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UPGEM

**Understanding Puzzles in the Gendered European Map  
Brain Drain in Physics through the Cultural Looking Glass**

Specific Targeted Research or Innovation Project

**Final Publishable Summary + PUDK**

Period covered: from 01/09/2005 to 30/09/2008

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Project coordinator name:  
Mrs. Cathrine Hasse

Project coordinator organisation name:  
Aarhus University,  
The Danish School of Education (Danmarks Pædagogiske Universitetskole)  
Tuborgvej 164  
Copenhagen, Denmark

## **Final Project Activity Report: Publishable summary**

### **UPGEM: Understanding Puzzles in the Gendered European Map**

#### **- Brain Drain in Physics through the Cultural Looking Glass**

Over the next decades the general decrease in populations will affect all sectors of higher education and research in Europe. Natural sciences are already facing increasing problems with recruitment, especially of female students to physics. Therefore, it is a matter of utmost concern that well-qualified female scientists often leave the research system prematurely and those who stay rarely or never top-level positions or achieve distinguished careers in research and development in the same way as their male counterparts do. These facts have been well documented in a number of studies, notably the SHE-figures, the Helsinki Group Reports and the ETAN - and ENWISE Reports. The primary objective of the UPGEM project has been to identify relevant local cultural-historical processes behind the frustration of female physicists which leads them to leave or plan to leave the field of physics at universities in Europe even though they have the same formal qualifications as their male colleagues.

Even though the overall picture is a dismal one, an interesting configuration of cultural diversity emerges when we observe the gendered European map closely. For one, it seems comparatively easier to attract female students to the field of physics in eastern and southern European countries than in the North. Secondly, career paths also seem to follow different patterns connected to cultural and historical changes. In observing the gendered European map we identify the informal aspect that shape career paths in academic workplaces in various cultural contexts. We also demonstrate how scientific endeavours are interwoven with social and cultural changes as well as changes in the understanding of the discipline of physics.

UPGEM has provided new insights to this field through close-up (qualitative) studies of the work environment of female and male academic staff at physics institutes at more than 20 universities covering the North/South and East/West axes of the European map. The research results are accessible online at [www.upgem.dk](http://www.upgem.dk) and published in a number of publications.

The first project results are presented in *Draw the Line! Universities as workplaces for male and female researchers in Europe* – online also accessible as *Full Collection of National Reports* – which contains national studies from Finland, Poland, Estonia, Italy and Denmark of shared themes such as competition, identity, career path and work environment.

The lack of female scientists has often been discussed with a reference to the metaphor of ‘the glass-ceiling’. In our publication *Draw the Line! International Conference, Copenhagen May 2008*.

*Papers, proceedings and recommendations* we describe a variation in how high or low we have found the glass ceiling to be hanging nationally. This publication also presents speeches from most of the conference speakers as well as the UPGEM partners' recommendations addressed to the European Commission. The UPGEM partners recommend more effective policies countering the lack of careers of female physicists; the first step in this process is to break the cultural patterns of connections that obstruct female scientists' career tracks.

In our third publication, *Break the Pattern! A critical enquiry into three scientific workplace cultures: Hercules, Caretakers and Worker Bees*, we put forward an explanation why it is comparatively easier to attract female students and keep female scientists on the career track in eastern and southern European countries than in the North, and that career paths seem to follow different patterns connected to cultural and historical changes. We discuss the processes of exclusion of female physicists in relation to 'physics as culture' and physics in culture'. This publication also takes up the metaphor of the glass ceiling by suggesting that in practice the ceiling is generated by clusters of cultural models forming different sets of ideas about how women and physics might be connected. By identifying clusters of interrelated cultural models, we have identified three ideal type scientific cultures, in 'physics as culture', that seem to support or oppose the connection between women and physics. We name the three culture types the Hercules culture, the Caretaker culture and the Worker Bee culture. All three culture types are found in each of the national settings in the project, but some can be argued to be more predominant in certain national cultures compared to others. The ideals of the scientific cultures shape the female physicists' career paths differently. We also discuss how the national construction of 'class'- versus 'gender'-societies can contribute to different possible career paths. The puzzle of gendered career paths is thereby connected to cultural patterns found in the discipline of physics as well as in national cultural historical processes.

## Final plan for using and disseminating knowledge:

In 2008 project results were presented at:

- a) The EPWS Annual Conference 2008 Vilnius 5-7 June 2008 (CH)
- b) The Belgrade Women's Studies and Gender Research Center, 17-18 June 2008 (CH)
- c) The physicists conference *CHarged 2008*, Uppsala, September 16<sup>th</sup> speaker (CH)
- d) As two key-note speech delivered at the joint gender and physicists conference NORWIP-GENDADA, Uppsala 17.-18. September. (CH, KR and EL)
- e) A key-note speech '*UPGEM results*' at the physicists *EPS2008* conference, Crete, Heraklion, 12.06.2008 (CH)
- f) The joint *4S/EASST* Conferences in Rotterdam 20.-23. August 2008 at two workshops: one with Sharon Traweek (as discussant), the other with Don Ihde (as speaker and organiser) (CH)
- g) San Diego *Second ISCAR Conference* 8-13 September 2008, two workshops, speakers (CH, AMJ)<sup>1</sup>

We furthermore had the possibilities to get input and response to our work at a seminar with the American researcher Sharon Traweek at a seminar at DPU September 3<sup>rd</sup>. Sharon Traweek is an associate professor in the History Department at UCLA; she has also been on the Program in Science, Technology, & Society at MIT. Her first book was one of the first studies touching on gender and physics *Beamtimes and Lifetimes: The World of High Energy Physicists* (Harvard University Press, 1988, paperback 1992).

After project has ended more dissemination has been planned including a special issue of Science Studies on UPGEM results (deadline December 2008), and so far three conference presentations involving all partners in the project:

- a) A workshop entirely presenting UPGEM results: *Gender, Workplace Culture, and Physics in Four European Countries*, at the 6<sup>th</sup> European Conference on Gender Equality in Higher Education Stockholm University, 5-8 August 2009

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<sup>1</sup> CH= Cathrine Hasse, AMJ= Anna Maria Ajello, KR=Kristina, EL=Endla Löhkivi,

- b) *Gender and Physics* Panel at the 7th European Feminist Research Conference “Gendered Cultures at the Crossroads of Imagination, Knowledge and Politics” 4-7 June 2009, Utrecht University
- c) A workshop entirely presenting UPGEM results: *Getting into physics: the influence of parents versus all significant adults in building woman physics identity*, at the EARLI congress in Amsterdam at August 2009.

The UPGEM-project has finally been granted a special issue of *SCIENCE STUDIES* to present project results – to be published in the first issue of 2010 (final deadline for contributions from the partners March 2009).

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Furthermore an UPGEM network of researchers studying women in science including UPGEM project partners from Estonia, Finland, Italy and Denmark and a number of other researchers from US, Sweden, Norway and Serbia has been initiated (and accepted as full conditional member) under EPWS-European Platform of Women Scientists.

The objectives of the project period concerning this project activity report have been met.

**Summative comments:** The overall objectives of the project activities have been met.

The project results have been disseminated as planned. We have encountered difficulties, but they have been overcome along the way (see Evaluation Report – Deliverable 7). The research has not solely led to the expected project deliverable within the project period, but has initiated further dissemination and a new network.