

Girls And Computer Science

Attitude Formation Via Practical Experience

Sanne Grabisch Klaus Stein Ute Schmid

Faculty Information Systems and Applied Computer Science
University of Bamberg

puellae@wiai.uni-bamberg.de, {klaus.stein,ute.schmid}@uni-bamberg.de

1 Introduction

Regardless of huge efforts in the last decades the percentage of women in leading positions as well as in engineering and computer science is very low.¹ There are a lot of projects on the way to get girls interested in technical subjects and also support them in their career. “Pilot projects and campaigns have been launched for about 20 years to change girls’ and young women’s behaviour patterns with regard to their choice of career and to expand their spectrum of career options. Nevertheless, the number of girls choosing “typically female” careers or subjects of study is disproportionately high. In doing so, they do not fully exhaust their career opportunities.”²

The Faculty Information Systems and Applied Computer Science at University of Bamberg provides two projects for girls to gain practical experiences with typical topics of computing and computer science. “MUT – Mädchen und Technik” (girls and technology), and Girls’ Day. Goal of both projects is to give girls the chance to gain positive experiences regarding computers and technology and probably discover their interest in these topics to break up wide spread prejudices.

Both projects were evaluated by questionnaires during several years.³ Most of the questions allowed to select between different preformulated answers. As the questions

¹See e. g. Statistisches Bundesamt (<http://destatis.de>), for an overview: “In the Spotlight. Women in Germany 2006”.

²Kompetenzzentrum Technik-Diversity-Chancengleichheit e. V.:
http://www.girls-day.de/english_information

³For MUT we use a modified and abbreviated variation based on the longtime evaluation questionnaires of FH Coburg, for Girls’ Day we use an extract of the the questionnaire of the nationwide organiser Kompetenzzentrum Technik-Diversity-Chancengleichheit e. V., which is supported by Bundesministerium für Bildung und Forschung, Bundesministerium für Familie, Senioren, Frauen und Jugend, and European Social Fund.

Questionnaires can be found at <http://www.mut-bamberg.de/questionnaires.html>.

changed during the years, not all answers could be accumulated. In the following text we therefore annotate the year to the according questions.

2 MUT

MUT was initialised at FH Coburg in 2003.⁴ The Faculty Information Systems and Applied Computer Science at University of Bamberg, one of six MUT-locations (since 2005), provides a three day workshop program for girls from 10 to 14 years, which is attended by up to 80 girls each year. The workshops are supervised by scientists and cover the following topics: robot building and programing, algorithmic thinking, 3D-modelling, creating websites, assembling computer hardware, mobile GPS gaming, and business process simulation. All girls got questionnaires before and after MUT with around 20 questions in total.⁵

On average, the girls visit two workshops⁶ and were around twelve years old. They are mainly from gymnasium (high school). About 30 % of our girls attend MUT two or three times.⁷ More than half of all girls (56 %) attended MUT because they were curious and wanted to try it out (2006 and 2007). 35 % claim “computer science and technology is great” (2007), 33 % have been told by a friend about MUT (who often asked her to join, 2007).

Asked before and after MUT 2007 whether they can conceive to have a profession concerning technology nearly 50 % (slightly) changed their mind: more girls (pre: 7 (13 %), post: 12 (22 %)) say “Yes, thats absolutely suitable for me”, but there were changes in all directions.⁸ The number of girls who *A*: “like to deal with technology/informatics” raised from before 27 (50 %) to afterwards 33 (61 %), in which 4 girls changed to *B*: “sometimes it’s difficult to deal with technology, therefore it’s not always fun”, but 9 girls switched from *B* to *A* (2007).⁹

Most girls (73 %) say that such campaigns can enthrall girls for technology.¹⁰ They want more such programs (61 %), and only 7 % think that girls'-only-programs discriminate boys (2006 and 2007). 55 % of the girls think that they dare more easily, to try something new on girls'-only-projects. But there is no majority for the statement “One learns more without boys” (35 %, 2006 and 2007), 36 % claim “I do not care whether boys participate, I do not notice any difference” (2007).

Asked “What did you like most?”, 76 % emphasised on “to make something on my own”

⁴Dipl.-Ing. Ina Sinterhauf; <http://www.hs-coburg.de/kompetenzbuero>

⁵2007: 69 pre and 66 post questionnaires, from in total 78 girls; 2006: 57 pre and 54 post questionnaires from in total 67 girls.

⁶some girls attend up to 5 workshops.

⁷In 2007, the third year, 11 % attended all Bamberg MUT events.

⁸We had a similar question in 2006, due to slightly different wording we could not accumulate both years.

⁹Changes from and to other answers were negligible.

¹⁰Some girls cancelled the word “girls” and replaced it with “all people”.

(by far the most called answer). Second was “that I have learned something new” (64 %), and third was “doing something concerning technology” (51 %).

3 Girls' Day

Girls' Day (“Future Prospects for Girls”) is a nationwide practice day for teenage girls, who visit technical enterprises, technical training facilities, universities and research centres for a practical training day: “Girls shall be particularly motivated and encouraged to seize their career options and to decide in favour of a qualified vocational training or degree.”¹¹

Girls' Day at Bamberg University starts with a lecture about what applied computer science and studying computer science means. The main part is the workshop program along similar topics as in MUT but with more advanced tasks. In 2007 we provided five, in 2008 six workshops, each with a theoretical and practical part.

In both years about 60 girls attended.

We invite girls from gymnasium from 9th to 13th form. As the official target group of Girls' Day is 9th or 10th form we unfortunately only reach few girls in their last year before university where the decision-making process if and what they want to study is in the critical phase. On average the girls are about 16 years (from 13 to 19 years).

We asked the girls about their opinion regarding some statements about technical and social working.¹² They had to choose between agreement, partial agreement and disagreement. Most girls agree jobs in engineering, information technology and nature sciences are varied (43 % agreement : 53 % partial agreement : 4 % disagreement ■■■ , social jobs: 71 : 28 : 1 ■■■), not boring (50 : 44 : 6 ■■■ to 66 : 29 : 5 ■■■) and – contrary to social jobs – well-paid (44 : 55 : 1 ■■■ to 8 : 66 : 26 ■■■) and demanded at the job market (58 : 38 : 4 ■■■ to 20 : 68 : 12 ■■■). They also think, that for women jobs in social area are easier to find as in technical vocations (74 : 16 : 10 ■■■).

Asked about the influence of this Girls' Day on their occupational future, most girls say, that they have no concrete idea about their future profession (52 % in 2007 and 2008) – they are still some years away from finishing gymnasium. 30 % think they got to know a field they are interested in, 22 % say, they can imagine, to work in this area. 20 % now know what they don't want to do. Girls' Day was attributed as “very helpful”, “a great practical experience”, “interesting” and “informative”, “it works against job stereotypes”.

4 Conclusion

Technology and computer science workshop days for girls are an important and working approach to overcome gender stereotypes. They allow the participants to gain own

¹¹Kompetenzzentrum Technik-Diversity-Chancengleichheit e. V.:

http://www.girls-day.de/english_information

¹²We evaluate since 2007.

experiences and help to get a realistic estimation of interests and capabilities.

The girls' answers show, that MUT and Girls' Day in fact do influence their perception of technology, of computer science as a possible profession and of their own abilities regarding computers.

We also see that even though they assign positive attributes to technical jobs, most of them follow traditional role models and prefer jobs in the social sector. These events will not and shall not push all girls into engineering. It will and should provide experiences which allow them to come to a well informed decision.

Our questionnaires are under constant improvement. In this text only a excerpt of the data is shown. A full report will be published in future work, part of our Girls' Day data is also evaluated and published in the nationwide evaluation Girls' Day of Kompetenzzentrum Technik-Diversity-Chancengleichheit e. V. MUT results are also incorporated in the long-time evaluation of MUT Coburg.