

INFORMATICA FEMINALE

Summer University for Women in Computer Science

Educational Pilot Project

at the Department of Mathematics and Computer Science

at the University of Bremen

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Introduction:

In Germany the number of women studying computer science has reached a dramatical low level. While in 1979 the percentage of women who started studying computer science in Germany reached about 20 %, their percentage has declined to 7,4 % in 1993 and has lightly increased to 9,7 % in 1995 (see Rügge 1993 and Oechtering/Behnke 1995). This trend is similar in other European countries and in the USA (see Falck et al. 1991 and Spertus 1991).

Up to now, efforts to increase the participation of women in computer science are mainly concentrated on informing girls and women on engineering and natural sciences and motivating them to study these fields. These efforts are often based upon the idea that the low participation of women in computer science is due to their assumed deficits in logical and technical competences and their lack of self-confidence (compare Schiersmann 1987).

Therefore several educational pilot projects aimed at a special education for girls and women in these areas.

With the spread of information technology into nearly all sectors of labour and life during the last fifteen years the image of computer science has changed. In the '70s and early '80s there existed only a diffuse *public* idea about the subject of computer science. It was supposed to be something between mathematics, logic and electronics. With the proliferation of computers and the increasing knowledge about their use, computer science was more and more associated with a place dominated by computers and with a place of code hacking, net surfing and techno-fascinated computer-freaks (compare Håpnes/Rasmussen 1991).

Investigations about the declining rate of women in computer science and about the reason why so many women give up their studies in computer science reveal similar causes: The main obstacles for women in computer science have been identified in the culture of this discipline which seems to be dominated by a techno-centered image and by the habits and working styles of so-called computer freaks. Further obstacles are caused by the divergence of (socially constructed) stereotypes of technical experts and of femininity (see Janshen/Rudolph 1987, Roloff 1989, Schmitt 1993).

Previous measures for women's empowerment in computer science do not sufficiently consider the influence of such structural and "cultural" conditions on the participation of women in this discipline. Up to now measures for increasing the women's rate in computer science aim especially at improving their access to the computer. In other words, women's skills in using the PC as an instrument have been supported. But as yet, it has been neglected to promote as well the *remaining* of women in high qualified professions like computer science professions.

Compared to other science and engineering professions, the situation in computer science is in a way exceptional, because at least there exists a certain potential of women at all levels of qualification: On the one hand these pioneering women are important as role models for female careers in computer science. On the other hand in Germany a relatively high potential of them is organised in the Special Interest Group "Women's Work and Informatics" (Fachausschuß Frauenarbeit und Informatik) of the German "Society for Informatics" (Gesellschaft für Informatik – GI). This group is very engaged in promoting women's interests in computer science and has developed several activities in this field like organising conferences and discussions, publishing a journal, producing a brochure for motivating women to study computer science and so on. At several universities, there exist local groups of female computer scientists, organising women's tutorials at computer science departments or promoting the domain of women's studies in computer science. Moreover, several investigations in the broader research of women's studies are dedicated especially to the subject "women and computer science". So, several specific problems in this field have already been well analysed, and the results will be useful for further empowerment of women.

Apart from the activities of female computer scientists, also other conditions create an atmosphere of change in computer science: There are several discussions about guidelines and paradigms of this discipline. Paradigm shifts are discussed which seem to become necessary because of the technological development and because of arising social requests to new technologies. Furthermore, discussions at universities on evaluating and improving education in computer science have created an open atmosphere for testing new forms of studying and teaching.

The University of Bremen has taken part in the discussions on women's studies and women's empowerment in computer science from the very beginning. The first German conference on women and computer science "Frauenwelt - Computerräume" was organised 1989 by the GI-Working Group in Bremen. And the first professorship on women's studies in computer science is going to be established at the computer science department of the University of Bremen.

Motivated by these developments, the idea of a summer university for women in computer science was born. In 1994, the authors of this note developed a concept for a pilot project INFORMATICA FEMINALE, which was submitted to the federal and states commission on educational matters (Bund-Länder-Kommission für Bildungsplanung – BLK). The proposal got positive referees' reports, but the decision of the commission is still pending, because the commission had a severe lack of money in the last two years.

In the following, we sum up the focal points of this project.

Objectives of the Pilot Project

The idea of the pilot project INFORMATICA FEMINALE is to organise summer universities for women in computer science. The summer universities should be a place, where new forms of teaching and learning in science and engineering disciplines can be tried out in an exemplary manner for computer science. Further the INFORMATICA FEMINALE should be a place, where such new methods are analyzed especially with regard to their potential

- for motivating women to study computer science or other engineering disciplines,
- for motivating them to pursue an academic career in an engineering discipline,
- for motivating them to participate in the discourse about curricula and didactic development, and
- for motivating them to choose permanent positions in a field of technology.

In order to get good results the summer university should take place at least three times in the context of the pilot project.

1. The Summer Courses

The nucleus of the INFORMATICA FEMINALE consists of a specific offer of seminars and classes in computer science on a university level. The teaching offers should be designed compactly as intensive courses by women for women.

The courses should be performed by female scientists and didactic experts, and by women from practice. The curriculum of the summer university should comprise specific knowledge in computer science as well as didactic knowledge and (practical) experiences in this discipline. The teaching offers should cover the whole spectrum of computer science, that means the domains of theoretical, practical, technical and applied computer science, and it should refer to the existing German curriculum recommendations which have been published by the “Gesellschaft für Informatik”. The results of current curriculum discussions will be taken into account as well as gendered experiences with the curricula of different universities.

A variety of offers is supposed to be realized:

- fundamental and special courses
- practical courses
- planning games
- excursions
- presentations of special (industrial) applications
- workshops and future workshops
- plenary sessions, lectures and panel discussions about actual subjects.

Potential participants of the summer university should first of all be female university students of computer science, but also students of other disciplines or teacher students in computer science. The summer university may also serve for women to continue their studies, especially to refresh relevant professional knowledge, or to qualify them for a professional reentrance, for example after an interval of child care and education.

The summer university is directed to participants all over Germany, and it is open for international participants. The lecturers should be invited from Germany as well as from other countries. We try to arrange that the completion of summer university courses will be accepted at least at the computer science departments of German universities. In this way, students could complete parts of their studies by visiting the summer university.

Accompanied with the summer courses, there should be organised opportunities for discussions and exchange among lecturers and between lecturers and students of the summer university about curricula matters but also about individual conditions of living, learning, and working. On the one hand, such networks and discussions will support the reflection of didactics and methods of teaching. On the other hand, they will be useful to help students in finding their professional orientations.

2. Continuation workshops for scientists

As mentioned above, feminist studies about the declining rate of women in computer science have come to the result that the main obstacles for women in technical disciplines consist in structural and informal conditions of the scientific and academic culture. In order to take into account these findings, it is planned to install special workshops within the context of the pilot project, where such obstacles are investigated and made transparent. These workshops are directed to the lecturers of the summer courses as well as to other female computer scientists and sociologists. The workshops should be temporally independent of the summer courses, but they should refer to the experiences of these courses. Besides, the workshops should contain special offers for women who are interested in a scientific career in computer science. Such offers could consist in didactic courses or in the mediation of knowledge about structural conditions in scientific and academic fields, for example how to establish external cooperations and networks in sciences.

3. Workshops for didactic and curriculum discussions

In order to prepare the three summer universities of the pilot project, there will take place further workshops especially for the lecturers of the summer universities, but also for didactical experts and other interested female computer scientists. In these workshops, the thematic spectrum of the summer classes should be discussed and didactical methods should be developed and reflected. Existing computer science curricula and potential changes should also be discussed in the workshops, such as curricula innovations which take into account that women are deterred by a "hacker culture" in computer science (compare Håpnes/Rasmussen 1991), or the findings that theoretical computer science for women often serves as sort of an access path to computer science in the beginning of their studies or of their scientific careers (Erb 1996 and Erb 1997).

Outlook

This is in short the conception of the pilot project INFORMATICA FEMINALE. Though the proposal of this project has been welcomed by the Federal Minister of Science and Education, its realization has not yet been decided.

However, in a small pre-project, Ingrid Rügge and Veronika Oechtering have made an inquiry among female computer science professors in Germany, and they have organised a curriculum workshop in December 1995 in Bremen. Both, the inquiry and the workshops have shown that there is a great interest for the summer university especially among female computer scientists

and among researchers of women's studies. It has also become evident that there is a great potential of competent lecturers for the INFORMATICA FEMINALE.

In the pre-project, there was also developed an information brochure directed to girls and women who are interested in studying computer science. This brochure gives an overview on the contents of computer science and informs about computer science professions. Especially, some female computer scientists describe their professional ways and experiences. It is shown that a career in computer science does not exclude a life with family and children. This brochure is distributed to schools and other interested institutions to encourage girls and women to start studies in computer science.

We are interested in further, especially international contacts concerning the summer university. Interested persons, who would like to participate at the summer university as lecturers or as students, or who have further suggestions and ideas are requested to contact the authors of this paper.

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