Gender in IT education and work: What knowledge counts?

Summary
In this project, we propose to explore how men and women (students and IT professionals) construct gender and computing in their daily work/student life. The background for the study is the persistence of the under-representation of women in computer science and IT.

Background
The number of women at the computer science (CS) and IT programmes at the Faculty of Science and Technology, Uppsala University is very low. Moreover, the number and percentage of women has dropped in the last couple of years. The below table shows the percentage of women at our programmes in 2004.

<table>
<thead>
<tr>
<th>Program</th>
<th>Perc of women</th>
<th>Perc of men</th>
</tr>
</thead>
<tbody>
<tr>
<td>Computer Science</td>
<td>8.5</td>
<td>91.5</td>
</tr>
<tr>
<td>Information Technology</td>
<td>15.8</td>
<td>84.2</td>
</tr>
<tr>
<td>Systems in technology and Society</td>
<td>38.7</td>
<td>61.3</td>
</tr>
<tr>
<td>Engineering Physics</td>
<td>17.5</td>
<td>82.5</td>
</tr>
</tbody>
</table>

There is a large body of research on the under-representation of women in IT\(^1\). Nevertheless, the trend is currently negative at most IT-related programmes and educations in Sweden, as well as in the US and the UK and a number of other Western countries. However, much of the research focuses on equity aspects and numbers placing the problem with women\(^2\), and leaves important questions unanswered, for instance, how gender segregated processes relate to the construction of computing.

Feminist research suggests that the problem of gender and IT is far more complex than a mere matter of under-representation focusing on the differences between men and women, obscuring the under-lying issues. Corneliussen\(^3\)

---


discusses how gender is constructed in relation to computers (subject positions), shaping the way real men and women orient themselves in relation to these gendered subject positions. Björkman and Trojer\(^4\) suggest that the problem is an epistemological one, i.e. a problem of what knowledge counts and whose knowledge counts in CS/IT. Cukier, Shortt and Devine\(^5\), discuss the narrow definition of IT that dominates the discourse. Clegg\(^6\) discusses the relation between gender, education and computing arguing that gendered practices have pervaded the area of computing throughout its history and that these practices have maintained an "outsider" position for women and girls. Computing at university level has become an elitist discipline focusing on formal methods and AI, excluding other ways of doing computing, in particular more creative approaches to computing. These practices also maintain a strict separation between "experts" and "users" further exacerbating the exclusion of women from "real" computing.

Gendered practices are also played out in the actual IT development and design process. Greenbaum\(^7\) argues for instance that the IT development process is gendered in that “Good system design”, like "good science" falls on the male side of the [male/female] dichotomy.” (p 11). This gendering of systems development shapes the development process, and determines the questions asked, the methods used and the outcome of it, focusing on objectivity, detachment and a separation between things and people.

The under-representation of women in CS/IT is related to epistemological issues of what computing is and what and whose knowledge counts. Women shun IT/CS not only because of lack of confidence/experience with computers, etc, but also because they perceive of the area as having a narrow technical focus infused with machismo and masculinity. The gendered nature of computing creates positions that are difficult to inhabit for women, and possibly even detrimental to their identity as women.

The project

The focus of the project is to investigate the complex processes between gender, computing and the production of legitimate knowledge. The project will examine and analyse the constructions of gender and computing/IT in women’s and men’s daily work practices. More concretely, the study will answer the following questions:

- How do women and men in IT think and talk about the area, about what CS/IT is, what computing and programming/systems development are?
- What does “computing” mean to women and men? And what does “programming/systems development” mean according to the informants?

---


Who is a “good” computer scientist, programmer, and/or systems developer? What makes a “good”, legitimate scientist, programmer etc in the context of IT/computing? How do these images relate and connect to cultural conceptions of gender?

What knowledge “counts” in the systems development process and how is this knowledge represented?

What norms and structures shape and determine the careers of men and women in IT?

In relation to these issues, we would like to explore how their perceptions of IT affect their attitudes about pursuing a career within the area. It is important for us to make connections to the under-representation of women in our programmes, and of course in CS/IT in general, since it is an urgent issue that needs addressing.

We plan to include students in CS/IT, students in non-IT areas, and people working in CS/IT professions in our study. Since "our" education programmes focus on the design, development and operation of IT systems we will primarily include people working with that kind of careers, rather than careers involving IT in terms of its use as a tool, for instance, librarians and civil servants. This is not to say that we think of design and development of IT as superior, or more sophisticated careers, but that these are the kinds of careers we are concerned with.

We will use a qualitative research approach, comprising in-depth interviews with informants from the groups described above. The project is based on the view that gender is socially constructed, problematizing the research question through a "doing gender" perspective. In this perspective the object of analysis is how gender and gender order are produced and reproduced in a particular context.

Our project targets the individual level as well as the societal level (in the terminology of KK-stiftelsen) in that we intend to explore how views and perceptions of computing and computers are communicated and how they affect individuals.

Outcome and dissemination

In relation to the under-representation of women, the question is what we at the IT department, as faculty, can do to change our own perceptions of CS/IT and the way these are passed on to and embraced by the students. In what ways can and should these perceptions change to better reflect a wider diversity of skills and expertise? How can these changes be reflected in our curricula and teaching practices?

---

8 Inger Boivie explores this issue in her forthcoming thesis, however, not from a gender perspective.
9 Inger Boivie has contacts with practising IT professionals within a number of organisations. Student informants will be recruited at Uppsala University.
The results of the study will be used as input in the work of the gender equity group at the IT department. One possible way to disseminate the results would be to organise workshops with teachers at the IT department, in order increase the awareness CS and IT in relation to gender. This approach would build on the work described in 11. Such workshops would facilitate a deepened understanding of the under-representation problem, and provide a starting point for identifying measures and actions for increasing the diversity on the CS and IT programmes.

We plan to present the results of the study in an international journal in the CS/IT area.

11 Björkman, Dackman & Dahlskog. (2005). Gender Research and Feminist Theory Meets Computer Science Educational Practice. Accepted for presentation at the gender research conference “Teori möter verklighet” Malmö, 19-21 May 2005; and in the GLIT project "Epistemological Issues in Computer Science Education from Gender Research Perspectives".