

# Spirit

## University of Stuttgart's Life-Cycle-Based Gender-Mainstreaming-Concept

Barbara Burr<sup>1</sup>, Peter Göhner<sup>2</sup>,  
Wolfram Ressel<sup>3</sup>, Wolfgang Schlicht<sup>4</sup>

<sup>1</sup>Center for Information Technologies,

<sup>2</sup>Institute of Industrial Automation & Software Engineering,

<sup>3</sup>Department of Civil and Environmental Engineering,

<sup>4</sup>Department of Sport and Exercise Science

University of Stuttgart, Stuttgart, Germany

[barbara.burr@rus.uni-stuttgart.de](mailto:barbara.burr@rus.uni-stuttgart.de)

Sabina Jeschke

Center for Learning and Knowledge Management &  
Institute of Information Management in Mechanical

Engineering

Faculty of Mechanical Engineering

RWTH Aachen University

Aachen, Germany

[sabina.jeschke@zlw-ima.rwth-aachen.de](mailto:sabina.jeschke@zlw-ima.rwth-aachen.de)

**Abstract— In spite of social and political efforts to achieve equal opportunities, women remain a minority in natural sciences, technical and related fields. We hereby present the gender concept of the University of Stuttgart. First, the steps for promotion of female students within natural sciences and technical fields are developed.**

**Keywords—gender concept, female academic education, diversity studies, women in natural sciences and engineering**

### I. INTRODUCTION

Despite comprehensive social changes and political efforts to achieve equal opportunities, women remain a minority in the natural sciences, technical study fields and the corresponding occupational fields. This paper presents the complete gender concept of the University of Stuttgart. First, the steps for promotion of female students and women within the natural science and technical fields have to be developed. Female underrepresentation in science and the demand for equality of the sexes have become a vital aspect of the ongoing reform discussions. A special look should be taken at the education-economic perspective, as well as the aspect of quality assurance and the capability to be innovative [1, 2]: –

- The underrepresentation of women in scientific and technological fields has implications on design, quality and diversity of products. In fact, creative innovations cannot be “all-inclusive” without the inspiration of women: products might be designed faulty because their usage options were only viewed under considerations based on requirements of special groups (e.g., airbags, artificial heart valves, voice recognition systems [3]).
- The absence of women from certain technological fields poses a hard challenge for industry and economy: the demand of qualified specialists cannot be satisfied by men willing to pursue an academic education [4]. The existing loss of interest by men in technical and engineering subjects intensifies the challenge [5]. Moreover, demographic development in Germany and global competition only augment these challenges.
- Technical disciplines graduates are filling important jobs in our society, which are characterized by fields of

responsibility and extensive influence. Technical authorities are a key factor for the shaping of our society [6]. The underrepresentation of women in these fields is a major drawback to equal participation efforts.

Indeed, there are numerous single initiatives aimed at “breaking down the gender-gap” in German universities, each engaged either by different single persons, offices for equal opportunity, as well as individual professors, centres, or initiatives in single institutes. Due to the lack of a comprehensive strategy, such efforts often lose consistency, continuity and transparency, which often leads to a “twofer” for some target groups, while other arrangements and initiatives are missing. Communication and information campaigns aimed at reaching a broad group, creating a common understanding of the challenges and requirements are an exception. Universities should coordinate existing and successful measures in order to achieve better results, aiming for a stronger gender master plan.,

- that comprises the full life-cycle from kindergarten to professorship with leadership function,
- with single steps that aim to make a seamless, coordinated transition between different measures possible,
- that incorporates all areas (education, research and organization)
- and that includes a concept of family-friendly policies for all members of the university.

The female professor program is a characteristic component of the gender master plan of the University of Stuttgart.

The underrepresentation of women in technological fields becomes particularly visible in predominantly scientifically and technologically aligned universities like the University of Stuttgart, where a large percentage of future scientists and engineers are trained. These universities are in charge to overcome the gender gap in the technological disciplines, justifying a broad and early commitment to gender management. Additionally, women are nominated as top position holders of technical disciplines in order to increase diversity in research and education presenting female role models to new generations.

## II. SITUATION-(DEFICIT-) ANALYSIS

Girls and women are still underrepresented in technology-oriented programs. The University of Stuttgart is well aware of these challenges, being a long term driving force to raise the percentage of females. The structure and development plan SEPUS of the University of Stuttgart defines measures; each of them successfully proven. However, the University of Stuttgart neglects a master plan that connects all measures and sustainable networks that build on and support each other. The concept presented here pursues the goal of integration and sustainability of measures. The University of Stuttgart is a fully profiled university oriented towards technological and scientific programs, and the concept of equal opportunity is aligned with this profile. Therefore, the focus is on the recruitment of women into technical disciplines. They are initially acquired for scientific and technical degrees, then promoted, depending on their talents, and supported on their "job ladder" inside or outside the university. The objective is to boost the percentage of female students in scientific and technical disciplines from currently 20% to 30% (within the entire university from 34% to 40%) and the rate of young female scientists from 18% to 30% (within the entire university from 21% to 30%). The target in these disciplines is set for an increase of female professors from 6% to 10% (same within the entire university) within the next five years. Furthermore, 30% of the professorships have to be newly appointed until 2012. Therefore, a considerable increase is possible.

Baden-Württemberg is striving for a long term increase of the quota of female professors to 30% (defined by the head of the Office of Scientific and Technological Affairs, Franckenberg).

## III. OBJECTIVES CONCERNING DIFFERENT TARGET GROUPS

Chapter IV.A describes the different measures to be implemented within the framework of the gender master plan of the University of Stuttgart in detail. This chapter summarizes the most important foci from the catalogue of measures concerning addressing the different target groups:

- Increase percentage of women in top scientific positions

The incompatibility of a scientific career and family is still a major reason for women to distance themselves from the former. To address this challenge, the University of Stuttgart is working towards improving the surrounding circumstance to unite a scientific career with family life. The intention of sufficient child care offers, a family friendly housing situation, the adjustment of study and examination regulations and development of alternative work schedules are supporting this goal. Another important point considering the encouragement of women in leading scientific positions is the inclusion of the career planning of their partners (Dual Career).

The University of Stuttgart is aiming to increase the ratio of female professors to 10% according to their structure and development plan. To create the long-term framework for this goal, the University of Stuttgart is developing a package of measures. Especially qualified female students and young female scientists are provided with individual sponsorship and a structural framework to improve the compatibility of

scientific career and family. The financial support through scholarships is seen as of similar importance as the personal support through formal and casual networks and the acquisition of career-furthering qualifications. Versatile cooperation with regional companies put the University of Stuttgart in the unique position to offer attractive choices within the industry and economy to partners of female researchers.

- Career and personal development for young female scientists

The next important point is the phase between academic studies and the beginning of a scientific career: that is the point where future scientists should be made aware of the existing career options in order to begin to develop their career-strategies. They need to gain access to networks and acquire leadership and management qualifications. Community building between students and young scientists is fostered by employing comprehensive measures within the single institutes and creating positive role model, initiating a regular exchange of experience between successful young scientists and female entrepreneurs.

In order to raise female students and young scientists, it is important to create a supportive living environment and to present attractive employment opportunities to their partners, in short, offering Dual Career Options as early as the qualification phase. To achieve this goal the University of Stuttgart has set out to earn the certificate of "family friendly university" awarded by the Hertie-Trust.

- Acquisition of female students in the natural sciences and technological disciplines

A central condition is the awakening of enthusiasm for natural sciences and technology to foster the election of a scientific or technologically oriented field of study later in life. The University of Stuttgart has build a package of measures that incorporates the education of teaching staff, as well as considering research of gender sensitive deployment of toys and the creation of an academy for younger children. Furthermore, the University is compiling effective public programs - female students are given an age-based understanding of natural and technical questions. It is for such purposes, that existing programs like the Girl's Day have been expanded and new choices like the Technology-Camp were developed. Female students can use their vacation time to research exciting scientific and technological topics.

In order to help a girl on the decision of choosing a technological or scientific program of studies there is the offer of a trial course, as well as a program to support them from the last year of high school to the first semester at the university. In addition to the program "Try the University", girls in the last year of high school are being offered the full curriculum of available bachelor degrees and are enabled to collect credits towards their future studies.

## IV. IMPLEMENTATION OF THE CONCEPT SPIRIT

The concept is following a life-cycle model. The target groups are girls and women which are accompanied from kindergarten to professorship by multifaceted package of

programs: The single activities are weighted differently depending on the phase of life, build on each other and are interlocked. This ensures that measures exist for each state of the life cycle that aim towards a goal and support the progress towards the next phase. Special weight will be put on the systematic advancement of female migrants due to the fact that their requirements are defined by a different process of socialization compared to women without a migration background.

A. Measures for Each Scope of the Life-Cycle:

1. Gender Sensitivity Training Courses for Educators

Measures have to be taken already in kindergarten to ensure the best possible equal upbringing of girls and boys. Sparking children’s interest in natural and technical questions requires careful planning of all educational activities. To improve this concept the University of Stuttgart designs, prepares and implements gender- and diversity- sensitive scientific and technical professional training for educators. Evaluation and counseling is provided by the Institute for Social Sciences.

2. TechToy

Gender and diversity sensitive engineering toys that are accepted and appreciated by both sexes are necessary to awaken the enthusiasm for the natural sciences and engineering early and across both genders. The University of Stuttgart plans to apply a main research focus on the development of gender sensitive engineering toys. A co-operation of different chairs of engineering, the Institute of educational science and psychology, and the institutes for social sciences, technology and environmental sociology [7] will carry this research focus. This concept is built on the preparations for the initiative “Wissensfabrik” (knowledge factory). The University of Stuttgart will soon join this initiative - one of the first universities to do so. A pedagogic concept is being developed to allow for a meaningful use of the toys in pre-schools, schools and families. Such a concept could look similar to – the extremely successful – Roberta- teaching materials of the Fraunhofer IAIS for LEGO Mindstorms robot building (a Roberta Regional Centre is currently being build up and developed at the Institute for IT Service Technologies).

3. Exhibition Team University of Stuttgart (ETUS)

The University of Stuttgart build a professional team that will focus on public relations with specific target groups. The field of responsibility for this team also includes the development of effective publicity programs for events at the University of Stuttgart including the Day of Science (“Children’s-Campus – Program for young researchers”), as well as Technology exhibitions like the “Land of Ideas” or the “Cebit”. During this process, programs will be prepared to fit the different target groups of preschool age, elementary school, junior high school, secondary school age, and for teachers. This project can build on the experience of the Student Counseling Centre and of the marketing office.

4. Rent-a-Scientist & SchoolgirlUni

This is a project in which pre-schools and schools are offered possibilities to “rent” (female) professors or (female) research staff of the University of Stuttgart. They visit the educational institution and answer questions from the fields of science and engineering with age group specific lectures and demonstrations. In reverse, the University of Stuttgart offers (female) students the possibility to come to the university to get to know it “from the inside” (student/schoolgirlUni). To ensure the success of such events a pedagogical concept is drawn up and staff members are trained (pedagogical mentoring by the Institute of educational sciences and psychology). The concept also addresses culture-based conflicts of interests – especially relevant for pre-schools and schools with a high ratio of children from migrant families. The measures 4–6 and 8–10 are part of the University of Stuttgart Young Academy which is currently being implemented.

5. Girls’ Day

The University of Stuttgart has been participating in the mono educational Girls’ Day for several years. Girls are invited to the university to have a look at the different scientific and technical areas. Specialized subjects from different departments are being prepared to spark the girls’ interest. In this regard the girls have the possibility to try the experiments also on their own. The program will be further developed in the coming years and expanded inside of the university through the integration of more faculties and considering culture-specific differences in interests and approaches.

6. Partner Schools

Direct connections to partner high schools improve the cooperation between schools and universities. Common activities give female students a chance to gain some early insights into research and education at the universities. Such measures may help to facilitate the transition from high school to university, as well as the choice of a course. They should further benefit from the close cooperation with the successful “Mine-Mint”-Network. The continuing initiatives involving the Institute for Hydraulic Engineering, the Department of Physics, the Department of Chemistry, as well as the Department of Computer Science, Electrical Engineering and Information Technology and the freshly initiated cooperation with the “Landesgymnasium für Hochbegabte in Schwäbisch-Gmünd” shall be continued and further expanded.

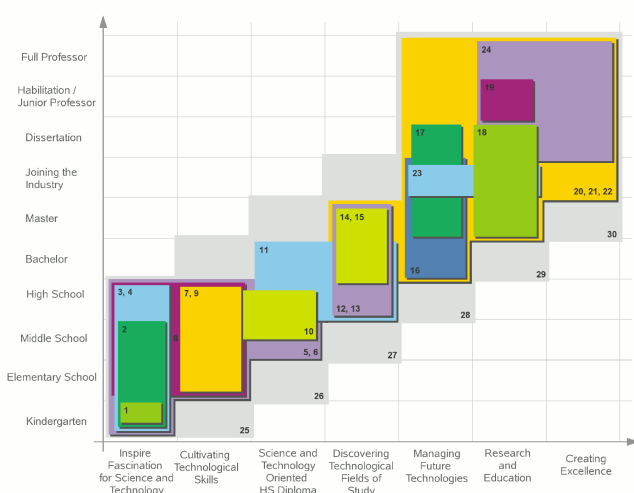


Figure 1. Life-cycles from kindergarten to professorship

### 7. *Gender Sensitivity Training for Teachers*

This training course is designed to enhance the skills of teachers in gender and diversity sensitive didactics for teaching technological or scientific courses. As the result of both formal and family education, girls are interested in different questions than boys. The course develops guidelines based on concrete examples to help teachers create a sense of fascination and adventure concerning science and technology in students. These courses are supported by the competency of the Institute for Social Sciences. The University of Stuttgart takes advantage of the unique situation created by the restructuring and modularization of the academic education of teachers in Baden-Württemberg to enhance the competencies of teachers in training for gender sensitivity. Current plans allot 6 credit points for this field.

### 8. *Technology-Camps*

Technically-oriented summer camps teach modern science in a hands-on approach. These “Technology Camps” present selected current topics from the fields of research and education at the University of Stuttgart in high school level lectures and experimental labs. High school and university students research interesting topics from the natural and engineering sciences in close cooperation with professors. These summer camps expand upon the already existing summer break programs offered by the University of Stuttgart (Stuttgarter Forschungsferien). The university can build on experiences gathered in the (Nanocamp, Faculty for Civil- and Environmental Engineering). Future summer camps will be offered as mono or co-educational. Mono-educational summer camps will make participation easier for female students from families with a migration background. The SPIRIT program plans to offer stipends for students from financially weaker families through the integrated foundation.

### 9. *TechnoClub “Test your University”*

The TechnoClub offers single workshops and one-semester courses for female high school students, held at the university. Lectures and labs held by members of the university are designed to familiarize high school students with the daily life at the university. These courses include a lab for Robo-Rescue and courses for electronics and soldering. Special attention will be given to culture-specific variations in interest and approaches in support of the main focuses 4, 5, and 8. The courses offered in the TechnoClubs are created by a representative cross section of all institutes within the university and are centrally coordinated. This mono-educational concept is based on a long running and successful program, “Try the University” (“Probiert die Uni aus”).

### 10. *Studium Experimentale*

The “Studium Experimentale” presents several different approaches to familiarize students with the University of Stuttgart and the different programs offered. First of all, high school students are offered university level courses in a more compact form, including the final exam. This idea is based on the “SchülerStudium” at the FU Berlin. If a participating student should decide to pursue a compatible course of study at the University of Stuttgart, they will receive priority in the acceptance process and will be credited with the corresponding

credit points. As a result, ties between students and the University of Stuttgart are created early and the transition from high school to university is eased. Secondly, since female students often find it hard to decide on one single technological or scientific course of study, the University of Stuttgart offers one-year courses with access to all available bachelor courses without forcing the student to enroll with any one particular program. The credit earned during this period is fully applicable to any future course of compatible studies. The University of Stuttgart is currently engaged in defining the necessary legal framework (crediting, BAFöG).

### 11. *Mentoring “Transition from High School to University”*

The Campus Mentoring Program matches selected university students with high school students to mentor them at the end of their high school and the beginning (first few semesters) of their university education. The mentors help the students adapt to the daily routine at university. The students will be gradually transferred to an advanced mentoring program supervised by professors as they enter university.

### 12. *Gender Sensitivity in Technologically-Oriented Courses of Study*

Technologically-oriented courses of studies and careers are not unattractive to women per se. However, motivation, specific interests, style and strategies of learning, goals and expectations can differ significantly from those of young men. The University of Stuttgart, under the leadership of the vice rector for academic affairs, will create concepts and guidelines for gender sensitivity in all courses of studies, taking advantage of the opportunity offered by the restructuring of all courses of studies, including their content, to the new, modular bachelor/master system.

### 13. *New Technologically-Oriented Programs*

Quite often female students fail to feel attracted towards the existing curriculum of engineering and natural science programs. The main reasons are that women do not see the social relevance and/or that they are worried whether their interests and talents qualify them to pursue studies in these fields. The Bologna-Process offers a unique opportunity to create new and reorganize existing programs. The University of Stuttgart is planning to implement a number of new programs addressing the specific interests of female students. These programs will build on the experience from the Galilea-Project at the TU-Berlin ([www.galilea.tu-berlin.de](http://www.galilea.tu-berlin.de), already existing cooperation [8–14]. The first two programs are already being designed (Renewable Energy and Medical Technology). The Galilea-Programs are characterized by a high degree of flexibility in the early choice of courses, as well as socially relevant, interdisciplinary foci.

### 14. *Diversity Studies & Technology Management*

It is necessary to understand the role of female engineers and scientists, including their special contributions and unique potential, to attract more women to studies and careers in the technological fields. To address these requirements, the University of Stuttgart is planning to create a program for diversity studies in the engineering sciences with a focus on

technology management. The courses offered in the program will be credited as minors or mandatory elective courses in the engineering, economics, scientific and social studies programs, strengthening the impact of gender and diversity studies in the existing programs.

#### 15. *Program for Stipends: "Opportunity"*

Stipends provide a means for direct promotion of talented students. As such, it is a tool well suited for supporting students from financially weaker families. In addition, they create social networks between the recipients and bring them into contact with prospective employers (often former recipients or even founders of the stipends). The University of Stuttgart plans to create specific stipends for female students of the natural sciences and engineering in close cooperation with successful regional companies and research institutions and with the European Social Fund, ESF. This increase in cooperation will further strengthen the regional economy. The "Opportunity" program complements the existing stipends (stipends for PhD students under the "Landesgraduiertenförderungsgesetz", Schlieben-Lange und Margret von Wrangell Programm).

#### 16. *Femtec Region Stuttgart*

The low ratio of women in positions of leadership within the economy and the resulting perception of a lack of career opportunities has a direct, negative impact on the motivation of female students. The University of Stuttgart is planning to expand the existing cooperation with the successful Femtec program and its associated career building program. Femtec is a unique network of leading technical universities and successful international companies. The University of Stuttgart has been a member of the Femtec network since 2005. The aim of the program is to strengthen the cooperation with the regional economy. The associated career building program teaches leadership qualifications easing the transition to a successful, professional career. The University of Stuttgart is already represented on the advisory board of Femtec.

#### 17. *Entrepreneur Initiative SPIRIT*

Based on the experience gathered in the joint project "Erfolgreich ist weiblich!" (in cooperation with the TTI GmbH, started in February 2007), the University of Stuttgart is creating an informational and consulting offer for students and post graduates, as well as the alumni of the University of Stuttgart who wish to found their own start-up. This network will provide gender specific support within and beyond the boundaries of the university itself.

#### 18. *Mentoring for Women in Science and Research*

In addition to good qualifications and grades it is often the contact and support resulting from access to informal networks that is decisive in professional success. The University of Stuttgart is planning to expand existing and successful mentoring programs for women in science and research to support even more female students in implementing their career strategies. The mentoring program provides support for highly qualified graduates, post graduates and post docs. An additional focus of the program is on qualifying women for leadership positions.

#### 19. *Mentoring Program "ProFiL BW"*

The University of Stuttgart is planning to create a program to support excellence in scientific careers, following the example of the successful elite mentoring program "ProFiL" (<http://www.profil-programm.de/>, existing cooperation) of the three universities in Berlin. Future expansions of the program will include cooperation with other universities in Baden-Württemberg. The (female) participants of this program will receive extensive support in planning and furthering their careers, including training leadership and management skills required of a full professor. Prerequisite for joining this program is an excellent PhD thesis, a one or two-year post doc phase and an interview with the applicants.

#### 20. *"Ladies' Community"*

Female students often feel isolated during their studies due to their low ratio in most engineering programs. Support programs like girls-only exercise courses are faced with a low acceptance as they are perceived as further reaffirming this outsider role. The lack of social infrastructure on-campus will grow even worse in the near future as first semester students are getting younger due to the shortened high school education. This development necessitates a pervasive community building among female students beyond the boundaries of the single study programs. The University of Stuttgart has created a work group to design a concept for realizing such a community. Some measures already planned include regular seminars with successful female entrepreneurs and researchers, regular social gatherings and the creation of a special web portal for the female community. The community to be created should ideally include all female students and alumni of the university.

#### 21. *Colloquium "Women in Leadership Positions"*

Female students are often missing role models, women who have mastered the obstacles and challenges of a program and have reached a leading position in research or business, which results in low motivation and an increase in the drop-out rate. To counter this effect, the University of Stuttgart is planning to hold regular seminars where successful women from research and business share their experience and advice with female students. Future synergies with the "ladies' community" and the alumni program will support this measure.

#### 22. *Family Friendly University*

It is necessary to provide a family and children friendly environment for young families or single students with children to attract more women to study or pursue a career at the university. The University of Stuttgart has already implemented a number of measures to this end. Among these are: child care for the children of students (Kinderbetreuung für Kinder von Studierenden der Universität Stuttgart STUPS e.V., emergency child care, semester break child care) and the Stuttgarter Forschungsferien, an attractive child care program for school kids, organized by the Konzept-e GmbH and five different Fraunhofer institutes.

Going beyond these measures, the University of Stuttgart is aiming at the creation of on-campus dorms with integrated child care for students with children and on-campus housing for young families of employees with comfortable access to nearby child care centres. By getting the students themselves to donate their time to help support the child care centres, we

hope to decrease the financial burden and to help with community building among female students.

Additional important measures should address the specific needs created by the burden of raising children (part time studies, postponed exams due to a child falling ill, virtual courses). Researchers with children will profit mainly from dual career models, family friendly work processes, flexible time, and specific support for researchers during the first years of parenthood and the possibility of working at home. The University of Stuttgart is aiming to be the first university in Baden-Württemberg to gain the certificate as a “family friendly university” awarded by the audit council of the Hertie-Stiftung.

### 23. Re-Entry Program “SPIRIT returns”

The knowledge and skills of many qualified female researchers and engineers is lost to the market due to the massive obstacles when returning to a job after a prolonged absence due to pregnancy and child birth. The University of Stuttgart is searching funding from the ESF based on the BMBF-Program “Wiedereinstieg für Ingenieurinnen leicht gemacht”. Engineers are given additional scientific training to re-qualify them for their re-entry into the job market.

### 24. Dual Career Service Program “DuCaSUS”

As accepting the appointment for a professorship usually involves moving to another city, the career chances of the partner are often a decisive factor in decision making process. A similar situation exists during the post-grad and post-doc studies. Dual Career Services can advance the career chances of researcher couples. Currently, the University of Stuttgart is expanding the dual career supporting policies already common in appointment negotiations to include post-grads and post-docs in the dual career service program “DuCaSUS”. This program will involve the creation of a support network including regional businesses and public and private research companies to offer a larger basis of possible career opportunities for the partners outside the University of Stuttgart itself.

## B. Comprehensive Measures for the whole Life-Cycle:

### 25. Chair for “Diversity Studies & Technology Management”

The Institute of Construction, Production and Vehicle Technology will create a new chair focusing on gender and diversity, based on the example of the “Chair for Gender Studies and Information Technology” at the TU Munich. The main aim is the strengthening and localization of the gender concept of the University of Stuttgart. The academic focus of the chair will be on interdisciplinary courses in the field of gender studies, in particular for the new program “Diversity Studies and Technology Management”, as well as interdisciplinary courses offered to students of other programs at the University of Stuttgart.

### 26. Gender Components in New Appointments

The University of Stuttgart is trying to appoint scientist as professors whose research focus integrates an explicit gender and diversity focus. Examples for such new appointments would be “Diversity in Usability Studies”, “Diversity in Design

and Construction” (for a chair in civil engineering), “Gender Aspects in Biomedical Technology” etc.

### 27. Media Offensive “Fascination Technology”

One of the central challenges for engineering and science is the public image. While being accepted as important for technological advances and therefore economic growth, they are also perceived as dry and boring subjects. Technologically oriented programs often paint an unattractive image of technology as they focus on scientific theory and implementation but neglect to demonstrate social relevance. The result is a negative image of “soulless technology” as a simple means to an end, not as a field with its own aesthetic and fascination. This might be less of a problem for young men whose studies of a given field are often the result of a love affair with technology. In contrast, young women are more interested in social relevance than technology per se. The planned media offensive focuses on presenting mathematics, science and engineering as a vital and fascinating part of our modern culture. The methodology could be based on the experiences gathered in the popularization of mathematics at the MATHEON centre of research.

### 28. Media Offensive “SPIRIT”

A program can only be as good as its general acceptance and public interest. This is one major challenge for most current gender programs and measures to overcome. Gender programs have to incorporate and implement a pervasive PR strategy. This includes extensive online presentations aimed at addressing students living in more rural areas outside of Stuttgart itself.

### 29. eCRM “SPIRIT”

One major factor in the success of all measures described above is the continuous contact to the participating high school and university students as well as researchers. Our gender concept can only be successful if we manage to address these “customers” directly and tie them to the University of Stuttgart. To this end, an eCRM (electronic customer relationship management) will register and record all transactions between the University of Stuttgart and the participating students and researchers. As a result, they can be addressed directly and the life cycle process can be specifically tailored to each participant using intelligent agent systems (under the strictest observance of applying data privacy laws).

### 30. Brain Storming “SPIRIT”

The University of Stuttgart performs an annual brain storming on gender topics and diversity to define, select and implement further measures, with the participation of all interested institutes. The aim is a higher degree of flexibility and a stronger bound to the rest of the university.

## C. Measures to Ensure Structural Implementation and Sustainability:

To ensure the implementation and sustainability of gender concepts the following catalogue of measures is implemented:

### 1) Pervasive Implementation throughout the University:

The single measures are placed within the jurisdiction of existing institutions (e.g. the office for equal opportunity), organizational centres (e.g. career or academic counseling), and the chairs of the institutes. Concrete tasks, their implementation and adaptation are fixed in target agreements with the president of the university. Additional measures focusing on strengthening the gender competency are the object of future appointment negotiations and target agreements. Internal projects reinforce the acceptance and broad basis for the concept.

*a) Collaboration with Existing Equal Opportunity Programs:*

Plans of equal opportunity in the academic [15] and non-academic fields define a catalogue of measures aimed at achieving equal opportunity for women, based on detailed analysis of the current state. The structural and organizational preconditions for these measures already exist.

*b) Collaboration with the Female Professors Program:*

The program to increase the ratio of female professors becomes a vital part of the gender concept. Individual professors assume the operative responsibility for particular measures. These measures have already been made to increase the public visibility of the program.

*c) Strengthening the Scientific Gender Competency:*

The chair of "gender in the engineering sciences" is a component for the success of the gender concept. It strengthens the scientific background and provides the expertise required in the evaluation and long term quality control. The chair provides new input for additional projects and necessary adaptations. The competency of the chair is enhanced by the support of the office for equal opportunity and related chairs.

*2) Financing:*

Financing for the SPIRIT program is based on a three-pillar model:

*a) Budget:*

The present shift to success-oriented funding allows for funding further or extended measures. Target agreements with the institutes will initiate additional measures. Measures focusing on students directly can also be funded from tuition fees.

*b) Third Party Funding:*

Third party funding is an important component in the development and test of new measures and concepts. The EU, the ESF and the National Ministry of Science and Education as well as industrial partners have been increasingly supportive of gender and diversity projects.

*c) Endowment:*

It is planned to found a SPIRIT-Foundation to raise additional funds for the gender concept of the University of Stuttgart. This foundation will approach the industrial partners already engaged in the Femtec project, regional SMEs, alumni of the university, and private donors that recognize the need to support gender in the regional economy. The financial goal is an endowment providing a total annual funding of € 500.000.

*3) Responsibility – A priority for the President!*

The implementation of a pervasive and coherent gender concept is seen as a vital challenge for the future success of a technologically oriented university. The coordination, further development and quality control of the program will be the responsibility of the president of the university, who will manage the program. Further developments will be coordinated with the commissioner for equal opportunity under the leadership of the president.

## V. SUMMARY

The University of Stuttgart takes the female professor program of the state of Baden-Württemberg as an inducement to re-evaluate the currently used measures and proceedings in the area of equal opportunity and equal treatment. Where necessary these measures should be amended, enhanced and optimized. The major need for action does not affect the – numerous and successful – measures of the last years but does affect the gender culture at the University of Stuttgart. The measures should not only be carried by the equal opportunity department and the commissioners for equal opportunity. It is essential to further anchor the measures in research and teaching at the University of Stuttgart. At the same time patency and continuity have to be raised by developing a complete gender concept that views women and girls along a life-cycles model. It should group the different target groups and measures with regard to content and organization.

Furthermore, a natural science and technology-oriented university has to take special responsibility for the participation of women and girls in the evolution of technology in our society: Women are still underrepresented in almost all natural science and technological areas. This under representation has serious consequences – for women and for society. The demand for adjustment for women is not just a demand for equality of opportunity – in a country like Germany with few resources, economic success is tightly connected to advancements in technology. The future requirement for skilled personnel and managers in this field cannot be met by the current number of male graduates and the number of female graduates is nowhere close to enough to build the necessary specialized "mixed teams" which are expected to provide an important part of economic success.

The University of Stuttgart sees the sustainable implementation of gender-justice as an important challenge. The realization of a profound gender concept based on the observation of the complete life cycle with measures for different target groups – schoolgirls, female students and female scientists – will become an attractor for the University of Stuttgart to survive the fight for the best minds – on national and international levels. Within the scope of the overall process the university administration coordinates the existing activities and combines and expands on them. Numerous additional innovative measures are currently being prepared and will be sustained by a financial package containing budgeting, third-party funds, and endowments. The professorships within the female professor program serve as seeds for new impulses and will develop institutional and thus sustainable responsibility for important building blocks of the master plan. The gender mission statement is being created under the leadership of the

president including a road map with measures for quality control and operative realization – henceforth gender is given top priority!

#### REFERENCES

- [1] Europäische Kommission. Frauen und Wissenschaft – Mobilisierung der Frauen im Interesse der europäischen Forschung, 1999. KOM(99) 76
- [2] Europäische Kommission. Wissenschaftspolitik in der Europäischen Union, Förderung herausragender wissenschaftlicher Leistungen durch Gender Mainstreaming, 2001. Bericht der ETAN-Expertinnengruppe “Frauen und Wissenschaft”, Brussels.
- [3] B. Schwarze. Wer ist wirklich drin? Gender in der Informationsgesellschaft, 2003. Analyse mehrerer Studien und darauf aufbauende Handlungsempfehlungen.
- [4] G. Winker. Informationstechnik und Geschlechterhierarchie - eine bewegende Beziehung. in: Technikfolgenabschätzung. Theorie und Praxis, (2):70–78, 2004.
- [5] G. Koch, G. Winker. Genderforschung im geschlechterdifferenten Feld der Technik - Perspektiven für die Gewinnung von Gestaltungskompetenz. in: Stuttgarter Beiträge zur Medienwirtschaft, (8):31–40, 2003.
- [6] C. Wächter. Frauen in der Technik – Pionierinnen in Technopatria. in C. Wächter et. al. (eds.): Technik Gestalten, Interdisziplinäre Beiträge zur Technikforschung und Technologiepolitik. Kluwer Academic Publishers, München & Wien, 1998.
- [7] M. Zwick and O. Renn. Attraktivität von technischen und ingenieurwissenschaftlichen Fächern bei der Studien- und Berufswahl junger Frauen und Männer. Arbeitsbericht Nr. 219 der Akademie für Technikfolgenabschätzung.
- [8] N. Dahlmann, S. Jeschke, C. Thomsen, and M. Wilke. Overcoming the Gender Gap: New Concepts of Study in Technological Areas. 2006 ASEE Annual Conference Proceedings, Chicago/USA, June 2006.
- [9] N. Dahlmann, S. Jeschke, C. Schroeder, and L. Wilke. Challenge Diversity: New Curricula in Natural Sciences, Computer Science and Engineering. FIE 2007 – The 2007 Frontiers in Education Conference (IEEE), Milwaukee/ Wisconsin/USA, October 2007.
- [10] M. Elsner, S. Jeschke, N. Natho, O. Pfeiffer, and C. Schröder. Attractive Universities: New Curricula in Natural Sciences and Engineering. Meeting the Growing Demand For Engineers and Their Educators 2010 - 2020 International Summit (IEEE), Munich/Germany, November 2007.
- [11] M. Elsner, S. Jeschke, N. Natho, O. Pfeiffer, and C. Schröder. Attractive Sciences - Recruiting and Retention activities for women in academic CSET education. 2008 ASEE annual conference, Pittsburgh/PA/USA, 22.-25.6.2008.
- [12] M. Elsner, S. Jeschke, N. Natho, and C. Schröder. The Galilea Program – New Curricula for Engineering and Natural Sciences. SEFI Annual Conference, Aalborg/Denmark, 02.-05.07.2008.
- [13] N. Dahlmann, M. Elsner, S. Jeschke, N. Natho, O. Pfeiffer, and C. Schröder. Challenge Diversity: New Curricula for Natural and Computer Sciences and Engineering. 9th Nordic Research Symposium on Science Education, Reykjavik/ Iceland, June 11-15 2008.
- [14] N. Dahlmann, M. Elsner, S. Jeschke, N. Natho, and C. Schröder. Gender Gap in Technological Disciplines: Societal Causes and Consequences. 2008 IEEE International Symposium on Technology and Society (ISTAS 08), Fredericton, NB, Canada, June 26-28 2008, DOI: 10.1109/ISTAS.2008.4559761.
- [15] K. Thöne. Frauenförderplan für den wissenschaftlichen Bereich. [http://www.uni-stuttgart.de/gleichstellung/pdf/frauenfoerderplan\\_wiss.pdf](http://www.uni-stuttgart.de/gleichstellung/pdf/frauenfoerderplan_wiss.pdf), 2002. Last retrieved 25.01.2010.