

„Teens Tackle Technology“- Illustration and critical reflection of a project at the Graz University of Technology

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Abstract

“Teens Tackle Technology“ is a project at the Graz University of Technology focusing on female students aged 16 to 18. A one month internship at different departments of the Graz University of Technology is offered to allow these students to gain an insight into the daily routine of technical researchers and give them the opportunity to engage in research work and the preparation of courses. Mentoring by a member of the research staff, of preference female, is a crucial component of this program. Female mentors are favoured, as they serve as role models in everyday life as well.

Our paper will focus on the qualitative evaluation of the project, which we have performed in the framework of “FEMTEC Styria”. Our analysis of this project is based on an internet research, literature study, quantitative evaluation and an expert interview with the project leader as well as interviews with female mentors and former trainees.

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1. Introduction

“Girls in technology?” Asking such a question implies that technology is for men only. It also shows that prejudices against girls planning a career in a technological domain prevail. In the majority of cases the proportion of female students enrolled in technical subjects is still far below 50%. This gender specific inequality does not root at university level, but also the process of socialization, media coverage and gender specific treatment in schools contributes to the underrepresentation of women in technological fields (Wächter 1993).

The project leader Johanna Klostermann emphasizes that the project “Teens Tackle Technology” should contribute to lifting entry barriers and prejudices concerning technology. Young women get the possibility to experience “hands-on” the daily research routine (Klostermann 2007). This paper describes the project “Teens Tackle Technology” critically and in detail. Based on excerpts of our interviews with the project leader, who kindly shared her expertise, interviews with former interns and mentors, we discuss the possible effects and outcomes of the project.

Germany can already look back on a longer tradition in hands-on approaches in career orientation. In 1992 a first program titled “Sommerhochschule” (Summer School) was organized at the technical department of the University of Duisburg (Kosuch 2000). This Summer School program and the project “Teens Tackle Technology” share a common goal: Both aim at attracting and reinforcing the interest of young women to technical professions and studies (Kosuch 2004).

The significance of such a project in the Austrian context is incontestable. Statistics show that in almost all technical studies the number of women is smaller than the number of men. To give proof of the importance of this project facts and figures describing the number of professors and students at the Graz University of Technology will be provided.

2. Situation at the Graz University of Technology

In the winter semester 2007 / 2008 the proportion of female students was around 20 percent. The number of female students enrolling for the first time was at about 27 percent. Looking at this chart, which shows the proportion of female students enrolling at Graz University of Technology from 2002 to 2008, we can clearly see a remarkable increase. (Fig. 1)

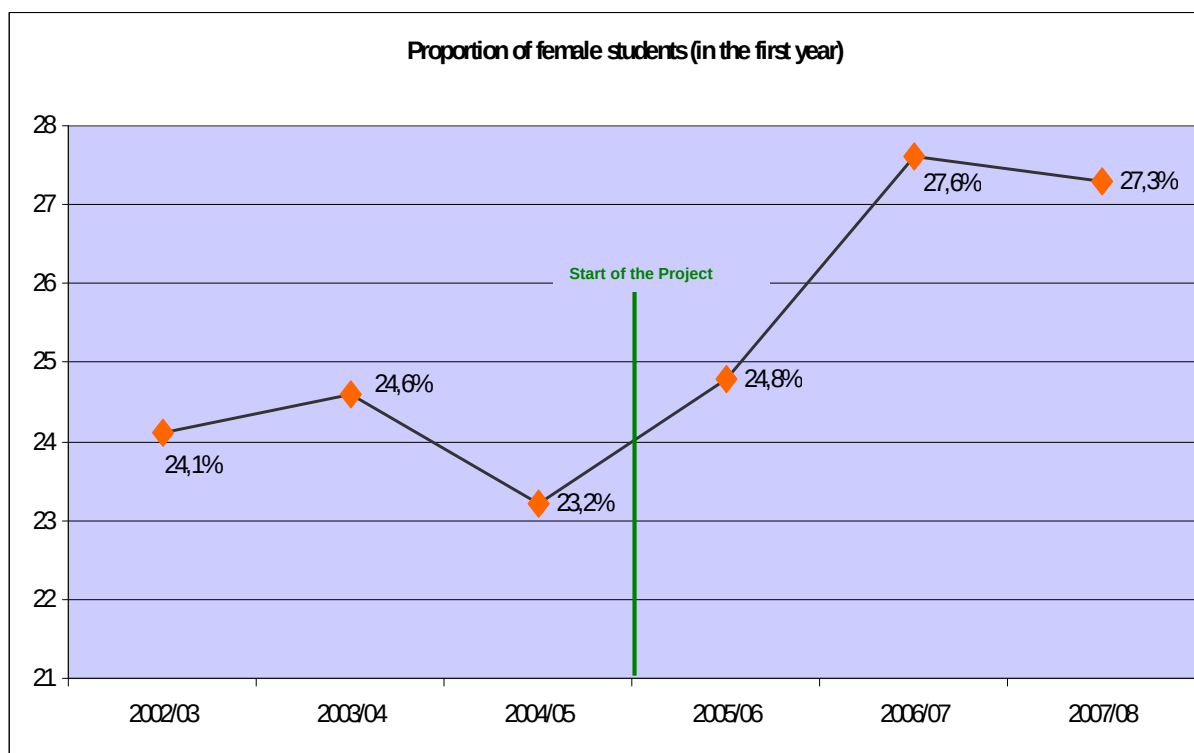


Figure 1: Proportion of female students (in the first year), (Büro des Rektorates 2008, 15)

In only four fields of study the proportion of female students was above 40 percent. These were: Biosciences (66, 8%), Chemistry and Technical Chemistry (46,9%), Architecture (41,5%) and Technical Chemistry. From about 20 fields of study nine have a proportion of female students lower than 15% (Büro des Rektorates 2008, 18).. But also the personnel structure is characterized by this trend of underrepresentation of women. (Fig. 2)

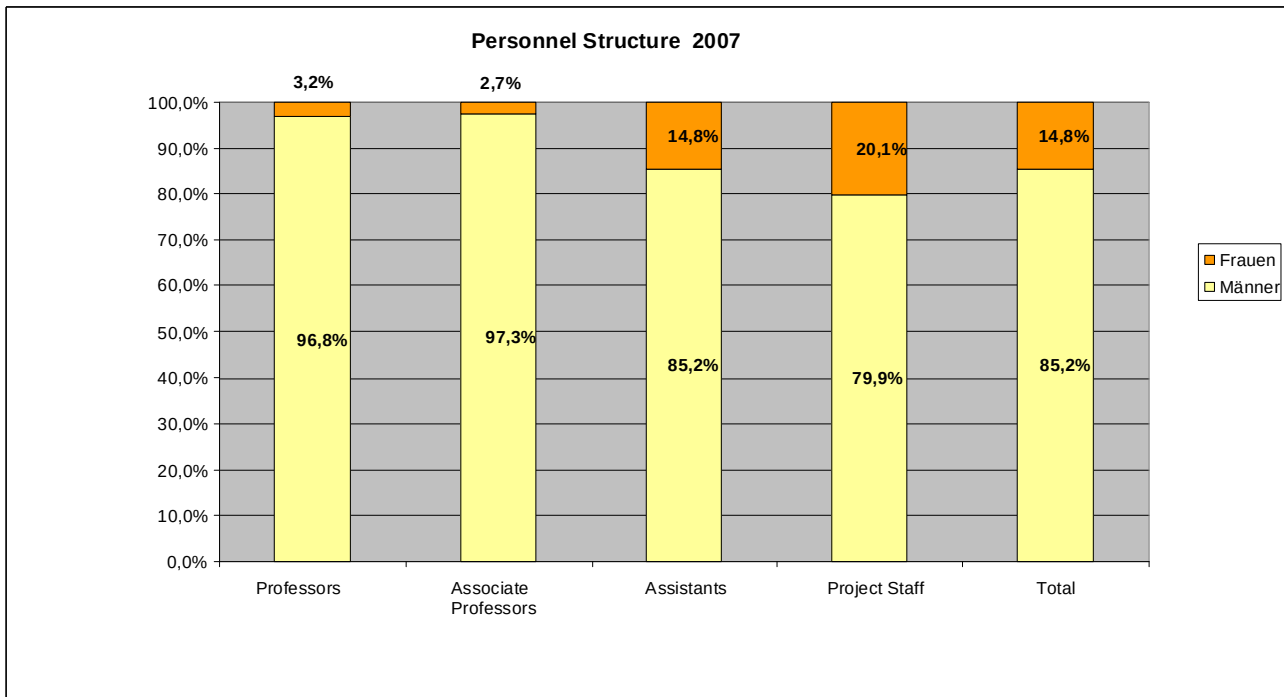


Figure 2: Personell Structure 2007, (Büro des Rektorates 2007, 24)

This graph is best interpreted in one sentence: The lower you look on the hierarchical level the higher the proportion of women. Or put the other way round: the higher you climb the hierarchical ladder the fewer women you meet.

3. Project “Teens Tackle Technology”

The project “Teens Tackle Technology” emerged in 2004 in cooperation with the vice-rectorate for academics at the Graz University of Technology when a quality profile was created for the university. With the chief aim to give female students not only information, but also an insight into the daily routine of technical researchers the office for gender equality and affirmative action, under the direction of Johanna Klostermann, decided to put the project “Teens Tackle Technology” into practice. It is widely known that teenagers enjoy traineeships, therefore in the summer of 2005, internships for 41 female students were organized. One year later, in 2006, already 98 internship places were made available and in

2007 more than one hundred teenagers applied as an intern, of which 88 female students were approved of.

To obtain an internship the teenagers have to fill out an application form. As a second step they are interviewed by Johanna Klostermann. This procedure should help to detect particular interests of the students and facilitate the allocation to an adequate department. The trainees and the staff of the departments meet before the internship starts to get to know each other and discuss open questions and the further procedure. The internship takes four weeks and is offered in the summer holidays, in July and August. The trainees work 25 hours per week at the departments and are paid about 500€. The girls get the chance to repeat the internship the following year and if they realise that their interests lie somewhere else, to choose a different department.

3.1. Target group

In the realm of the project “Teens Tackle Technology” students aged 16 to 18 have the opportunity to get an insight into the daily life at the Technical University of Graz. As already mentioned in the introduction, socialization can be identified as one of the major processes responsible for the underrepresentation of women in technology.

In the process of socialization people are formed to “social individuals” who, by gaining experiences in predefined life situations, develop strategies for actions. Every experience gathered in a lifetime has the power to form the way we think and perceive things. In this process we also form our identity. It is important to point out that gender specific socialization provides girls and boys with differing starting situations for the formation of their identity (Bilden 2000). Divers empirical studies show that parents encourage their children to behave according to socially allotted gender roles. While boys are usually encouraged to play with cars or outside, the girls’ attention is directed towards dolls and housework (Hannover & Bettge 1993).

Children use simple rules and stereotypes to construct their worldviews. Stereotypes are fixed ideas of behavior patterns or characteristics considered to represent a certain type of individuals and are acquired in the process of socialization (Regnet 1997). Gender stereotypes can be described as cognitive structures and socially shared knowledge describing the specific characteristics of women and men (Eckes 2004). These schemata or rules of action influence the way individuals perceive the world and their behavior, they also help individuals to interpret reality and are also used by adults (Wender 2000).

Children do not have the capabilities to overcome these schemata. Only when reaching adolescence new differentiated perceptions and attitudes can be developed (Bilden 2000).

However, young people as well often behave according to gender typical norms to show that they are already adults and know how men and women are supposed to behave (Hannover & Bettge 1993).

The way girls and boys in school experience every day school life also contributes to gender specific perceptions of technology. The sociologist Jansen-Schulz (1993) argues that the school, being part of the societal structure and a socializing institution, mirrors societal orientations. Boys have the tendency to evaluate their skills and qualities rather positively, whereas girls tend to underrate their own capabilities. Boys attribute their successes at school to internal and stable factors like their talent. Girls, on the contrary, allude to external and unstable factors, like luck or individual effort, to explain good results at school (Küllchen 1997). Thus, boys' self-confidence is more stable than that of girls. In addition to that girls and boys are supported and treated differently in class. People attribute boys with higher competences in science and technical subjects and they are encouraged to make hands-on experiences while girls are supposed to assist. On top of that boys often deny girls competence in technical and mathematical subjects (Jansen-Schulz 1993). Hannover and Bettge (1993) have noticed that girls experience science and technology negatively because they seldom gather positive experiences in these fields.

A further cause for the underrepresentation of women in technology can be found in the differing experiences in every day life of girls and boys. On an every day basis girls deal with technical matters not as often as boys and thus they lack first contacts and initiating experiences with technology (Jansen-Schulz 1993).

3.2. Quantitative evaluation

The quantitative Evaluation has been carried out by the department of human resource development at the Graz University of Technology. This evaluation should help us find out whether students liked the traineeship or not. Unfortunately the return rate for all three years taken together is just about 41%. Therefore the value of this analysis is a little limited.

The results of the returned questionnaires are as follows:

98% of the students liked the traineeship. 57% of female trainees say that their interest for professions in the natural sciences and technologies has increased due to the internship. In spite of the low return rate the proportion of students who can imagine to enrol at Graz University of Technology is encouraging. 61% of the students who answered the questionnaire consider studying at Graz University of Technology.

4. Methods

In the framework of “FEMTEC Styria” we got the chance to evaluate the project and write an article about our analysis. To become acquainted with the project itself we started with an internet research and an analysis of documents describing “Teens Tackle Technology”. To get a deeper insight into the project we interviewed the project leader Johanna Klostermann. As we were interested in a comprehensive qualitative analysis we decided, in addition to this first expert interview and the quantitative evaluation, to interview two female mentors and three female students enrolled at Graz University of Technology. All three had completed the four week internship at some point.

5. Results

The presentation of our results will be split in three: first we write about the transition period from „school to university” then about everyday life, the daily routine at the traineeship and finally we discuss the role of female mentors.

5.1. Transition period – from school to university

The transition period from school to university or to any other form of further qualification is crucial for the development of the personality of young women and men. Students are confronted with a world they are unacquainted with. They have to change their habits and adapt their action strategies. A reorientation takes place considering the choice of further education made by the young person (Küllchen 1997). In this period the differences in attributing successes to internal (typically men) or external (typically women) factors, as described above, is of particular importance. Küllchen cites Rustemeyer (1988) who gives advice on how to restructure gender specific self-perceptions. Only when women gather lots of positive experiences a cognitive restructuring takes place. Thus, positive experiences gained in the context of an internship can contribute to a new self-perception. It might contribute to young women attributing their successes to themselves, to internal, stable factors as for example their skills and not to external factors as for example luck (Küllchen 1997).

Traineeships can be seen as first contacts with the working environment. They are also helpful in decision-making processes when it comes to choosing a career-path or a field of study. Therefore the traineeship is a good preparation for future decisions in careers of young people (Küllchen 1997). Another advantage of this hands-on approach is that during the internship young people experience technology very positively. Studies have shown that teenagers who have gathered practical experiences in technical fields have a more positive attitude towards technology studies and the natural sciences than teenagers who have no such experience (Hannover & Bettge 1993). If the traineeship meets the student's

expectations it has the strongest effect on later career decisions (Küllchen 1997). In the project “Teens tackle Technology” the organisers consider this fact and they try to meet the wishes and preferences of the students involved.

5.2. Everyday life

The four-week practical course offers the students the possibility to get a deeper insight into the scientific world. The young women become involved in the daily routine of the department they work in. So in the end they understand more fully what people really do at technical universities and they get a more realistic occupational image (Wächter 2003).

Some examples for the work the students do are: preparing the courses, doing laboratory work and some other research activities. A research assistant told us, that she thinks that the project is a good opportunity for the trainees, because they get an insight into the daily routine at the departments, which students generally lack.

5.3. Mentoring

An important component of the practical course is the supervision by members of the academic staff, of preference female. For the students it is very important to have a female contact person they can talk to. These women serve as role models and often influence the later career choice. Role models are often missing in everyday life (Bilden 2000).

We asked one of our female interview partners if she thinks she is a role model. In her statements she confirmed that she perceived herself as a role model not only for trainees but also for female students. She describes mentoring as one of her main tasks in her professional position. In her eyes it is very important to motivate young women at a young age, when they still go to school.

Especially when it comes to gender roles, teenagers could broaden their perception by meeting people who have other ideas and expectations in terms of the gender ratio. By the new experiences gathered in the course of the traineeship the traditional understanding of gender roles could be changed or at least put into perspective (Bilden 2000).

6. Résumé

Traineeships can be perceived as a first contact with a future learning and working environment. They are also often crucial in the process of occupational orientation and the choice of studies (Küllchen 1997). In the project the organizers facilitate the students the entry to the University of Technology and try to communicate positive experiences when it

comes to technology studies. And maybe the idea that women work in the labs and offices of the Graz University of Technology will be more common in future.

A problem of the project is that it uses the deficit approach. This means that they assume that gender-related knowledge exists and that the needs of girls and boys differ from each other (Pritchard Hughes 1995). The deficit approach points out differences between the sexes and highlights special skills, experiences and features of women as explicit “female” traits (Jarosch 2003). Nevertheless positive experiences with technology are gathered during the traineeship and it is essential for a good preparation and also as a guideline for the choice of studies. Therefore the project is a good practice example, which can be seen as helpful to increase the number of female students at the Graz University of Technology and, if adapted to the situational circumstances, at universities of technology in general.

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