

# WHICH CHANGES TO THE CURRICULA DO WE NEED TO ATTRACT MORE WOMEN TO STUDY SURVEYING?

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## ABSTRACT

Among other things decreasing numbers of students beginning surveying studies at German universities has led to changes in the curricula of some universities from surveying to geomatic, geoinformatic or geoinformation. A lack of students, male students, may necessitate activities designed to attract as well more women into studying surveying. But up to now there has been no evaluation of the target groups which should be addressed by this new curricula.

## ZUSAMMENFASSUNG

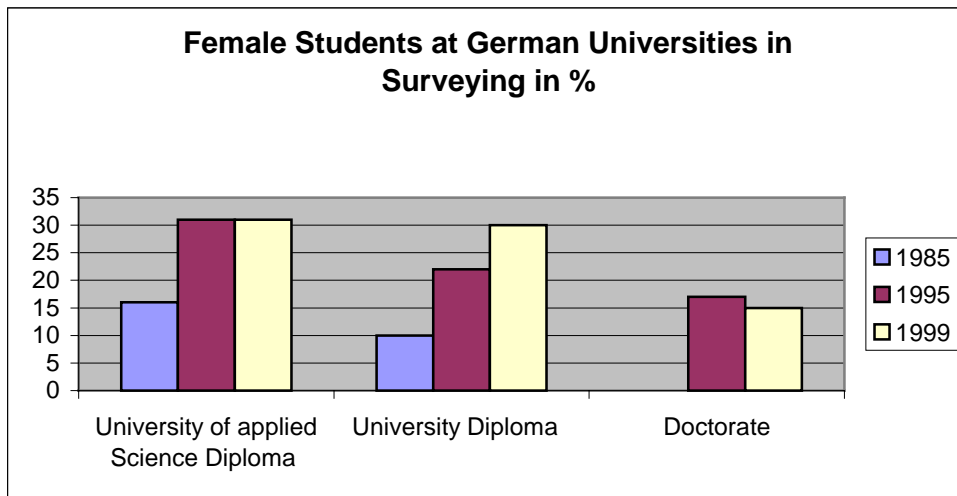
Unter anderem führte die sinkende Anzahl von Studienanfängerinnen und Studienanfängern im Vermessungsstudium an deutschen Hochschulen dazu, dass die Lehrpläne einiger Universitäten und Fachhochschulen von der Vermessung weg hin zu Geomatik, Geoinformatik oder Geoinformation entwickelt wurden. Ein Mangel an Studierenden, männlichen Studenten, erfordert Aktivitäten. Diese sind so zu gestalten, dass auch zunehmend Frauen Interesse haben Vermessung zu studieren. Bisher gab es jedoch keine Untersuchung, welche Zielgruppen mit den neuen Lehrplänen erreicht werden sollen.

## 1. THE SITUATION AT GERMAN UNIVERSITIES IN SURVEYING

The situation in general education for women in Germany is good. There are more women than men with a high school diploma legitimating the study at universities or at universities of applied science.

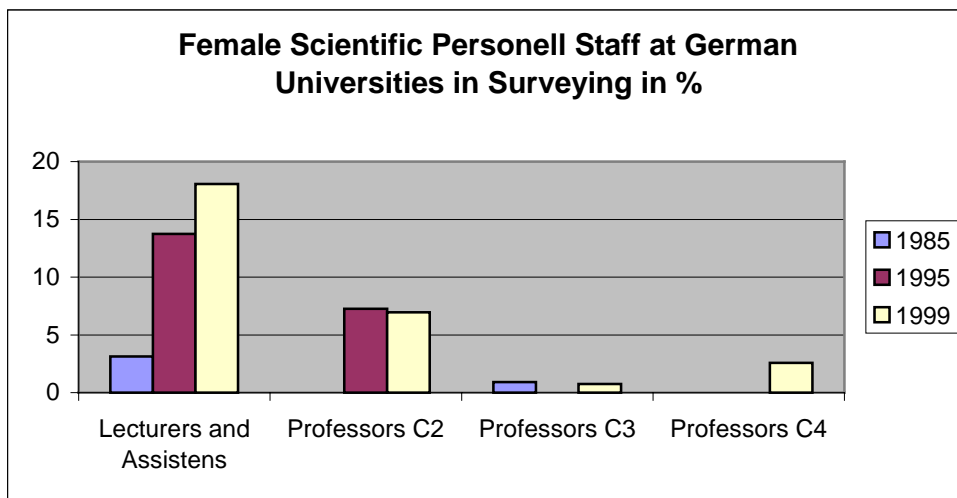
The study at universities of applied science is more practical orientated and shorter. On the other hand this degree is combined mostly with a lower salary and status. The study at universities is research-orientated and significant longer, and with this degree it is normally possible to start the career already in management positions.

Over the last few years the number of women in surveying studies has been increasing, but it is still alarmingly low, especially in the scientific personnel staff. In 1999 the percentage of female students, who took a diploma was 30 % at universities with an increasing percentage of 8 percent the last 4 years and 31 % at universities of applied science with a stagnating percentage. The studies at universities of applied science seemed to appeal to female students, but this is changing now.



Data: Statistisches Bundesamt 1987, 1997, 1999

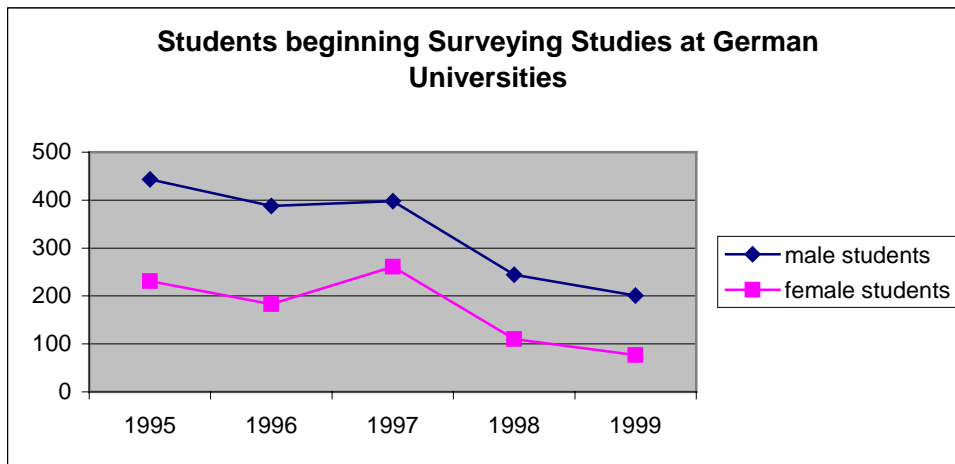
It has to be taken into account, that in the German Democratic Republic (GDR) as a result of better basic conditions the number of women in surveying was higher. After the reunification of Germany therefor the percentage increased.



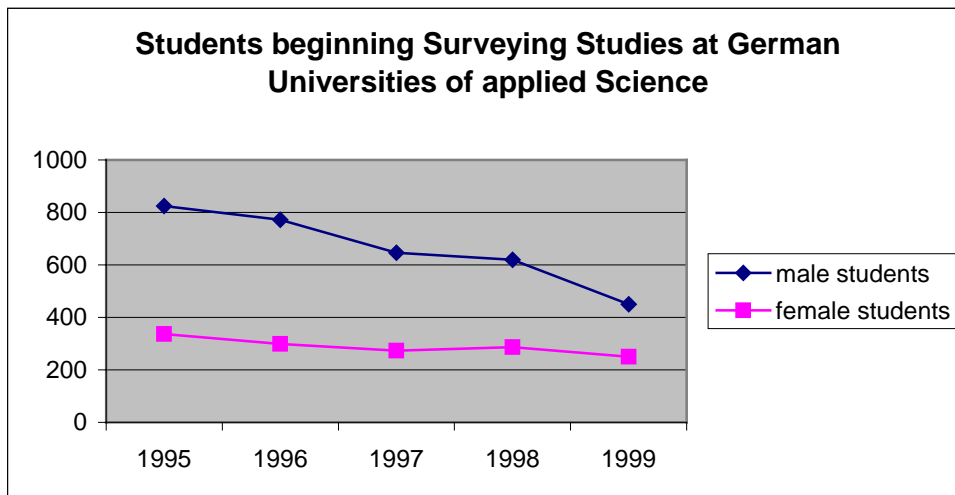
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## 2. STUDENTS BEGINNING SURVEYING STUDIES

The number of students beginning surveying studies at universities decreased from 674 in 1995 to 278 in 1999 and at universities of applied science from 1160 in 1995 to 700 in 1999. There has always been a cycle of increasing and decreasing numbers of students, but universities are more and more forced to give an account of the used resources and the achieved results. It seems to be remarkable that the number of female students beginning at universities of applied science doesn't decline in that way it does at universities or it does with the numbers of male students.



Data: Statistisches Bundesamt 1997 - 2001



Data: Statistisches Bundesamt 1997 - 2001

### 3. NECESSITY TO REFORM THE STUDY

The necessity to reform studies in the engineering field has been discussed since several years. Employers are asking for a new type of engineer with better non-technical and interdisciplinary qualifications instead of pure technical knowledge. Till now less women than men in Germany are interested in the surveying profession, which depends to a great extent on the image of the profession and the content of the study. A lack of teaching contents and teaching methods considering key-qualifications lead to a lack of female students (Kosuch 1998).

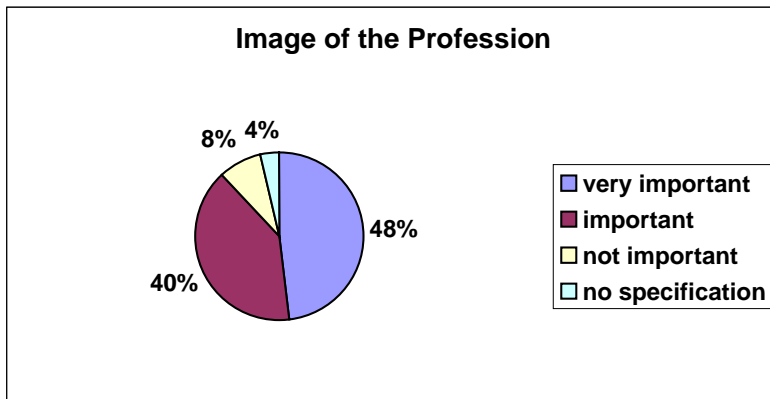
### 4. RESULTS OF A QUESTIONNAIRE

The Working Group “Women in Surveying” of the German Association DVW has been dealing for several years with the situation of women at universities and universities of applied science. To underline the necessity of study reforms the Working Group distributed in 1998 a questionnaire concerning the situation at universities and universities of applied science during the national Congress INTERGEO in Wiesbaden.

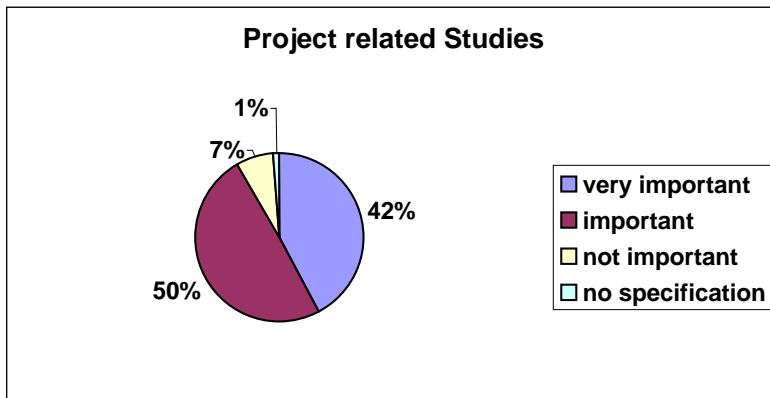
Women were asked

**“Which Changes do we need, to attract more Women to study Surveying?”**

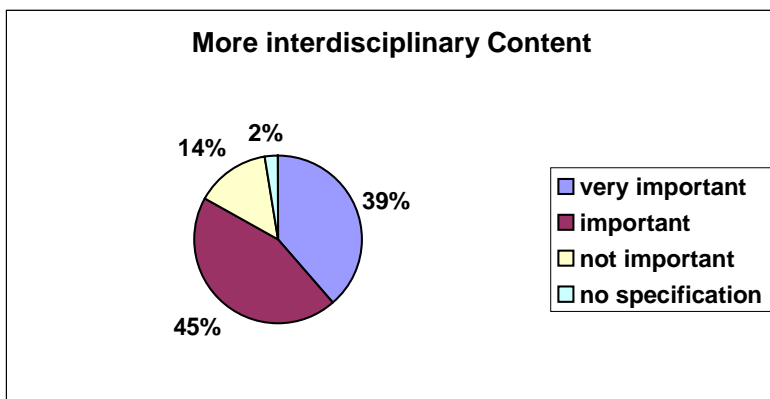
83 questionnaires were completed. The results were as follows:



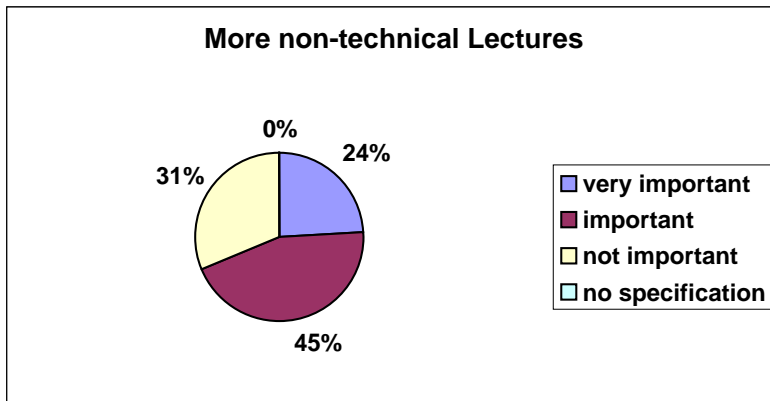
The image of the profession seems to be the most important point for the decision against or for surveying. Up to now the surveying profession is understood as a job with rubber boots and picket. The new task areas couldn't be procured. Some universities and universities of applied science changed from surveying to geomatic, geoinformatic or geoinformation. But this diversity now didn't lead to any clarification and didn't meet the content of the study (Kohlstock 2000).



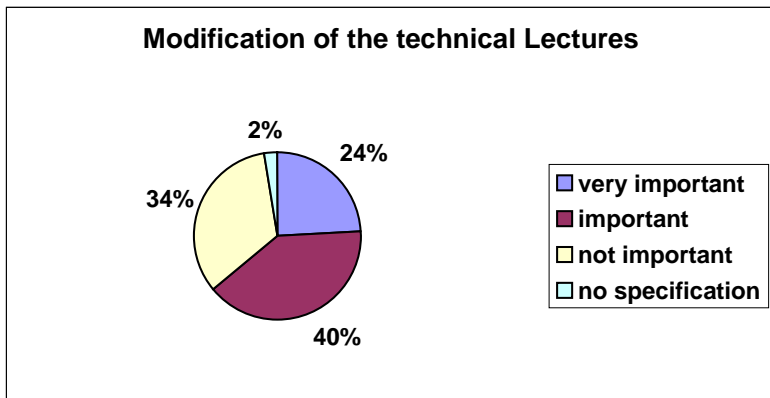
Women ask for a change in the teaching methods. The task to solve problems should get the preferences instead of a traditional additive study-cast. In profession nowadays it is more important to realise and understand networked processes and its modelling such as learning of principles than to get detailed special knowledge (Kohlstock 2000).



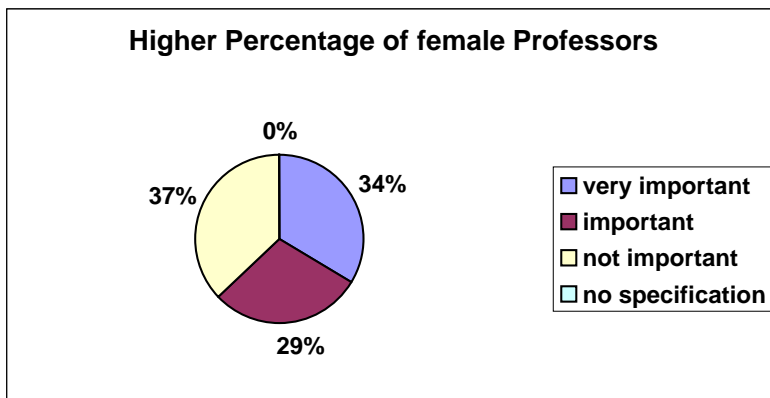
More women than men demand that technology is placed in a context, relating it to effects on society, humans and on the environment. Also the curriculum should provide a holistic view rather than a fragmented view on technology (Ullenius 1994).



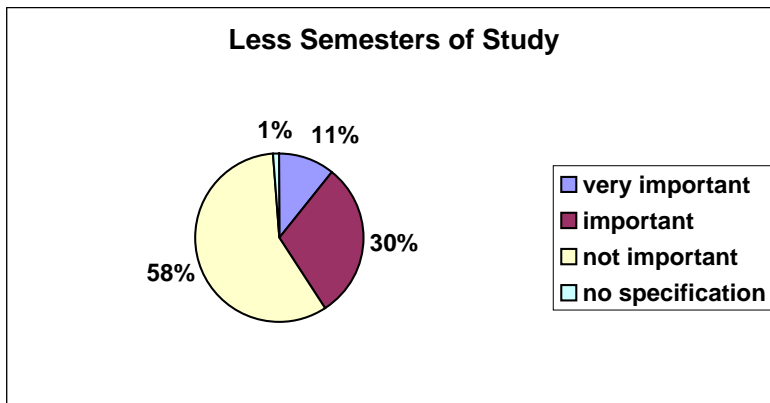
The training contents and objectives do not appeal to women with interdisciplinary, social and linguistic interests (Wissenschaftliches Sekretariat, 2000).



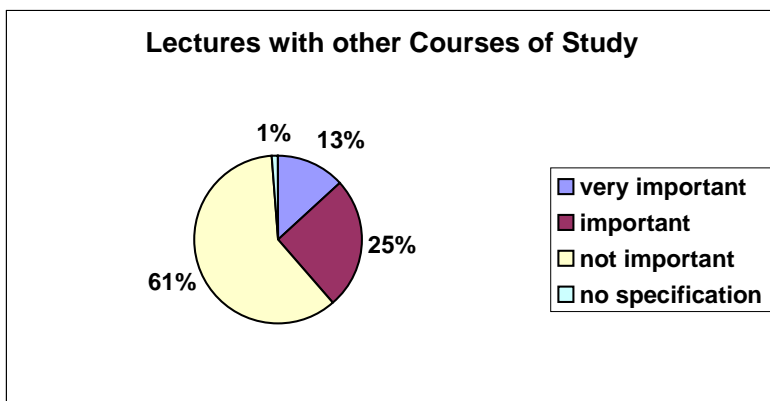
Technical lectures have to adapt faster and better to the professional needs. This appeals not so easy in view of the fact that the average age of professors of some universities and universities of applied science is very high. Teaching processes have to implement qualifications which are held for timeless (Kohlstock, 2000).



A higher percentage of female professors may attract women to choose a scientific career. But it seems not so much important than other objectives to choose the study of surveying.



The opinion that more women study at universities of applied science because the study is shorter than at universities seems not to be confirmed.



Lectures with other courses of study seem not to be so important because the decision for a technical profession has already been taken.

## 5. PROPOSALS FOR CHANGES TO THE CURRICULA

To interest women in surveying studies it is necessary to change the contents, the teaching process and the culture of the engineering education. One of the main hypotheses is that women demand that technology is placed in a context, relating it to effects on society, humans and on the environment. Also the curriculum should provide a holistic view rather than a fragmented view on technology. More flexibility in the programs, humanities and social sciences as optional courses, team work, student oriented rather than teacher oriented learning environments are remedies that are suggested (Ullenius 1994). Common reform movements have to take into account gender to improve the situation of female students.

This should be developed by German education systems in response to the changing educational and professional needs of the society.

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## BIOGRAPHICAL NOTE

**Gabriele Dasse** (40), is chair of the FIG Task Force on "Under-represented Groups in Surveying" since February 1998 and member of the Task Force "Review of Commission, Task Force and Permanent Institution Structure 2000–2002". She studied surveying in Germany at the University of Applied Science in Hamburg with the main emphasis on Photogrammetry. After practising one year in a private company she started working for the Department for Geoinformation and Surveying in Hamburg. At the moment she is responsible for regulations and instructions.

From 1991 to 1996 she held the office as equal right representative for the entire authority (both jobs 50 % part time) of 1600 employees with a share of 25 % women. As one result of her activities Gabriele was nominated by the Green Party and elected as member of the Hamburg Parliament from 1993 to 1997. She was the speaker of women's affairs of the parliamentary party.

Since 1990 Gabriele Dasse has been member of the working group "Women in Surveying" in the German association DVW (member of FIG) and since 1995 speaker of this group. Gabriele Dasse has been member of Commission 1 (Professional Practice, Organisation and Legal Basis) of DVW since 1998.