and particularly to adopt the culture of innovation considering the ready availability of off the shelf equipment, freeware and open source software that can foster informed decision making.

The reality producing dynamics of the mobile artefact in East Africa

Linda Paxling – PhD project, see above.

Transdisciplinary Research Development in Triple Helix Context in Uganda

Dr Peter Okidi Lating, post doc project, funded by Sida.

The aim of the postdoctoral study is to strengthen transdisciplinary research skills of the candidate and improve graduate supervisory skills as part of the staff capacity development in the Faculty of Technology, Department of Engineering Mathematics/Computer Engineering, Makerere University, Uganda, The specific objectives are the following:

- Publish a book titled “ Realities of Transdisciplinary Research Development in Uganda: Co-evolution in triple helix processes”, published at Makerere University Press, 2011
- Publish three state-of-the-art journal papers where longitudinal data analysis method is used, in process.
- Jointly supervise a PhD student under the Innovative Systems and Clusters Program (ISCP), in process.

INNOVATION SYSTEM AND DEVELOPMENT

Business Incubation Systems as an integral development strategy for industrialization of Uganda

Joshua Mutambi, PhD project funded by Sida

The main objective of the research is to establish the impact of the BI initiatives and to develop the most suitable model of small business incubation that can stimulate Industrialization in Uganda”

Specific objectives are

- to study experiences in other countries in respect to business incubation and industrial development and in the context of Government support
- to determine the factors of business incubators that affect growth and productivity of businesses in Uganda
- propose an appropriate Ugandan Business Incubator model.

Unlocking the Binding Constraints in Uganda's Innovation System

Julius Ecuru, PhD project funded by Sida

The main objective of the research project is to establish priorities for interventions within Uganda's innovation system.

Specific objectives are to

- map actors in Uganda's innovation system
- assess the patterns of interactions with respect to knowledge generation and exchange among the actors
- model the flow of knowledge and information among the actors
- identify the binding constraints and opportunities within the innovation system.

Formation of clusters focusing generation of a co-evolution context of university and industry in Cochabamba region, Bolivia

Carlos Acevedo, PhD project

Main objective is to develop knowledge about the cluster shaping process focusing the generation of a co-evolution context between the university and the cluster firms based on the experiences of Cochabamba city, Bolivia.

Specific objectives are to

- describe the clustering process taken place in the region of Cochabamba, Bolivia
- determine success factors in the clustering process for the development of a co-evolution context between the university and the cluster firms
- analyse the impact reached during the clustering process in the framework of co-evolution processes.

Aid, Knowledge and Technology Transfer

Tomas Kjellqvist, PhD project

Main objective

Recent critique of development aid by Easterly and Moyo has among other things pointed to how recipients get dependent on aid. This study will use the debate created by these authors as a context to analyse how development paradigms on technology transfer in the energy sector has contributed to shape the situation that the authors are criticizing.

Specific objectives are

- to analyse how the role of knowledge and knowledge institutions have been treated in development paradigms, with snapshots from the 1960's, 1970', 1980's, 1990's and the first decade of the 21th century
- based on this model propose an experimental model for introduction of renewable technologies to reduce poverty
- to make recommendations for the next era of technology transfers linked to the climate change mitigation and adaptation funding mechanisms.

Solar power to the poor people: Using innovative clusters to develop business models for technology transfer

Tomas Kjellqvist, project manager, Erik von Bahr, R&D project funded by Sida

This project proposes to improve the productive uses of energy in innovative clusters with solar energy installations adapted to their needs. The project will draw on previous experience of income generation through almost 75 innovative clusters in South Africa, Tanzania and Uganda. These 75 clusters are based on agglomerations of small and medium sized enterprises with a total geographical spread encompassing both urban and rural surroundings. Each cluster consist of a number of firms that are linked in a production chain or operate in the same trade, but cooperate to achieve joint competitiveness. They involve people in different productive functions throughout the value chains, and we find these people in very different socio-economic situations. Investing in solar technology for clusters would show long-term social and economic effects as the involved individuals of all social strata could increase their incomes over time.

The clusters can provide opportunities to test and improve solar energy technology in real world applications as they represent a wide range of trade areas. Working with clusters means that there are opportunities to replicate solutions and to find advantages of scale. The cluster members have acquired a basic understanding of entrepreneurship and openness to technological change. As a result they would be prepared to adopt solar technologies and adapt them to their needs. They have good experiences of participation in capacity building programs. Besides opportunities to try out solar energy technologies the clusters could develop adapted business models to apply for loans to construct experimental sites. These sites will be arenas to define research for further development of solar technology and for improving mechanisms for technology transfer.

In this case, technology transfer and capacity building requires a close collaboration between the cluster entrepreneurs as end-users, solar technology firms as providers of technology, and universities as providers of training, expertise and new knowledge. Policymakers at national and municipal levels need to be involved to at an early stage to facilitate and give political, and possibly financial, support to the activities. A constellation of these actors is commonly referred to as a “Triple Helix”. The actors are in a continuous dialogue to solve problems and transcend barriers with joint efforts. The Triple Helix requires that the respective actors join in to share their own specific knowledge and networks, and are prepared to learn things of use to their own activity area from the others. If such trust is established, the effects of the project are more likely to be sustainable. Each actor could also use his/her network for dissemination of the results, which provides for replication of approaches and solutions in a wider context.

Innovative clusters closing the gap between University and Society in East Africa. A living proof of Mode 2 excellence?

Birgitta Rydhagen, project manager, Lena Trojer, funded by Sida 2010 - 2012.

Universities in East Africa collaborate in innovative cluster initiatives in diverse locations in knowledge production in the context of application. This means that scientific researchers participate in socio-economic development and poverty reduction by developing knowledge in close collaboration with actors in local communities, with business and Government. The

umbrella organization PACF (Pan African Competitiveness Forum) provides a supportive structure and facilitates collaboration between cluster groups in different African countries.

The study focuses on two cases where cluster initiatives develop innovative solutions to address changing situations - climate change, increasing global market competition, deteriorating natural resources and an increasing need for diversified income generation among women and men. One case is the Tanzanian Zanzibar cluster for seaweed production. The other case is salt production cluster in lake Katwe, Uganda. Both clusters aim towards increasing product quality and product diversity to increase the income, and at the same time improve social conditions for workers and their families. Many of the participants are women.

The main aim is to study how innovative clusters can foster timely implementation of knowledge products with socioeconomic relevance. Focus is on the research component, since socioeconomic development is part of the strategic policies of universities in Uganda and Tanzania. The project includes focus group discussions and participatory exercises with PACF key persons and cluster members. Research results will be disseminated continuously and through a final report to research participants in the two clusters and to PACF partners. Together with one research partner from Tanzania and Uganda respectively, we will also participate in conferences arranged by Sida and UNESCO.

FEMINIST TECHNOSCIENCE

The New Production of Politics

Elisabeth Gulbrandsen, PhD project

The main objective is to explore conditions for developing responsible technoscientific cultures - in and beyond the academy. The linearity as well as the division of labour suggested by the “technology push” and “society pull” policy models are heavily criticized for ignoring the complexity and dynamics that emerge partly as a consequence of the success and pervasiveness of science and technology in late modernity.

Science and society have both become transgressive invading each other’s domains, and policy questions are enhanced into political questions. A third, more interactive policy model is emerging figured in transdiscursive terms like “strategic science”, “innovation system”, “postnormal science”, “technoscience”, “mode 2”, “agora”.

Social Networks in a Sustainable World

Peter Giger, R&D project, see above

A Sight/Site for Transparency or Opacity?
Notes on Knowledge Production and Feminist Technoscience

Rebecka Molin, PhD project

The research is devoted to looking at ways of understanding the visual, and to narrate the image as a site for meaning-making and negotiations between subjectivity, gendered relations, technology and technological artefacts.

This is done empirically by laying focus on the visual production form(at) as a way of doing and thinking about technology. My theoretical framing argues for the urgency of making images matter beyond the borders of either a clear re-presentation of reality, or the more postmodern theoretical perspectives that put emphasis on the empty image. In this, I engage with cultural thinker Jean Baudrillard and feminist technoscience theorist Donna Haraway, in order to try to understand the (im)material consequences of technology in relation to the production of the visual.

The research has been presented and summarized in the licentiate thesis *A Sight/Site for Transparency or Opacity? Notes on Knowledge Production and Feminist Technoscience*.

X-ovation : Developing e-services and e-administration

Pirjo Elovaara, Linus de Petris, Linus Peter Giger, financed by Swedish Agency for Economic and Regional Growth, 2009-2012

R&D-project in co-operation with NetPort.Karlshamn, BTH and Karlshamn municipality. The aim of the project is, taking a point of departure from the partners' competences, experiences, perspectives and interests, to make visible ongoing activities of information and communication in the society. The aims are also to develop new services and also new understandings of communication and information between public actors and citizens.

***Epistemological Issues in Computer Science Education
from Gender Research Perspectives***

Christina Björkman, research project, quiescent during 2012

This is a project with university teachers in computer science at a Swedish university. The focus of the project is gender, knowledge and learning in computer science, and the project aims to deepen the teacher's knowledge and experience in these areas in order to develop their teaching. In the longer perspective, this concerns how to make computer science more interesting to a larger group of people than is the case today. This can be accomplished by, for example, discussing issues such as what computer "is", and how it is presented, and to learn to respect and accommodate greater diversity among students and their backgrounds, interests, motives and understandings.

Theoretical Frameworks for ProduSer Oriented Design for Digital Media

Peter Ekdahl, R & D project, see above.

The reality producing dynamics of the mobile artefact in East Africa

Linda Paxling – PhD project, see above.

Innovative clusters closing the gap between University and Society in East Africa. A living proof of Mode 2 excellence?

Birgitta Rydham, project manager, Lena Trojer, see above.

Designing Climate-Smart Water Adaptation Strategies for Sustainable Urban Development. A study of Cochabamba and Kota

Birgitta Rydham, financed by Sida 2011-2013.

Project leader Dr Julie Wilk and senior researcher Dr Anna Jonsson at Tema Vatten and CSPP, Linköping University are the main researchers in the project. The project aims to try and adjust a toolbox developed for assessment of vulnerability and adaption strategies for climate change in municipal organizations. The project builds on a series of workshops with stakeholders within municipal organizations and citizens' groups. Collaboration is established with researchers in Bolivia and India to situate the toolbox and the process in the context of application. The role of Birgitta Rydham is to emphasize technoscience aspects of climate adaptation, and to develop gender relevant adjustments of the toolbox.

Feminist TechnoScience and a Shared Fragile Future - challenging the epistemological infrastructure in technology

Lena Trojer, R&D project

The research, which is mainly practice driven in developing countries, brings forward discussions on how we, as researchers in technoscience, are deeply involved in technological transformation processes through our knowledge production. The focus is turned towards the knowledge production itself and the university as partner in distributed research processes. The contemporary situation is understood as circumstances, where the boundaries between universities, industry, public sector and other kind of institutions and authorities are exceedingly hazy concerning knowledge production and evolving into complex co-evolving processes. The discussion is kept to the role and accountability of the actors at the universities. There is an emphasis on the need for (self)reflection in technological transformation processes as far as scientists are concerned.

Other ongoing projects

- Partner in the national graduate school InterGender financed by VR and coordinated by Linköping University

- Collaboration with Bauhaus University, Weimar, for developing a joint R&D program (a long term development)
- Partner in the FP7-funded project GenisLab; The Gender in Science and Technology LAB, see below
- Research collaboration with Faculties of Makerere University, Uganda, University of Dar es Salaam and Nelson Mandela African Institute of Science and Technology, Tanzania, Universidad Mayor de San Simon and Universidad Mayor de San Andres, Bolivia, see below under Internationalisation.
- R&D collaboration in PACF (Pan African Competitiveness Forum) and ISCP-Bolivia (Innovation System and Cluster Program).
- R&D in design methodology for lecturers at the media technology under graduate and graduate programs.
- The Swedish Faculty for Design Research and Research Education
- Advisory partner for the development of Muni University, Faculty of Technoscience, Arua, Uganda.

Postgraduate degrees awarded

Licentiate of Technology	Pirjo Elovaara 2001 02 02
Licentiate of Technology	Christina Björkman 2002 06 14
Licentiate of Technology	Peter Ekdahl 2002 10 25
Doctorate of Technology	Birgitta Rydhagen 2002 12 18
Licentiate of Technology	Annelie Ekelin 2003 01 27
Licentiate of Technology	Inger Gustafsson 2004 05 07
Doctorate of Technology	Pirjo Elovaara 2004 05 28
Doctorate of Technology	Christina Björkman 2005 05 23
Doctorate of Technology	Peter Ekdahl 2005 12 09
Licentiate of Technology	Peter Giger 2006 06 09
Licentiate of Technology	Peter Okidi Lating 2006 12 04
Doctorate of Technology	Inger Gustafsson 2008 01 18
Licentiate of Technology	Ellen Kalinga 2008 05 28
Licentiate of Technology	Suzan Lujara 2008 05 28
Doctorate of Technology	Peter Okidi Lating 2009 03 06
Licentiate of Technology	Fatuma Simba 2010 06 28
Doctorate of Technology	Ellen Kalinga 2010 12 08
Doctorate of Technology	Suzan Lujara 2010 12 08
Doctorate of Technology	Peter Giger 2010 12 15
Licentiate of Technology	Rebecka Molin 2011 02 11
Licentiate of Technology	Charles Otine 2011 03 31
Licentiate of Technology	Lydia Mazzi 2011 06 01
Doctorate of Technology	Maria Bäcke 2011 05 27
Licentiate of Technology	Joshua Mutambi 2011 06 10
Licentiate of Technology	Julius Ecuru 2011 09 24
Doctorate of Technology	Fatma Simba 2012 09 27
Doctorate of Technology	Lydia Mazzi 2012 11 07
Doctorate of Technology	Charles Otine 2012 11 07

Publications

Jan Björkman, Elovaara Pirjo (2012) "Synliggörande av yrkeskunnandets dolda aspekter" in Thomas Hansson, Berthel Sutter (reds) in *I närkamp med den "tredje uppgiften"*. Karlskrona: BTH, School of Management, pp 3-35.

Julius Ecuru, Lena Trojer, Yasin Ziraba, Peter Lating (2012), "Structure and dynamics of Uganda's technological innovation system", *African Journal of Science, Technology, Innovation and Development*, Volume 4, Issue 4.

Pirjo Elovaara, Sisse Finken, Christina Mörtberg (2012) "From Mutual Learning to Agential Learning", paper in the International Symposia *Diffraction Patterns Symposium: Interdisciplinary Perspectives on an Emerging Paradigm in Gender*, Session I: Onto-epistemology'. 23-25 April, Berlin, Technische Universität.

Pirjo, Elovaara, Kerstin Gustavsson (2012) "Ordering Messiness? – Diffracting an ICT-Project in Rwanda" in Wamala, Caroline (ed.) *Empowering Women through ICT*. Stockholm: Spider - The Swedish Program for ICT in Developing Regions, pp 45-54.

Tomas Kjellqvist (2012) "Materialities and entanglements in the history of development aid", paper in the Conference *Entanglements of new materialisms*, Linköping University, May 25-26.

Tomas Kjellqvist (2012) "Symbolic and Real Capital in the Energy Sector", paper presented at The Royal Swedish Academy of Sciences, Workshop *Building a future energy system in Africa*, September 10-11.

Tomas Kjellqvist (2012) "Inclusive Innovation: Turning emerging innovation systems to cater for the poor", paper presented at International Science Programs, Workshop *Research cooperation with Mozambique*, Uppsala University, October 22 – 24.

Lydia Mazzi (2012) *Geographical Information Technologies, Decision Support for Road Maintenance in Uganda*, BTH, Doctoral Dissertation Series No. 2012:11.

Joshua Mutambi (2012) "Adoption of Open Innovation approach for sustainable Business Incubation Process", paper in the proceedings of the 10th Globelics International Conference, Hangzhou, China.

Charles Otine (2012) *HIV Patient Monitoring Framework through Knowledge Engineering*, BTH Doctoral Dissertation Series No. 2012:12.

Linus de Petris, Pirjo Elovaara (2012) "Planning as Performativity in Urban Design - Experiences from a Swedish Case" in proceedings EASST 2012: Design and displacement – social studies of science and technology, Copenhagen, Denmark.

Linus de Petris (2012) "Mina meddelanden - plan för Karlshamns kommun" (My messages – plan for Karlshamn Municipality) in proceedings Conference *KommITS och Sambruks* höstkonferens (Municipality ICT and Joint Use Autumn Conference), Halmstad.

Birgitta Rydhagen (2012) "Innovation as development and liquidation. Feminist materiality and postcolonial development arenas", paper in the conference *Feminist Materialisms* Copenhagen University, April, 26-27.

Fatuma Simba, Lena Trojer, Yonah Zaipuna, (2012) "Sustainable Broadband Connectivity Model for Rural Areas of Tanzania", *African Journal of Science, technology, Innovation and Development*, vol. 4, nr 2.

Fatuma Simba, Lena Trojer, Nerey Mvungi, Bakari Mwinyiwiwa, Emmanuel Mjema (2012) "Techno-Economic Analysis of UMTS900 and UMTS2100 for Rural Connectivity in Tanzania" in proceedings 14th IEEE International Conference on Communication Technology, ICCT, pp 10 - 15, Publisher IEEE, Chengdu, China.

Fatuma Simba (2012) *Determination of Viable Connectivity Technology for e- Learning in Tanzania, Case Study of Rural Secondary Schools*, BTH Doctoral Dissertation Series No. 2012:09.

Lena Trojer (2012) "Innovativa högskolemiljöer och genusforskning" (Innovative university environments and gender research), *Genusperspektiv*, Nr 2.

Lena Trojer (2012) " Något om forskarhandledning - genusperspektiv och tvärvetenskap" (Comments on research supervision – gender perspectives and interdisciplinarity) in Martin Stigmar, Thomas Sandstedt (eds) *Kvalitet och kollegialitet – vänbok till Leif Lindberg* (Quality and collegiality – friend bok to Leif Lindberg), School of Education, Psychology and Sport Science, Linnaeus University, Linnéuniversitetet, Publication Series Nr 7.

Media Coverage about the Division of Technoscience Studies and its Members

* Pirjo Elovaara's and Kerstin Gustavsson's work is presented in Spider ICT4D Series No. 4, 2012, Empowering women through ICT, Caroline Wamala, with a chapter on Women's digital baskets – Rwanda.

* Forskning.se

2012-11-06 Press release from BTH

Road maintenance in Uganda involves constant challenges. The road network has been developed in a chaotic manner, with poor road surfaces, potholes, poor road design and inadequate drainage.

* Blekinge Läns Tidning (local press for the county Blekinge)

2012 07 09 article about PhD student Charles Otine and his work and life while at BTH, campus Karlshamn.

* Our students to final in European competition, as below and

<http://bastion.gamespress.com/link.asp?i=2318&r=58400&r2=37019>

6 December 2012

* THE BIG FOUR – FINALISTS ANNOUNCED FOR EPIC GAMES' MAKE SOMETHING UNREAL LIVE 2013

Judges select four best presentations to contest the grand finale at Gadget Show Live CARY, N.C. (December 6, 2012) – Epic Games, Inc., creators of award-winning games and game technology, has announced the four finalist teams who will compete in the grand finale of Make Something Unreal Live (MSUL) 2013, the European student game development competition.

The 12 teams shortlisted in the competition presented their work in progress live to a panel of judges at the Wellcome Trust. This year's MSUL theme is 'Mendelian Inheritance: genetics and genomics,' which is supported by the Wellcome Trust, and each of the 12 shortlisted games has been developed according to a creative interpretation of this topic.

The teams were ranked on a range of criteria including scientific implementation, concept originality and presentation quality. The judging panel comprised Jo Twist, CEO of UKIE, Stephen Gaffney, CEO of Fireteam, Tim Edwards, editor of PCGamesN, and senior personnel from Epic Games and the Wellcome Trust.

The four successful teams are:

<i>Team</i>	<i>University</i>	<i>Game title</i>
Dead Shark Triplepunch	Blekinge Institute of Technology, Sweden	Loch Ness
Kairos Games	Staffordshire University	Polymorph
Static Games	Bournemouth University	Mendel's Farm
Team Summit	University of Abertay Dundee	Beings

The finalist teams have four months between now and the start of Gadget Show Live, which opens on April 2, 2013, to work on their games using Epic's Unreal Development Kit (UDK), the free edition of Unreal Engine 3 (UE3)

About Epic Games: Established in 1991, Epic Games, Inc. develops cutting-edge games and cross-platform game engine technology. The company is responsible for the bestselling "Unreal" series of games, the blockbuster "Gears of War" franchise and the groundbreaking "Infinity Blade" line of mobile games. Epic's award-winning Unreal Engine technology has won dozens of awards and is available for licensing. Epic is continually recruiting top talent for its studios located in North Carolina, Washington, Utah, Maryland, Poland, Korea and Japan. Additional information about Epic can be obtained at www.epicgames.com. (The BTH Dead Shark Triplepunch, our students, won and received the first prize in April 2013)

Postgraduate activities

Visiting Scholars Program

During the autumn 2012, a special effort has been made in the area of media technology / design for digital media for recruitment purposes in strengthening research in the area. This program has the following implementation

Visiting scholar

*Elin Hallgren - <http://caspo.se/archives/tag/elin-hallgren>

CASPO / social media, web, Gender & ICT, communication, October 2012

Guest Professors

- * Associate Professor Staffan Björk - www.ait.gu.se/kontaktaoss/personal/staffan-bjork game research, game design, University of Gothenburg, week 44, 2012.
- * Acting Professor Kristine Jørgensen - <http://uib.academia.edu/kristinejorgensen> movie sound, new media, game studies, games research methods, digital games, game sounds, video game audio and music, etc., week 50, 2012

Guest Research Networking

- * Meeting with Professor Jonas Linderöth - <http://spelvetsenskap.blogspot.se/> Game Studies, University of Gothenburg, 2012 08 21
- * Meeting with Professor Kåre Synnes and colleagues www.ltu.se/staff/u/unicorn-1.10291 Media Technology, Luleå University of Technology, 2012 10 19.

PhD courses

Elaboration on design theories for digital media

The course was attended by PhD students, other research staff as well as by our lecturers in media technology. The course thus worked as a development platform for our new media development.

Writing Imaginaries, Making Futures

This course was conducted in the form of thematic workshop with PhD students from partner universities within InterGender, see below.

InterGender

ToS partner in the VR funded National Graduate School

InterGender links Swedish PhD programs in Gender Studies and set up relations to four major European Research Schools within the area. Participants are Gender Studies units at the universities in Blekinge, Göteborg, Linköping, Luleå, Lund and Örebro that have established Gender Studies as a research training area of its own, as well as Gender Studies units at the universities of Stockholm, Uppsala and Umeå. International partners are the Finnish, the Dutch and the Inter-Nordic gender research schools as well as the transdisciplinary gender research school at Humboldt University, Berlin. InterGender is linking these strong, but scattered research training units in a joint, systematized program of PhD courses, PhD supervisors' courses, thematic research seminars and conferences. A clustering of PhD students in long-term trans-institutional and ICT-facilitated discussion groups is an aim. It is expected that InterGender will generate synergies and a significantly enhanced level of quality due to critical mass and complementary expertise of the research staff. Pirjo Elovaara, Lena Trojer and Linda Paxling are working with InterGender. During the year a thematic workshop with ass.professor Laura Watts at IT University of Copenhagen was conducted as the resource person under the theme of *Writing Imaginaries, Making Futures*. The workshop took place March 27 – 29, 2012 at BTH, campus Karlshamn.

Development of the R&D profile Design for Digital Media

Position

The development work of the Media Technology Group in the undergraduate programs indicates that the core knowledge foundation of design for digital media is evolved in the expression of the production (in Swedish *gestaltande produktionen*). Consequently there are specific demands on the epistemological and methodological bases as well as the formation of the R&D profile to support the activities.

The objectives of the R&D profile of Design for Digital Media are:

- to strengthen and more clearly articulate the design environment for undergraduate courses
- to develop Master programs and courses on graduate level
- to develop the research profile of Design for Digital Media. It is still an open question to keep the profile within the PhD program of Technoscience Studies or to bring the profile into a specific PhD program of its own
- to provide relevant qualifications for the teacher staff of Media Technology at graduate level
- to strengthen cooperation with external education and research actors nationally and internationally
- to develop co-production with the industry and the public sector.

The R&D profile of Design for Digital Media includes the following:

- Seminars developing the conceptual repertoire. The activities are open to the teacher as well as researcher staff. This enables us to identify and prioritise the needs of qualification for our teachers. The activities include seminars with guest speakers, literature and writing workshops, participation in conferences with papers.
- Courses at graduate level to qualify the teachers and invite applicants from other university sections and colleges in order to broaden our networks.
- Graduate school at the national level in collaboration with other universities. This facilitates teachers' qualifications and networking.
- Research groups focusing three areas: theory, development of design education and applied research.

The Swedish Faculty for Design Research and Research Education

Design for Digital Media at ToS is a member of the Swedish Faculty for Design Research and Research Education. The aim of the Swedish Faculty for Design Research and Research Education (previously the Center for Research in Design) is to create a solid, critical and future-oriented platform for research, advanced practice and education in the field of design.

The Swedish Faculty for Design Research and Research Education was founded in December 2007 financed by Swedish Council of Research (VR) and Royal Institute of technology (KTH) and is a national center for design research based at KTH Royal Institute of Technology. The faculty encourages the development of design as a field of knowledge so that it can respond to social, economic and technological challenges in society in a

sustainable, innovative and aesthetically aware manner. Currently the faculty is hosting 47 doctoral students from 12 of its 20 member institutions throughout Sweden.

Design concerns us all, everyday and everywhere, in private and in public. In this sense, design is society's biggest cultural sector. Thanks to its ability to effect renewal, design also has a decisive impact on competitiveness in many industries. Design research is needed so that design can develop its cultural and innovative role to meet the future's complex and rapidly changing world with its increased demands for sustainable development.

Research Development

The R&D program within the profile of Design for Digital Media was strengthened during the year with an ambitious guest professor/researcher program including leading researchers in Scandinavia, see Postgraduate activities above. The administrative heads of BTH are acknowledging the results of the program and support an implementation of recruitment of more permanent professors for the profile.

The International Graduate School on Innovation Systems, Clusters and Development

Background

As an impact of the development of the Innovation systems and Clusters program in East Africa (ISCP-EA) since 2004 and in Bolivia Cochabamba since 2007 one research component identified in the programme is PhD training. This component contributes with a research based understanding and practice of the development of innovative clusters and innovation systems. A number of active cluster facilitators have expressed a strong wish to do research as a PhD candidate within the frame of the ISCD or are already PhD students and wish to be linked to a graduate school of the ISCD.

The objective of the International Graduate School is

- to develop research based understanding and practice of innovative clusters, inclusive innovation and emerging innovation systems and thus contribute to social/economic sustainability.
- to give PhD students international experiences and benchmarking possibilities within the core knowledge field of the graduate school as well as networking possibilities of value for future carrier.

Each PhD student is registered in his/her home university and follows the regulations of the home university. The doctoral student is free to participate in any of the activities offered by the graduate school. The participating doctoral student will receive a certificate from the graduate school when achieving doctoral degree.

The activities suggested include a curriculum catalogue, consortium of universities and key institutions, summer school focusing cluster development, innovation system and innovation and development studies, list of PhD themes linked to relevant problem identification and advanced supervisor collegium development.

Presently Joshua Mutambi, Julius Ecuru and Carlos Acevedo are doing their research within the International Graduate School. Other PhD students are affiliated. An international group of supervisors is available. Meetings were conducted with the Vice Chancellor of the Nelson Mandela African Institute of Science, Technology and Innovation in Arusha, Tanzania, concerning an African university hub for the International Graduate School. The Director of the International Graduate School, Tomas Kjellqvist, is heading the development of a *university consortium* with the following partners (in the initiating phase) - Institute of Economic Research on Innovations, Tschwane University, South Africa, the Nelson Mandela African Institute of Science and Technology, Arusha, Tanzania, UMSS, Bolivia, UNU – Merit, Maastricht, Netherlands, Aalborg University, Denmark, BTH, Research Policy Institute, Lund University, Sweden.

Internationalisation

Technoscience Studies was involved in the following international R&D&I activities:

Partners in Developing Countries

Cooperation with **the College of Engineering and Technology (CoET) at the University of Dar es Salaam, Tanzania**, on an e-learning project. The form of cooperation is via doctoral studies within the Sida funded program ICT - Design and Implementation of a Web-based Interactive E-learning Framework. Two doctoral students, Ellen Kalinga and Suzan Lujara defended successfully their doctoral theses in December 2010. Fatuma Simba finalized her Ph.D. studies successfully at both CoET and BTH, with three Tanzanian research supervisor and two Swedish research supervisor. Ellen Kalinga, Suzan Lujara and Fatuma Simba have conducted their PhD studies both at their home university UDSM and at BTH.

Cooperation with the **College of Engineering, Design, Art and Technology (CEDAT) at Makerere University, Uganda**, on e-learning, datamining, GIS and innovation system projects. The form of cooperation is via doctoral studies and one postdoc. Four doctoral students, Charles Otine, Lydia Mazzi, Joshua Mutambi and Julius Ecuru, conducted their Ph.D. studies at Makerere University and BTH with Ugandan research supervisors and Swedish research supervisors. Charles Otine, Lydia Mazzi defended successfully their doctoral thesis at Makerere university November 2012. Peter Okidi Lating from Makerere University is doing his postdoc in collaboration with BTH, ToS.

ToS is a collaborating partner to the new **Muni University, Uganda**, in the development of the Faculty of Technoscience both concerning under graduate curriculum, research and ICT infrastructure development.

Cooperation with the **Universidad Mayor de San Simón (UMSS) in Bolivia** on development of innovation systems. The form of cooperation is via doctoral studies. One doctoral students, Carlos Acevedo at UTT (Technical Transfer Unit at UMSS) is doing his Ph.D. studies at BTH with two Bolivia research supervisors and two Swedish research supervisors.

The Scandinavian Institute for Competitiveness and Development, **SICD**, placed at ToS and supported by Sida and VINNOVA continued its activities in East Africa and Bolivia, see the website www.sicd.se. The mission of SICD is to support social and economical development by facilitating cluster development and innovation. SICD include collaborations between Swedish and African partners since 2003 and Bolivian partners since 2007 in programs on Innovation Systems and Innovative Clusters. The African program is coordinated by Pan African Competitiveness Forum, **PACF**. PACF conducted during 2012 an annual conference in Nigeria, at which SICD was represented. The Sida funded Innovation System and Clusters Program in Mozambique continued. SICD collaborates with **FNI** (National Research Fund Mozambique) and conducted facilitator training in a team including experts from SICD and PACF-Tanzania and PACF-Uganda. In Bolivia the SICD team was facilitating training of cluster development in Cochabamba in collaboration with **UTT at UMSS** and with **DIPGIS at UMSA** (Universidad Mayor de San Andrés) in La Paz.

The development of **the International Graduate School on Innovation Systems, Clusters and Development** continued during the year, see above.

Central Institute for Applied Geosciences (CAIAG, Bishkek, Kyrgyz Republic) is the main partner in the Tien Shan region for our climate change related project EurasClimpact (see below). Gerhard Bax is responsible for dissemination of research results and training of local partners in mitigation of global change related geohazards. For a work shop and training sessions an Open Source E-learning platform (LMS) has been established locally in Bishkek.

Partners in High Income Countries

Humbolt University, Berlin

ToS collaborates with Humbolt University via the national graduate school InterGender.

Bauhaus University, Weimar

The collaboration with Bauhaus University and its Media Faculty is long term relation and development and is highly valued by ToS. During the year efforts was made to secure funding to a guest professor visit by colleague from Bauhaus university with little success. Similar efforts will continue coming year.

The GenisLab

The project aims to implement structural changes in a group of selected scientific organisations in order to overcome the factors that limit the participation of women in research. The nine partners are: CSIC (Spanish Superior Council for Scientific Research) Institute for Polymer Science and Technology, Spain; IPF - Leibniz Institute of Polymer Research Dresden, Germany; FTM UB _ Faculty of Technology and Metallurgy, University of Belgrade, Serbia; NIC _National Institute of Chemistry, Slovenia; INFN, National Institute for Nuclear Physics, Italy; BTH _Blekinge Institute of Technology, Sweden. Technical partners are: FGB- Fondazione Giacomo Brodolini, Italy; ITC/ILO _ International Training Centre of the International Labour Organization, Un Agency, International; ADS - Italian women in science organization, Italy.

During the year the BTH team of GenisLab finished its tailor made action plan (TAP). This TAP was discussed with and accepted by BTH equality committee as part of its activity plan. The deputy vice chancellor of BTH in charge of BTH score card decided to integrate the TAP as a specific perspective in the score card, which is reported to the Swedish Government. For more information see www.bth.se/genislab

Department for Environmental Geosciences, University of Vienna,

is contractor in the international project *Impact of climate change and related glacier hazards and mitigation strategies in the European Alps, Swedish Lapland and the Tien Shan Mountains, Central Asia*. Other cooperation partners are: Austrian Central Institute of Meteorology and Geophysics (ZAMG) and GeoForschungsZentrum Potsdam, Germany), more information is available on the official project-website <http://www.bth.se/dsn/eurasclimpact.nsf>

Cooperation between BTH, business and the community/politics

The cooperation profile of BTH is an explicit praxis in the activities of the Division of Technoscience Studies. Indeed, this praxis in itself constitutes empirical results for the production of knowledge, broadens the understanding of technology and innovation and creates relevance for the activities of ToS.

BTH campus Karlshamn

Most staff at the Division of Technoscience Studies is involved in BTH's construction of a university campus in Karlshamn. This effort began in 2000 and has intensified as operations grow. The collaboration at NetPort pertains to all kinds of undergraduate education and student issues, cooperation with upper secondary schools and other education providers, various EU project constellations, support for research also in cooperation with experience-based learning, local government and business contacts, incubation activities with participation in the savings bank's foundation of Karlshamn Bank (Sparbankens Näringslivsstiftelse) to promote economic development, etc. The long term support from the local Government of Karlshamn is highly appreciated and constitutes a base for a very fruitful development of NetPort and BTH campus Karlshamn.

NetPort and BTH are situated in the same premises. There are many activities going on at NetPort, which means visibility for BTH's presence in Karlshamn and a form of indirect marketing. The contacts with NetPort's director and staff during the year were vital for a fruitful collaboration especially in the profile area of Digital Media at BTH campus Karlshamn.

Commissions

Below is a presentation of commissions the staff members at the Division of Technoscience Studies had during the year, both at BTH and elsewhere. A conclusion to be drawn from the list of commissions as well as what is presented above, is that the collected expertise found at ToS is relevant in numerous important contexts.

Peter Ekdahl

- Co-supervisor for the PhD students Rebecka Molin and Anders Falk
- Acting dean of School of Planning and Media Design, 2009 – 2011
- Dean of School of Planning and Media Design 2011 -

Pirjo Elovaara

- Supervisor for Linus de Petris in his PhD project “Technology as an intrinsic part of humans - from eGovernment to iGovernment”
- Member of the Gender Expert Group at National Research Council 2010-
- Board member of the National Graduate School InterGender, 2008 –
- Member of the GADNET – network
- Reviewer for Information, Communication and Society Journal, Graduate Journal of Social Science and Women, Work and Organization
- Committee member for IADIS ICT, Society and Human Beings conference

Peter Giger

- Member of the planning committee for the culture house, Östra Piren, Karlshamn
- Member of the research network “Digital Art and Culture in the Age of Pervasive Computing”
- Editor and technical developer of International Journal of Feminist Technoscience
- Supervisor for Anders Falk in his PhD project “The digitizing of rituals; aesthetics in digital media”
- Supervisor for Linda Paxling in her PhD project “The reality producing dynamics of the mobile artefact in East Africa”

Tomas Kjellqvist

- Vice-Chair of the Swedish National Commission for UNESCO
- Member of the scientific expert group for UNESCO, coordinated by the Swedish Research Council
- Member of the Advisory Board to CAAST-Net

Birgitta Rydhagen

- Contact person at BTH in the national research network Gender and Development studies (GADNET)
- Supervisor to PhD students Ellen Kalinga, Suzan Lujara and Carlos Acevedo.
- Reviewer for International Conference on Engineering and Meta-Engineering (ICEME)
- Reviewer for the European Journal of Engineering Education (EJEE)
- Reviewer for Tidskrift för Genusvetenskap, www.tegeve.se

Lena Trojer

- Adjunct professor at Nelson Mandela African Institute of Science and Technology, Arusha, Tanzania, 2012 -

- Board member of the National Graduate School InterGender, 2008 -
- Member of the National Steering Committee of PACF-Tanzania 2006 -
- Member of PACF Council 2010 –
- Member of the Advisory Board for the Swedish Secretariat for Gender Research 2010 – 2012
- Director of Scandinavian Institute for Competitiveness and Development (SICD), DSN, BTH, 2008 -
- Board member of the Savings Bank's Foundation of Karlshamn Bank, 2002 –
- Board member of NetPort.Karlshamn, 2004 –
- Member of the Grading Committee for the Zeinab Tageldeen's doctoral thesis, School of Architecture and the Built Environment, KTH
- Reviewer of application for a position as professor at Lulea University of Technology.

www.bth.se/tks/teknovet.nsf/

