Computer Science

Course: Computer Science
Group of courses: Engineering
Provided by: Prof. Dr. Heidelinde Schelhowe
Last edit:

Table of contents

Course objectives:

Addressing gender issues in computer science degrees should make future computer scientists more sensitive to the role that gender plays in the research and development of computer systems. It should also make students aware that access to software and hardware at and outside of work is very varied between different (male and female) users. This also involves epistemological insights into the link between social context and software and the influence of gender issues on the historical development of computer science. Addressing such issues in degree courses aims to enable computer scientists to design their own working conditions in such a way that they are attractive for women and men. The main objective is to make future designers aware that software systems must be open for the needs of both men and women and that they should allow greater diversity in access and use.

Teaching content/subject-specific gender studies content:

I suggest the following five focal points:

1.

   Women and men in computer science

   - Men and women are not equally represented in computer studies degrees. This applies to Germany, but also to a number of other highly developed, traditional industrial nations. Comparative studies show that this is by no means the case in many Asian and South European countries, for example. Students should be taught about studies that investigate these differences and should attempt to explain them. These studies can provide information on the dominant technical culture, which frequently hinders diversity and can thus also have a restrictive effect on development processes for hardware and software. They can also contribute to a reflection of teaching and studying processes at the university level.
   Students should learn about gender mainstreaming as a concept and instrument of higher education and research development in relation to computer science.

2.

   Access to computer technology for women and girls, men and boys

   - One key cause for the low percentage of women in computer science can be seen in the socialisation of children and young people inside and outside of school. Youth culture often identifies social and technical matters as opposites and ascribes them to different genders. Such self-images prevent girls from developing a fascination for technology, and boys and girls from relating technology to contexts and social networks. Much of this takes place in young people's free time, but school also plays a role in the development. A basic knowledge of studies describing this socialisation experience with digital media, and also of projects that show it is possible to take action against these gender-specific ascriptions, should form part of every degree. Difference theories and deconstructivist approaches should be explained in this context.

3.

   The information and knowledge society and changes in gender relations

   - The computer is the technical core of many developments, which are summarised under the term "information society" or "knowledge society". These developments have brought forth fundamental changes in working processes, which have caused huge

changes in industrial societies. They also open up to question the gender divisions in labour characterising industrial society. Various sociological studies and studies on "socially compatible technology design" have investigated the role of information and communication technologies in these processes and developed suggestions as to how design processes can be organised accordingly. A central issue for women's studies in computer science has always been the design of work and software with regard to women's jobs. The new organisation of company structures linked with the use of computers should be used to reduce the gendered division of labour, enable higher qualifications for women, and extend women's career possibilities. In Scandinavia, in particular, several such projects have been carried out involving women computer scientists.

4.

Software development as doing gender

- Software is not neutral. Its abstractions and models are based on basic assumptions that emphasise certain aspects and neglect others, as various studies have shown. Partly because it focuses on "young, male, white users" who also dominate the development teams themselves software has failed to appeal to (and be used by) all groups of the population equally. As such, software frequently contributes to a consolidation of gender relations in their current form. There are numerous examples in the area of computer games. Much of computer scientists' activities involve software development. Gender studies investigates to what extent gender-specific views are inscribed in software concepts, and attempts to make constructive suggestions on how software can be designed so that it can be used by men and women in the same way and appeal to them equally. This requires software design methods that combine a conscious reflection on social contexts with technological development.

5.

History of computer science and basic epistemology

- Women play a marginal role in the history of computer science, which is shaped by both mathematics and engineering. But it is worth tracking these women down. In Germany, there were initially a few pioneering developments in the fields of the computer as a medium and innovative interface design. Women's and gender studies have produced a number of epistemological considerations questioning and addressing the dichotomy of technology and social aspects, abstraction and specific application, intellect and body. These theoretical considerations could provide an excellent and stimulating background for newer developments of "embedded" or "ubiquitous" computing.

Integration of gender studies content into the curriculum:

A specific gender studies module could be suitable in the area of applications of computer science. This could be integrated into the curriculum of a Master's programme.

In Bachelor's courses, it appears more appropriate to integrate this content into existing modules. All the gender issues above are ideal for integration into courses on "Computer Science and Society". "Software development as Doing Gender" could become part of "Software Engineering". "The Information and Knowledge Society and Changes in Gender Relations" and "History of Computer Science and Basic Epistemology" should be covered in "Introduction to Computer Science". Questions of differing access and technology culture should play a role in applications-based modules such as

eLearning, eBusiness, eGovernment etc.

Degree Stage:

Mixed-gender groups are not ideal for addressing the situation of women in a male domain at the beginning of the degree. This could instead be done in (temporary) single-sex groups. The visibility of gender is initially unsettling in such a context. However, an academic debate on changes in gender relations including globalisation, information technologies and the internet, and a clarification of the role of gender relations in the history of computer science should be part of a good introduction to computer science. This makes students aware of the breadth of development in the field and highlights the risks of a restriction of the discipline if gender issues are neglected.

Gender issues could form an independent module after the introductory phase.

The two-week "Informatica Feminale" takes place annually at the University of Bremen and the FH Furtwangen/University of Freiburg. This is a very successful and popular, compact programme that forms part of computer science degrees, and is offered for women only. Many universities recognise examinations from this programme as regular course modules in their examination regulations. This should be explicitly mentioned in all study regulations.

Basic Literature/Recommended Reading:

- Bath, Corinna; Kleinen, Barbara (Hg.): Frauen in der Informationsgesellschaft: Fliegen oder Spinnen im Netz? Mössingen-Talheim: Talheimer Verlag 1997
- Erb, Ulrike: Frauenperspektiven auf die Informatik. Infomatikerinnen im Spannungsfeld zwischen Distanz und Nähe zur Technik. Münster: Westfälisches Dampfboot 1996
- Hoffmann, Ute: Computerfrauen. Welchen Anteil haben Frauen an Computergeschichte und -arbeit? München: Rainer Hampp Verlag 1987
- Kirkup, Gill et al. (eds): The Gendered Cyborg. A Reader. London and New York: Routledge 2000
- Kreutzner, Gabriele; Schelhowe, Heidi (eds): Agents of Change. Virtuality, Gender, and the Challenge to traditional University. Oplanden: leske+budrich 2003
- Oechtering, Veronika; Winkler, Gabriele: Computernetze - Frauenplätze. Frauen in der Informationsgesellschaft. Opladen: leske+budrich 1998
- Ray, Sheri Grainer: Gender Inclusive Game Design. Massachusetts, USA: Charles River Media 2004
- Schelhowe, Heidi (Hrg.): Frauenwelt - Computerräume. Proceedings der GI-Fachtagung 21.-24.Sept.1989. Berlin, Heidelberg, New York: Springer 1989
- Schmitz, Sigrid; Schinzel, Britta (Hg.): Grenzgänge: Genderforschung in Informatik und Naturwissenschaften. Königstein: Ulrike Helmer Verlag 2004
- Conference Proceedings "Women, Work and Computerization" 1986ff.