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## Feminist Science Studies at German Universities - a First Account<sup>1</sup>

Smilla Ebeling and Helene Götschel

### Introduction: Science and Feminist Studies - Two Worlds That Don't Meet?

Feminist science studies, which do not have a unified term so far in the German debate<sup>2</sup>, regard mathematics, science and technology within their historical and social context (Heike Kahlert 1996, Heike Wiesner 1994). This critical contextualization of math-natural scientific thinking and acting is not regarded as a task of the corresponding disciplines but is linked to other disciplines like the history and philosophy of science, didactics or science and technology studies. Therefore, feminist science studies cannot be worked out within mathematics, science and engineering at all because they do not make sense within the scientific self-understanding (Margarete Maurer 1989, Marlies Krüger 1989). Different from the humanities and social sciences, women's and gender-specific contents in research and teaching could hardly be established in mathematics, natural and technical sciences so far. Making everything even more difficult, courses at German universities are very disciplinary and there don't exist women's studies programs (or STS programs) so far. By comparison with the situation in the USA<sup>3</sup>, students of science and engineering fields hardly get in touch with gender studies and feminist theories. Up to now the long-standing efforts for an institutionalization of feminist science studies into science and engineering departments at German universities are still scarcely successful and have just recently taken a promising turn.

In (western) Germany, analyses of mathematics, natural sciences and engineering fields considering perspectives of gender relations began in the late seventies, when female students and professionals of mathematics, natural sciences and technology were able to share their experiences at the "Congress of Women in Science and Technology". This annual meeting of 300-600 women in higher education, professional training or employment in scientific and technological professions is organized by a group of volunteers. Although it takes place independently of any governmental or academic institutions it is the most important platform in German language for the exchange of experience, ideas, and activities of female scientists, engineers and craftswomen.<sup>4</sup> In the mid-eighties, drafts of the participants of the 'Congress of Women in Science and Technology' were mainly oriented towards the "methodical postulations of an engaged women's research" (Maria Mies 1984), as discussed among the activists of the western German women's movement and feminist social scientists. The natural scientists tried to transfer the social science theses of "a conscious partiality for women" into mathematics, science, and technology and tried to add "specific female experiences" to the theoretical development of these sciences. Furthermore, they analyzed to what extent contents and methods of these sciences were determined by their male contexts.

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<sup>1</sup> We want to thank Birgit Bauer, Brian Ishaug, and Petra Lucht, for helping us to translate this article into English. In addition, we translated a lot of German quotations into English.

<sup>2</sup> Besides the technical terms "Women's and Gender Research concerning Mathematics and Natural Sciences" one can find terms such as "Women's Studies concerning Natural Sciences and Technology", "Feminist Critique of Natural Sciences", "Feminist Analyses of Natural Sciences" as well as "Feminist Natural Sciences and Technology Research".

<sup>3</sup> See Evelyn Fox Keller (1995). There are courses called 'women's studies' at some German universities, but they don't cover the same subjects as 'women's studies' programs in the USA. They are reentry programs for women scholars after a long interruption of their education, due to family-life for example. In summary the subjects can be described with what Evelyn Fox Keller (1995) called 'women in science'.

<sup>4</sup> Helene Götschel 1997. Götschel (2001) gives a history of the 'Congress of Women in Science and Technology'.

They asked for changes through the rising participation of women and through a "specific female interest of cognition" (Margarete Maurer 1989). Parallel to the discussions at the "Congress of Women in Science and Technology" in the middle of the eighties, feminist social scientists at German universities started being interested in women's studies concerning natural and technical sciences. Mostly, they referred in their feminist scholarship to writings of US-American women theorists<sup>5</sup>.

Parallel to this discussion, women who were engaged in feminist university politics tried to achieve an institutionalization of feminist science studies. Depending on their specific interests they wanted to implement feminist science studies in social science departments, in natural science departments, or in new interdisciplinary structures like gender studies departments. In 1988, for example, five women researchers joined in the working group "Interdisciplinary Women's Studies on Science and Technology". They shared the desire "to bring in 'gender' as a necessary category of cognition into our specific working fields in the area of science studies". Their aim was to make visible "the international level of historical, scientific and social theories concerning natural sciences and technology from the perspective of gender relations" by organizing public meetings at German universities (Barbara Orland and Elvira Scheich 1995). The women scientists of this study group for example organized an "International Colloquium for Science and Gender - The Recent Level of Controversy on Evelyn Fox Keller's Research on Natural Sciences and Technology" in 1990 at the Technical University of Berlin. During the nineties, a rising professionalism of the interdisciplinary field of feminist science studies took place at social sciences and humanities in the Federal Republic of Germany. Increasing numbers of women trained both in the natural sciences and in the social sciences bridged the gap between "nature" and "culture" in their research.

### The Institutionalization of Feminist Research in the Federal Republic of Germany

In the meantime, feminist research has been integrated into the history of science. In addition science studies have started to integrate feminist approaches and at the same time this interdisciplinary field is getting closer to science, although up to now feminist classes are only anchored in the curricula in Liberal Art's departments. "In science and technology there are only a few approaches to institutionalize it" (Heike Kahlert 1996, 28). According to Kahlert, instead of integrated classes one can find a lot of events dealing with issues concerning women's or feminist's topics. They are often in the form of lecture series, women's weeks, summer-universities and autonomous study groups, but none of these events can give class credits. The abundance of these events again points out that there is a large interest in feminist theories and women's studies among students.

Today, women who are engaged in feminist university politics, make an effort to change the structures of many German universities in order to anchor feminist teaching and research into math and natural science departments and thereby give students of science and technology the chance to get in contact with gender studies. Changing the structures of German universities is in general a very difficult aim, since the German universities are very bureaucratic, resistant to changes, and ponderous as opposed to the more economic and therefore more flexible system of the universities in the US. In addition, it is not easy to incorporate interdisciplinary research, like feminist science studies genuinely are. A scholar can only get a professorship, if she or he has attained - compared to the academic careers in the US and many other

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<sup>5</sup> Undoubtedly during the eighties Susan Griffin, Evelyn Fox Keller and Carolyn Merchant were among the most famous authors in (Western-) Germany. In the nineties, among others, attention is paid to the works of Anne Fausto-Sterling, Donna Haraway, Sandra Harding, Helen Longino and Londa Schiebinger.

countries - an additional disciplinary qualification called 'habilitation'.<sup>6</sup> In order to give a better picture of the situation we will list feminist classes and lectures in departments of science and technology at some selected German universities.

### *University of Bremen*

The first successful step toward an incorporation of feminist science studies into the science departments was made in fall 1988. The University of Bremen granted an application for an interdisciplinary, feminist professorship for "Women's studies and teaching in science and technology." The professorship was expected to be set up either in the department of biology, chemistry, physics or electrical engineering, but the staff members of all departments rejected the idea of creating this feminist position and none of them offered it, even though there was funding for it (Barbara Debus 1989, Marlies Krüger 1989). Caused in part by pressure from the students, the University of Bremen demanded that the department of biology invite guest-professors for the feminist professorship in order to facilitate feminist teaching in the department of biology (Gudrun Fischer 1995).<sup>7</sup> Since the idea of a feminist professorship seemed to fail, the interdisciplinary "Center for feminist, women's, and gender studies" was created and the University of Bremen appointed a foundation-committee. The concept of this committee was to have research, teaching, and study done in both the feminist center and in science departments. At the same time an introduction of feminist teachings was supposed to be obligatory and integrated into the curricula of the science departments. Moreover it would be possible to take "Feminist and Gender Studies" as a main subject in science. Additionally, the feminist center will have the two professorships for "Feminist Research on Science and on Environment" and "Women's Studies and Technology". The latter one is already given to Susanne Maaß at the faculty of mathematics and computer science, but the first one is not filled yet. In March 1998 the University of Bremen granted the creation of the "Center for Feminist, Women's, and Gender Studies" (Gründungskommission 1997). In 1999 the senate of Bremen granted this Center, too, so that the members could start their work.

Furthermore, the University of Bremen commits to a 'Guideline for the Promotion of Women' in which all departments must support women. This guideline demands that all departments develop a specific set of 'Guidelines for the Promotion of Women'. In addition, the departments are asked to develop and offer feminist classes. The departments are not forced to offer feminist classes by themselves, but the guideline of the university do not allow the departments to reject an application for a feminist class without heavyweight reasons.

From 1996 to 1999 one lecturer offered five feminist classes in the department of biology and in the department of political science. These classes have been a fixed part of the curricula<sup>8</sup> and the number of student taking them have averaged between 6 to 10, most of them women. The funding was provided by a central budget of the University of Bremen for feminist

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<sup>6</sup> In order to get a habilitation, a scholar has to do research on one topic for about five years. The results have to be published. Recently, this structure might be changed by reformation and internationalization of the German universities. There will be so-called 'junior professorships', which enable younger scholars to work as professors without habilitations.

<sup>7</sup> Many guest professors have been invited so far, including German and US-American woman scientists Regine Kellek, Elvira Scheich, Dagmar Heymann, Ruth Hubbard, Evelyn Fox Keller, and Donna Haraway.

<sup>8</sup> At the University of Bremen students of science have to take one class dealing with political and epistemological topics. These feminist classes have been accepted in this realm. The issues were: "Ecofeminisms - a Critical Revision of its Approaches", "Introduction into Feminist Critique on Biology - Analysis of Contents", "Evelyn Fox Keller's Studies of Science and Technology", "Introduction into Feminist Critique on Biology - Structural Barriers for Women in Biology", and "Introduction into Feminist Research of Environment".

lectures. After the lecturer left the University of Bremen, a guest-lecturer from the Marburg University gave a feminist class in the department of biology in the summer of 1999. Only under accordance to the guideline for women's support, mentioned above, could the lecturers offer these classes. Even with the guideline in place, the atmosphere in the department of biology is, according to the lecturer, biased or even hostile against feminism.

An interview of students in the department of computer science about the need for a seminar for women resulted in the following conclusions: Women Graduate students would like to take seminars for women and, in addition, would like more female teachers. However, undergraduate students did not like the idea of women's seminars since they regard concepts like women's support, women's classes, as well as emancipation and feminism as negative.<sup>9</sup>

### *Berlin Universities*

The department of civil engineering at the Technical University revised its curriculum and a group of students, assistants, and one professor created the feminist focus area "Gender Planning" in 1994 (Kerstin Zillmann 1999). The department of landscaping also revised its curriculum in 1990 and therefore a feminist study course was created as well (Ursula Flecken 1994). However, not one single feminist class has been offered yet in the department of landscape planning, but a new professor for the focus area "Gender Planning" started her work in fall 1999.

Since 1989 the women's class "Feminist Research on Environment" has been offered at the Technical University of Berlin. This class is offered for students from different departments. It has been very successful and a large number of female students have attended and appear to appreciate it (Carola Arndt et al. 1996).

In the computer science department several classes for women including a class for women programmers have been offered. In winter 1998, a class titled "Women as Teachers and as Students in Computer Science" was offered and the students who took the class received course credits. In addition, a class titled "Women's Research in computer science" was also offered, but the students didn't get credits and only three students took the class. Since 1991 a class for women programmers has been offered during the summer break in order to give female students the opportunity to practice programming. In winter 1991, an official position was created in order to organize these classes. Since this time, these women's classes have been running every summer break. Moreover, the department of computer science provided a computer-room for women only as an experiment. This computer room has been running for about three years now.<sup>10</sup> The main goal of these means is to stop the decline in the number of women enrolled in computer science.

### *Braunschweig University*

Between 1992 and 1997 an assistant in the department of History of science gave several feminist classes, which were taken only by women, even though men were welcome to attend. After the assistant left the Braunschweig University in 1997, a new professor offered feminist

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<sup>9</sup> Callies and Rügge explain the different meanings with the different age of the students and with the belief of younger students that in future "everything (concerning equal rights) will be better soon" (R. Callies and I. Rügge 1992, 63).

<sup>10</sup> Women's rooms are not uncommon in computer science. For example they exist at Karlsruhe University, Paderborn University, Lübeck University, and at the University of Bremen. Dortmund University is planning a whole new subject on computer science for women only.

classes about research on sex and gender as well as feminist science studies. These classes have always attracted only a few students and the teacher believes that this is not a sign of a loss of interest but is due to an increasing pressure on the students to study fast and straight.

### *Marburg University*

In the biology department, two assistants gave seven classes concerning feminist issues between 1990 and 1994.<sup>11</sup> "The office for support of women's research" at the Marburg University financed these classes. Although the students could not get course credit, about 10 to 15 mainly female students took the classes. The staff members in the department of biology either tried to control or to ignore the classes and since the teachers left the university there have been no further feminist classes. Additionally, an integration and fixation into the curriculum did not happen. Today, the "Interdisciplinary Planning-Group Gender Studies" offers feminist classes in different departments at the Marburg University with the long-term goal of developing the degree of "Gender Studies".

All these first steps of success at the different German universities described above cannot hide the fact that the process of institutionalization of feminist science studies in science is just starting in Germany and that further intensive efforts at the universities are necessary in order to set up qualified professorships for women's and gender studies in science.

### Promoting Gender Research/Feminist Research in Mathematics and Natural Sciences at the University of Hamburg

In comparison with the German development in general the situation in Hamburg was even worse. Gender studies/feminist studies could not be established in mathematics and science departments at the University of Hamburg so far. Nevertheless, there exist intense efforts to integrate feminist contents into the teachings of science and technology departments, especially on behalf of the 'Joint Commission and Coordination Center of Women's Studies and Women's Research'. The 'Joint Commission' is a cooperating committee among seven Hamburg Colleges and Universities in the field of Women's and Gender Studies. The main tasks of this commission are to initiate joint scholarly work and to coordinate seminars, reentry programs, and lecture series. Furthermore it supports the implementation of a Women's and Gender Studies program. For ten years now, sporadic interdisciplinary women's research seminars concerning natural sciences and technology have been offered at the universities, academies, and colleges in Hamburg, financially supported by the 'Joint Commission'. But in her study "Women's and Gender Research in the Teachings at Universities in Hamburg" Heike Kahlert mentions that the natural sciences and mathematics along with the economical sciences got the lowest ranks for offering women-specific seminars at different departments of the University of Hamburg. The evaluation of the women's university catalogues of the years 1984 through 1996 as well as a written poll concerning the level of institutionalizing of research on women and gender at the specific departments showed that almost no feminist seminars had been offered so far. In the departments of physics and chemistry no specific seminars on women or gender in science had taken place until then. In the department of mathematics only three seminars had been offered, among them two seminars with historical focus at the department of history of science, mathematics

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<sup>11</sup> The title of the Seminars are: "Sex differences in Behaviour and its Physiological and Ethological Bases", "Female-Male; Aspects of Sex differences in Humans and Animals", "Women and Science: Critique on Science and New Approaches in Feminist Research", "Biological Determinism of Sex roles in Human Ethnology", "Sex differences in Communicative Behaviour", "Biology of Reproduction and Gene technology - it's Relevance in Polarization of the Sexes", and "Development of the Gender Model within Women and Men - Biological Bases and it's Meaning".

and technology (Heike Kahlert 1996). At the institute for anthropology, a class with a women's specific issue called "The Picture of Women in Biology", has been running for more than 14 years now and is still being taught by the same teacher. Students of anthropology and of cultural studies can get class credits and the number of participants is always high.<sup>12</sup>

Since the math and science departments of the University of Hamburg - aside from the one seminar in biology - offered no women's studies topics or feminist seminars on their own behalf so far, the question was raised, what kind of activities the 'Joint Commission' could establish in order to open these departments for woman's studies or feminist teachings. In general terms, a political framework has already been created within the 'Guidelines for the Promotion of Women' at the University of Hamburg, opening up innovative possibilities. Under the headline "Feminist Studies and Research" it is stated:

The courses and study offerings at the University of Hamburg should include issues out of the area of feminist studies and research. They are to be considered in the studies and examination regulations in such a way that the achieved results can be considered for credit. On the basis of existing beginnings in teaching and research, departments and institutes cooperate with the 'Joint Commission' and the Committee for Teaching and Studies." (Frauenförderrichtlinie 1996)

In addition, in other countries there is no lack of experience with feminist courses. For example, there are numerous international and interdisciplinary feminist analyses of biological and physical-chemical sciences as well as a great numbers of studies on the systematical exclusion of women from natural sciences and technology through the centuries. By now they add up to several German bibliographies (Karin Diegelmann and Agnes Sandner 1992; Margarete Maurer 1993; Maren Landschulze 1997). Women students of the sciences and disciplines have emphasized their needs for feminist science theories again and again. Topics have been mentioned like genetic technology, ecology, definitions of the body, etc. (Dagmar Filter 1998, 6-7). Nevertheless, no corresponding seminars have been established at science departments so far. Both international research results and German findings of gender studies are not known or acknowledged among mainstream German natural scientists. Obviously, strong disciplinary structures, lacking pressure and missing creativity have prevented a realization of the 'Guidelines for Promotion of Women'. The 'Joint Commission' therefore decided to show a continuous presence of women's studies and feminist research in math and science departments, first over a period of four semesters inviting lecturers and organizing lecture series for two semesters. This way the national and international results of this research area should be introduced and a first interest be aroused among students, teachers and all those, who engage in reform processes of courses of mathematics, science and technology at the universities, academies, and colleges in Hamburg.

In order to create innovative concepts for a teaching area "Women's studies/Women's research" at math and science departments, the 'Joint Commission' and members of the "Working Group on Feminist Science Studies and Critique of Science" started an intense cooperation. The 'Working Group' consists of 15 women scientists, who have mostly been

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<sup>12</sup> Other classes dealing with women's issues at the universities, academies, and colleges of Hamburg have been: In 1978-88 three courses dealing with women specific issues were offered in the department of computer science. The topics were theoretical approaches within computer science, including the roles of sex and gender in computer science, new forms of work and cooperation, and inquiry of professions. Additional classes were organized only by students but did not give course credits. Today, there exists a study group called ADMINA, which was founded by the 'Frauenbeauftragten' (a person who pays attention to affirmative action guidelines for women's concerns) and consists only of students. At the Technical University, the subject "Gender Planning" has been integrated at the Department of Urban Planning in 1997 (Kerstin Zillmann 1999).

trained within the natural sciences and who are mainly attaining a doctoral degree in the social science and humanities. One goal of the "Working Group on Feminist Science Studies and Critique of Science" is, to overcome the lacking institutionalization of interdisciplinary feminist research within the natural sciences and within science studies.<sup>13</sup> The result of the cooperation was a 'Focus Program', which started in spring 1997 at the science departments for a period of four semesters. Five women of the 'working group' developed and gave two to three disciplinary and interdisciplinary seminars each semester at the departments of biology, chemistry, mathematics and physics: The interdisciplinary seminar "Introduction to Feminist Science Studies" was carried out by Smilla Ebeling (biologist, attaining a doctoral degree in history of science), Helene Götschel (physicist, Ph.D. in social history), and Dorit Heinsohn (chemist, attaining a doctoral degree in pedagogy). This seminar was given in the following two semesters at the departments of physics and chemistry and was followed by the seminar "Latest Research concerning Feminist Science Studies" at the department of physics by Helene Götschel and Dorit Heinsohn. Furthermore, an interdisciplinary lecture series "Women's Studies and Gender Research concerning Mathematics and Natural Sciences" was offered in cooperation with the department of mathematics and the Office of Academic Education for two semesters.

In addition disciplinary seminars in biology, mathematics and physics were held. Courses concerning the topics "Understanding Images of Nature, Gender and Femininity" and "Construction of Sex/Gender in Biology"<sup>14</sup> were carried out by Maren Landschulze (Ph.D. Agriculture), Smilla Ebeling and Julia Lademann (biologist and MA of Public health). The seminars "The Gender of Nature - Feminist Studies in the History of Science" and "Women's and Gender Studies in the History of Science" were offered at the department of mathematics at the institute of the history of science, mathematics and technology by Helene Götschel and Mirjam Wiemeler (chemist, attaining a doctoral degree in history of science). At the department of physics, the courses "Physics in Context - looking at Physics from a Feminist Standpoint" and "Women Physicists Yesterday and Today" were carried out by Helene Götschel.

These seminars of the 'Focus Program' were not part of the curriculum. On the one hand a missing curriculum meant that the lecturers were able to determine the concepts and contents of their feminist seminars on their own. When choosing the texts and methods, they considered that the participating natural scientists had to become sensitive to a reflexive and differentiated view on their sciences and that gaps showed up between the theoretical contents of the texts and the discipline specific experiences and knowledge of the participants that had to be bridged again and again. This was realized through extensive working on texts and detailed discussions in small groups. Both are unusual in science and technology courses at German universities. On the other hand it meant that the natural scientists could not get any class credits for their participation of lectures and seminars because of the different teaching contents and the unusual methods. They participated out of pure interest in feminist topics.

At the beginning and at the end of the seminars an interview of the participants was carried out. In this way, their motivation to work on feminist science studies, their wishes regarding the seminar and their critique of the concept of the seminar was determined. Each of the

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<sup>13</sup> The main work of the 'working group' are brainstorming workshops, which are held every two to three months, and where the members discuss academic projects of each woman in order to support each other's work. Secondly, the 'working group' organizes common projects like conferences, seminars, publications, and cooperation with other NGOs and university groups. The common ground of these interdisciplinary scholars is a feminist perspective with which they analyze the natural sciences.

<sup>14</sup> In the German language, there is no distinction between ,sex' and ,gender'; the German word 'Geschlecht' can mean both or has to be specified further.

woman lecturers wrote a short description of her experiences, and selected members of the teaching staff were asked for an appraisal of the activities on behalf of the departments. On this foundation, an evaluation of the 'Focus Program' was made.<sup>15</sup>

### Results of the Evaluation

One important goal of the 'Focus Program' of the 'Joint Commission and Coordination Center of Women's Studies and Women's Research' is to teach feminist science studies. Offering feminist classes for a period of four semesters is compared to the past continuous and is regarded as one step of the beginning in the realization of this goal. Our interviews show that all classes fulfilled this goal, except the aspect that the intended audience could not be reached in all cases.

The number of participants staggered between 5 and 15 persons and was therefore on the average for theoretical and interdisciplinary seminars on math and science departments of German universities. But one could hardly recognize regularities. So, the number of participants for the seminar "Introduction to Feminist Science Studies" changed in various semesters from 15 to 9 to 5 people. In a striking way the interdisciplinary seminars were more appreciated than the disciplinary ones. While at the interdisciplinary seminars, students and graduates of various departments of the University of Hamburg, the Technical University, the Technical College, the Art Academy and the College for Economy and Politics participated, the disciplinary seminars in physics or biology were visited by a smaller circle, mostly by students and graduates of the corresponding department of the university. But there were exceptions as well. At the seminar "Construction of Sex/Gender in Biology" at the department of biology, only humanistic and social scientists participated. In general, extremely few biologists participated in all seminars. This is hard to explain, since biology - considering its subject - is a discipline, in which a lot of sex and gender related points of critique are obvious and need to be discussed urgently. At the same time, a lot of feminist analyses are available for biology and the linking points are really obvious.

All seminars were on average attended by essentially more female than male students and graduates, although it was consciously paid attention to use a gender-neutral language in the announcement of the seminars. Women exclusively attended the disciplinary seminars. Two thirds of the participants possessed a previous knowledge concerning feminist science studies research. But the natural scientists among them often called it poor or inferior. Participants of all seminars showed an exceptionally large interest in the seminars through continuing, intense cooperation and through very good preparations of texts both from unknown disciplines, and in English language. They gave a positive feedback and stated a strong interest in a continuous offer of feminist seminars at natural science departments. But they required their recognition as relevant for exams, since they regarded their subjects as integrated parts of their disciplines. Also, they would like to choose them as a voluntary program, a minor, or as required courses of their science studies. According to the interviews with the students, we think that the lack of formal integration into the curricula of the math and science departments as well as the fact that the classes do not accompany the traditional research are the main reasons for the small number of participants.

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<sup>15</sup> For a publication of the results see Smilla Ebeling & Helene Götschel (2000): Feministische Wissenschaftsforschung in Mathematik und Naturwissenschaften an der Universität Hamburg. Erfahrungsbericht über einen Förderschwerpunkt vom Sommersemester 1997 bis zum Wintersemester 1998/99. Hamburg (Joint Commission and Coordination Center of Women's Studies and Women's Research, Hamburg). Central passages of this evaluation have been the foundation of this article.

The result of our interviews of selected staff members in different math and science departments showed that those staff members who dealt with feminist critique on science develop a large interest in this subject. Furthermore, they support or explicitly request an integration of this topic into the curricula. On the other hand these staff members gave the advice, to avoid terms like 'critique' or feminism. Thus, the departments neither offer classes dealing with feminist studies on science by themselves nor do they announce official requirements.<sup>16</sup>

In general, the science departments did not meet the 'Guidelines for the Promotion of Women' on their own for a long time. Math and science departments did not actively promote feminist studies and research. For example, the departments didn't inform the students or even made advertisements for feminist classes. Creating criteria, which considers feminists for professorships were not in sight at any math or science department. In the year 2000, this situation started to change (see below).

Furthermore, the math and science departments reacted in different ways to the attempt of the 'Joint Commission' to bring in classes of feminist science studies into the math and science departments. In the departments of mathematics, physics and chemistry, the teachers of the feminist classes found support for the feminist classes, which was dependent on a good and continuous co-operation with staff members in a crucial way. That's why the experiences can be regarded as successful, but the experiences of the teachers also show that there is no unique agreement or benevolent opinion among the whole staff. Often, impeding actions happened.<sup>17</sup> The department of biology did not support the classes in any way. They often did nothing to help and sometimes attempted to impede them partly.<sup>18</sup> In summery, the attempt to integrate feminist classes into math and science departments from outside the departments was dependent on the goodwill of staff members and ended up being difficult. Nevertheless, the classes of the 'Focus Program' have trained a group of students to be highly qualified in Feminist Science Studies, but it still remains unsatisfying that only a small group of students attended the classes and that the 'Focus Program' did not achieve a widespread effect.

### Future goals and suggestions

One further goal of the 'Focus Program' provided by the 'Joint Commission' is the establishment of feminist science studies in math and science departments. Both the experiences of the 'Focus Program' provided by the 'Joint Commission' and the means used at other universities show that the feminist classes are proper means to teach feminist research on science and that there is a large interest in feminist theories among students. In addition, it shows that it is crucial to incorporate feminist classes into the curricula. A comparison of the classes described above point out that a short term offer of feminist classes alone cannot be a proper means for the integration of feminist and women's studies into science departments and that it cannot afford lasting changes in the curricula. Furthermore, the experiences show that whether or not the feminist classes are offered is highly dependent on whether or not there are teachers who are interested and willing to give such classes. In most cases, these teachers are not established in the staff, do not have a powerful position within a department, and only get a small salary, so that they have to have a great deal of idealism in order to push

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<sup>16</sup> The only exception is a class concerning women's issues in the department of anthropology, mentioned above.

<sup>17</sup> For example, one professor removed an advertisement for a feminist class, in addition that same class was not announced on the blackboard in the department, and another class was not announced in the lecture schedule.

<sup>18</sup> Within the faculty the information about the offering of one class was not passed on to a weekly meeting of the department of zoology and the staff members who make the decisions were not informed about the feminist classes, which resulted in difficulties between the lecturers and staff co-operation between lecturers and staff. It also impeded an announcement of the class in the lecture schedule.

for such classes. This situation has also the effect that these teachers work for a relatively short time at a university and when they leave the university, they leave a lack of feminist classes in the departments, since as most cases show, there is seldom a replacement teacher who is engaged into feminist classes.

In total, the offering of a few independent feminist classes that have run for up to two years is a good beginning for the presentation and integration of feminist issues into math and science departments but as a means for the long term establishment of feminist science studies it is not sufficient, especially if the classes are not accompanied by other means. A long-term offering of feminist classes, for example, has to be insured in order to avoid that the feminist classes are not only guest-events. Therefore, it is necessary to get the departments involved, i.e. they have to change the curricula and have to include feminist issues into the curricula in order to enable students to get credit for taking these classes. Moreover, the departments should distribute feminist literature. The experiences at the University of Bremen showed that creating 'Guidelines for the Promotion of Women' could help to offer feminist classes even if departments are reluctant to do so. Such guidelines can be regarded as good and helpful, but not sufficient measures by themselves. In short, the result is that structural and political changes are necessary in order to support the efforts to integrate feminist issues into science. The analysis of class schedules of the universities, academies, and colleges in Hamburg by Heike Kahlert (1996) confirms our results. Kahlert emphasized that the promotion of feminist teaching and of women in science is not only a task for 'Frauenbeauftragte' and for the 'Joint Commission', but that the co-operation with other activist at the universities is also necessary. She also pointed out that establishing and integrating feminist classes is a task of structural policy and listed some means by which this could be achieved. These means include establishing funding for professorships, different types of classes, visiting scholars, supplementary programs, students projects and students awards. Additionally, Kahlert describes, models for the integration of women's studies that have been used at other universities. These models include, for example, the provisions to take on feminist scholars, for provision for new or free positions, the anchoring of women's studies in curricula, the establishment of "women's studies" as a course of study and the establishment of feminist graduate schools. (Heike Kahlert 1996, 85-87).<sup>19</sup>

After finishing the first small stage, like providing feminist literature in the department of physics and waking the interests of several 'Frauenbeauftragte', it is important to promote an institutionalization of feminist science studies. This has already been done on different levels. For example, in 1998 the 'Joint Commission' developed a model in which to facilitate a stronger involvement of the faculties of science. It is a 'Central Teaching pool' for feminist lecturers, which will be financed by the 'Joint Commission' under the condition that the math and science departments provide some means of support. They have to provide feminist literature and the class has to be taught in cooperation of one feminist lecturer with one member of the staff. The class has, in addition, to be incorporated into the curriculum in order to make it possible for the students to get credits.

We suggest measures that operate on a level of structural policy in order to integrate women's and feminist studies into science at the University of Hamburg. First, the 'Guidelines for the Promotion of Women' of the University of Hamburg (1997) are a good basis for the integration of feminist issues into math and science departments in the sense that it helps to demand feminist classes. On the other hand, the 'Guidelines for the Promotion of Women' are not sufficient concerning the requirement to involve the departments themselves. With regard

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<sup>19</sup> We want to mention that Kahlert's suggestions are made for all departments, not only for math and science departments.

to these 'Guidelines for the Promotion of Women', one can demand support in offering feminist classes in individual departments but it does not force the departments to offer feminist classes, themselves.

In detail we suggest the following means as a general basis for establishing a direction in which to proceed: Further feminist classes in science departments have to be financed with funding from special means established by the University of Hamburg, the departments themselves, and by the 'Joint commission'. In addition, the departments have to provide feminist literature (with regard to the 'Guidelines for the Promotion of Women' at least 5% of the budget for the library) in order to provide feminist literature for students. The incorporation of feminist classes into the curricula is essential so that further feminist classes can be offered for credit to undergraduate and graduate students. Moreover, the establishment of an interdisciplinary graduate school in science departments as well as a feminist graduate school by multiple departments would be a proper measure to enable degrees for feminist studies. There should also be further education for staff members and lecturers in feminist and women's studies.<sup>20</sup> Furthermore, the departments should offer qualified positions for feminist science studies in science and open or new positions should be given to feminist scholars. The departments should consider qualifications in feminist theories when deciding to hire new professors in order to facilitate not only feminist teaching but also feminist research. They also have to point out feminist classes to undergraduate and graduate students, and/or advertise those classes. In order to provide students with possibilities to graduate with an arts or sciences degree, the establishment of an interdisciplinary professorship for feminist science studies is as crucial as the establishment of an independent, interdisciplinary subject "Gender Studies".<sup>21</sup>

We want to emphasize that not only feminist teaching but also feminist research is an indispensable means to provide the study of the social and constructive character of science under a perspective of sex/gender-relations. Therefore, feminist professorships as well as subjects of women's and gender studies in science are required. Fortunately, the Hamburg Ministry of Science and Research (Behörde für Wissenschaft und Forschung) shows new political strategies and progress: More than twenty professors, lecturers, and students from eight different universities, academies, and colleges are developing an interdisciplinary and cross-institutional course of gender studies. This course of gender studies will include gender analyses of science and technology and two out of ten new professorships for this program are explicitly dedicated to mathematics and gender studies and to gender and computer science. A third professorship for gender and technology studies is projected. Still, it will be necessary to integrate these interdisciplinary gender studies into the curricula of the science and technology departments.

Finally, we believe that an additional kind of work has to be done. This work operates on the level of the public perception of feminists and women's studies, which needs to be shifted. Since most scientists do not see the relevance of feminist studies, they prejudge and often ignore this realm, particularly in the sciences. It is very important to give women's and feminist studies a positive connotation in order to avoid a barrier to reception and to information transfer. For example, it needs to be stressed that women's and feminist studies

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<sup>20</sup> In June 1999 a symposium took place in cooperation with the 'Joint Commission and Coordination Center of Women's Studies and Women's Research' and members of the "Working Group of Feminist Science Studies and Critique on Science". It was designed to further the education of scholars in science concerning the issue of the integration of feminist science studies into science. For a documentation see Helene Götschel & Dorit Heinsohn 2000.

<sup>21</sup> A professor for such an interdisciplinary feminist professorship should have a qualifications in both, science and feminist studies. Furthermore a strong personality and a 'thick fur' would be helpful.

are actually quite broad in scope in relation to science. Like Elke Sasse, we want to stress that it is important to show staff members, as well as students that ignoring or neglecting the given hierarchical sex/gender-relations in teaching and research be detrimental and is often fragmentary. Women's and feminist studies are good means for positive support of the departments, similar to how it has been used in the US for a long time now. The department of mathematics at the University of Hamburg already regards the feminist classes of the 'Focus Program' of the 'Joint Commission' as positive advertisement, but most of the science and technology departments at German universities are far away from a positive thinking about feminist science studies. About German science and technology departments we could not say, what Londa Schiebinger states: "In my own field of history, for example, the history of women and gender has become an orthodox part of the discipline; a professor who did not employ gender as a category of analysis in a course would be considered irresponsible."<sup>22</sup> Such a positive connotation of feminist research and teaching is as we think a necessary step toward an involvement of math and science departments as well as for a mobilization of students interested in women's studies. Last but not least, it is necessary to build a network of scholars and activists which are engaged in feminist science studies, in order to make continuous, mutable, supporting exchanges of experiences possible.

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<sup>22</sup> Londa Schiebinger 1999, 190

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