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Zauchner, S., Siebenhandl, K., & Wagner, M. (2007). Gender in eLearning and Educational Games (pp. 293 – 308). Innsbruck: Studienverlag

## **A Roleplay for Girls: The Research Based Development of an Interactive Career Platform**

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**Key words:** educational games, girls, career platform, role play, job orientation

### **Abstract**

*In spite of the fact that playing computer games is considered a relevant approach to technology, electronic games and simulations have hardly been used at all for developing approaches to increasingly integrate females into ICT, engineering and scientific careers, and educational pathways. The following article outlines the research-based development of a career platform for girls aged 12 to 16. As a starting point for the development process, a European wide needs analysis was conducted in order to explore the needs and expectations of the target group. The core element of the platform is an interactive role play enabling girls to experience women in ICT, engineering, and scientific careers by means of simulated working days.*

### **1. Introduction**

In Europe, currently more females than males are pursuing academic studies, and the number of female graduates is, with only a few exceptions, higher in all member states. Further, the number of females with university degrees is increasing faster than that of their male counterparts. In spite of these facts, fewer women attain postgraduate qualifications through completing postgraduate academic and doctoral programs and in terms of study subjects, gender-based differences are particularly striking in scientific-IT disciplines [1]. This is not surprising when considering that quantitative and qualitative differences between girls and boys in terms of computer usage can already be observed during compulsory school education [e.g. 2] or, for example, that differences can be found in active participation in class in subjects such as mathematics, chemistry and physics [e.g. 4, 5].

A number of initiatives aim at facilitating access to ICT (information and communication technology) education for girls and young females [for an overview in Austria see: 7]. However, the potential of educational games remains largely untapped, although several studies have shown their positive effects, both in terms of motivation of students as well as their acquired skills. In addressing the emotional and motivational component, games have a great potential for teaching: Studies have shown that students display greater interest in subjects such as mathematics, physics and chemistry when the affective domain is addressed [e.g. 8, 9, 10]. Hamer et al. [11] objects in this context that “(...)

teaching methods in the past have perhaps been too concerned with the need to fill minds with fact rather than to stimulate them” and Alsop & Watts [8, p.30] advocate for an “(...) appropriate balance of informed excitement and animated understanding”.

Several research projects indicate that games can create motivating and engaging learning experiences and they also can provide students with a framework of rules and roles through which they can learn interactively and experiment with new ideas and strategies [e.g. 12, 13, 14]. Positive effects of simulations and strategic games were observed in respect to problem-solving skills, the understanding of complex matters or strategic thinking [15]. Furthermore, a study conducted by Subrahmanyam & Greenfield [16] found that video games may improve spatial skills, particularly in adolescents with poorer test results prior to the intervention.

In this respect, it is important to state that computer games have nowadays become a crucial element of youth culture. According to a study carried out by Medienpädagogischer Forschungsverbund Südwest [17] for example, 61% of all German households with adolescents are equipped with a play station. A study conducted in 2005 by Alice Taylor and Adrian Woolard for the BBC [18] found that in the UK all children aged 6 to 10, 97 % of the children aged 11 to 15, and 82 % of those aged 16 to 24 indicate having played a computer game at least once during the last six months. In respect to the cultural and educational component of electronic games, Fromme [19] argues that “(...) any educational or teaching effort which aims at mediating so-called ‘media competency,’ computer literacy, or ICT skills is preceded by informal and non-formal learning processes of children within their ‘computer gaming culture’.” According to him, for the young generation, computers represent a natural medium in the context of knowledge transfer.

When considering the gender ratio in terms of games, it is striking that according to the German JIM (Jugend, Information, (Multi)Media)-study of 2005 61 % of all boys but only 15 % of all girls aged 12 to 19 play computer games more than once per week [17]<sup>1</sup>. It is however supposed that preschoolers of both genders are equally interested in computer games, while interest has been found to decline for girls later on [20]. One of the proposed reasons is that there are hardly any electronic games available that primarily address girls: “Unfortunately, the majority of today’s games are aimed at a male market and in addition are not of particular interest to girls”, for example Gorriz & Medina conclude [21]. Those games that were developed for girls are furthermore based mainly on gender stereotypes, both in terms of content and design [22]. Also the perception of computer games as a male domain [23] is regarded as an important factor for the gender gap in gaming. According to the AAUW (American Association of University Women) Educational Foundation therefore “girls need to recognize themselves in the culture of computing. Software should speak to their interests and girls should be treated as early as possible as designers, rather than mere end users, of software and games.” [3, p. xiii].

The assumption prevails that “[g]irls’ generally lower interest in computer gaming can be an introduction to a life in which technology plays a less significant role than it does for their male counterparts” [23]. Denise Agosto argues that the predominance of boys computer gaming may be responsible for the fact that females are underrepresented in technical professions and educational programs. Moreover, Justine Cassell and Henry Jenkins [22] argue furthermore that computer and video games are a simple method to promote computer literacy. Supporting this argumentation, for

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<sup>1</sup> Within the BBC-study [18] different figures were found: in the age group of 10 to 14 years 48 % of the girls and 53 % of the boys were found to play and within the 14- to 24-year-olds, 44 % of the women and 56 % of the men played a game at least once in the last months. However, differences in research methodology – especially in the definition of „gamers” – may account for the remarkable differences between the two studies. In the BBC study, a gamer is defined as having played at least once in the last six months, whereas in the JIM-study, gaming is defined as playing computers every day. It might be argued, that girls or women to a higher proportion can be found in the group of “light” players (less than once a month).

example Wilson [24] found computer gaming to be a predictor for successfully completing a computer course.

Against this background, the Socrates (Minerva) project Sitcom (Simulating IT Careers for Women) aims at promoting girls' and young women's interest in ICT, scientific and engineering professions, and related careers. The objective of Sitcom is to develop a web-based platform, whose core element is a career game enabling girls aged 12 to 16 years<sup>2</sup> to experience different scientific and ICT careers in a playful setting<sup>3</sup>.

Although a number of general models and typologies were presented that address constitutional elements and design principles [e.g. 25, 26, 27] of games, none of the models known to the authors take gender aspects into account and thus the specific needs of girls regarding the design of games. In accordance with a user-oriented design approach, a relevant aspect of the present research and development project therefore is to integrate the target group from the beginning into developing the content and design of the game. In a first step, therefore a European wide needs analysis was conducted prior to the implementation phase. This assessment addressed two relevant levels of platform development, on the one hand the level of content and on the other hand design aspects of the game. The following main research questions are part of a set of guidelines that were utilized in the context of the needs analysis in the participating countries:<sup>4</sup>

1. What are the central underlying messages that the content generation of the game should be based upon?

Is the target group sufficiently informed about such ICT, engineering or scientific careers? What are supporting and impeding factors for girls to choose a respective career? What are the barriers that make girls reluctant to enter such careers, what reasons prevent them from choosing such careers? What may be motivating for girls to enter these professions

2. What are the needs and expectations of the target group in terms of game architecture and design?

How does the game have to be designed in order to make it appealing for girls? What is important in terms of game architecture? Which games do they like? Which factors make a game interesting for girls? Which recommendations do the girls give for the development of the game?

## 2. Methods

The needs analysis for the development of the games was based on a qualitative approach, i.e. workshops with girls and young women were held in all participating countries. In addition to the perspective of the girls derived from the workshops, especially with regard to research question 1, and in order to counteract the possibility of reproduction of stereotypes in holding workshops with the target group, interviews were conducted with females already employed in ICT, scientific and engineering professions as well as female students who had decided on choosing a respective study.

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<sup>2</sup> Interest for different types of education and careers tends to develop early during childhood, while also adolescence appears to play a significant role in this context: Personal identity formation, in which gender identity is an inherent component, is one of the central developmental tasks at that age. Dealing with gender roles as assigned by society and the differentiation of school based and career related interests become central topics during that phase [6].

<sup>3</sup> Furthermore, subject matter links and links to educational institutions as well as biographies of women and female students in ICT and scientific careers and academic programs are offered.

<sup>4</sup> Greece, France, Austria, Poland, Romania, Spain, and Czech Republic

## 2.1. Workshops

In all the participating countries, workshops were held with girls aged 12 to 18 years. In order to find out about similarities and differences within the target group, the girls were divided into three age groups: One workshop was organized for girls aged 12 to 14, one for those aged 15 to 16, and a third one for girls aged 17 to 18<sup>5</sup>. A total of 21 workshops was held in schools, representing a broad spectrum of school types ranging from lower levels of secondary school, academic levels of secondary school to vocational schools with different specializations (e.g. wellness, languages, ICT, etc.). Altogether 261 girls participated in the workshops, the number of girls in one group varying between eight and 16 participants.<sup>6</sup> The workshops were held by teams of two to four persons and lasted half a day each.

In order to ensure comparability of the internationally assessed data, the organization, procedure and methods applied were synchronized across all workshops [details see 28]. The workshops were conducted on the basis of the same design that had been tested and adapted in accordance to the experiences of one “pretest workshop” in Monteuil/France. The single topics (see below) were elaborated in the context of group discussions and in small groups.

Topics that were discussed in the workshops were based on the main research questions presented in the introduction of this paper and included the following:

1. Attitude of girls toward ICT, scientific and engineering professions and their knowledge regarding such professions.
2. Factors that may prevent girls from choosing such careers.
3. Motivating factors for girls choosing such careers.
4. Types of computer games that are preferred by girls.
5. Expectations and recommendations of the girls for the Sitcom career game.

The workshops were recorded and after the workshop teams had completed their activities, the results were summarized in content with regard to the workshop topics. A comparative and comprehensive analysis of the single national results was performed by the first author of this paper. These analyses were based on the method of “initial screening” (German: “Grobanalyse”), which serves to determine the selective order of statement clusters that are first condensed, subsequently explained, and ultimately structured, or summarized as theses and explanations according to certain recurrent patterns [29, p. 71].

## 2.2. Interviews

In the context of the interviews with women that are currently employed in ICT, engineering and scientific professions, and with female students who pursue such careers, the focus was laid on analyzing supporting and impeding factors for such careers:

1. What has motivated the interview partners to choose such careers?
2. What were/are barriers that the women had/have encountered?

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<sup>5</sup> One of the results of splitting workshops according to age was a differentiation of the target group for the Sitcom career game for girls aged 12 to 16. Initially, it was planned to develop the games and the platform for the age group from 12 to 18 years, but the majority of young females pertaining to the group aged 17 to 18 had made their career choices already and were significantly more self-confident as compared to the other groups regarding their own abilities to pursue an ICT or scientific career.

<sup>6</sup> In one case, the number of participants was 22.

3. Apart from the workshops, also recommendations of the interviewed women for the development of the platform and recommendations for girls who want to pursue respective careers were assessed.

All interviews were conducted based on the same interview guidelines [details see 28] and lasted on the average in between 60 and 90 minutes. Six interviews were conducted per country, three of them with females that were currently employed in an ICT, engineering or scientific job and three interviews with students currently pursuing such academic programs. A high variety of professions and studies was aimed at, though in order to avoid many duplicates, the sample selection by the interviewers was coordinated. Choice criterion for the interviewees was accessibility for the interviewers, who themselves were recruited from the Sitcom consortium.

A total of 42 interviews was available, and 34 interviews were finally included into the analyses<sup>7</sup> (age range students: 19 to 30 years, age range employed females: 23 to 39 years). The interviewees cover a broad spectrum of professions within the ICT (n=15; e.g. Study of Telecommunications and Media, Software Consulting, IT Security) engineering (n= 11; e.g. Landscape Engineering, Environmental Engineering) and scientific (n=8; e.g. Mathematics, Physics, Biotechnology) branches.

The interviews were recorded, and in an initial step they were summarized in content by the interviewers according to the guideline questions. As previously described for the workshops, a comprehensive and comparative analysis of the national results was performed based on the method of “initial screening” (German: “Grobanalyse”) [29, p. 71].

### 3. Results

The results of the workshops and the interviews in the participating countries interestingly demonstrated a high number of common factors. With few exceptions, impeding and supporting factors for pursuing ICT, engineering, or scientific careers were very consistent across the various countries. Regarding the recommendations for the implementation of the games and the games’ contents, also many common factors were found. In the following, the main results of the workshops and the interviews according to both guidelines will be outlined.

1. What are the central underlying messages that the content generation of the game should be based upon?

Even though girls did not generally exhibit a negative attitude towards ICT or scientific professions, it was found for all countries that they were not sufficiently informed about existing ICT, engineering, and scientific professions. Further, a considerable deficit prevails regarding information about educational pathways. In almost all the participating countries the lack of knowledge about professions in the fields of ICT, science, and engineering was evident. Especially the younger age groups only knew very typical jobs in these fields (e.g. mechanic, web designer) and did not have a clear picture of what it could mean being employed in a respective profession. This means that they just have a slight idea of job profiles for professions in science, engineering or ICT, that they cannot imagine a realistic working day in one of these fields and have no concrete idea of educational pathways in the respective branches. Lack of job information was mentioned as a major impeding factor by the interviewed women for pursuing careers in the field.

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<sup>7</sup> Individuals were excluded from the analysis after indicating in the context of the interviews that they had obtained ICT, scientific, or engineering degrees without however currently applying their skills in a professional setting. One medical doctor was excluded from analyses as she was mainly involved in work with patients and not as much in research.

In response to supporting factors for choosing such careers, it became obvious for the girls and even more so for the interviewed women that in this context-practical applicability becomes particularly relevant. They do not only want to learn theoretical concepts and elaborate on them on an abstract level, but they consider the integration of theoretical concepts with applicability as relevant. However, the girls and women do not only attach importance to applicability, but they go one step further and consider “doing good for society” to be relevant in terms of their career choices. They want to do something “meaningful”. One of the core supporting aspects for the girls seems to be the opportunity of being creative, to develop new ideas or products which could be beneficial for society or at least be practically relevant for other people. It is important for them to pursue new ideas, to let something develop and to contribute to an idea or a project. The interviewed girls furthermore associate with ICT and scientific professions that individuals employed in such professions are “up to date” and have something significant to say. Lastly, also higher wages and social recognition were consistently mentioned as motivating factors. Furthermore, the decisive role of the family, teachers and the peer group as well as early playful experiences with computers for their career decision was stated by the women interviewed.

Impeding factors for the girls include long training periods for the careers in question, might turn out to be very difficult, requiring a high degree of intellectual abilities. The girls suppose that such careers may only be pursued successfully with a good deal of persistence and invested effort. The women argued in the same way: they saw it as an obstacle that they were, in contrast to their male colleagues, supposed to give 150 percent. Particularly younger girls appeared to be less confident about their abilities to pursue such a career. Besides, they believe that the balance between work and family life may be endangered in the context of such professions. Additionally, both girls and women stated that they may/do encounter gender-based discrimination in such professions. Non-acceptance of women in “male areas” is therefore regarded an impediment. Finally, the theoretical orientation of education with too little practice and the lack of appropriate information concerning the professions were mentioned by the girls participating in the workshops.

## 2. What are the needs and expectations of the target group in terms of game architecture and design?

Within almost all the workshops held in the different countries it was remarkable, how exactly and clearly the girls envisaged a game which might be interesting for them to play. Although the interviewed girls, consistent with the literature, have not turned out to be “game freaks” regardless of their age, games such as “The Sims” or “Sim City” (<http://thesims.ea.com/us/>) were ranked as their favorites. They particularly like the fact that they are able to try out different roles when playing those games and are at the same time able to be creative. They value the reality based design of the game and being able to directly experience and perceive the results of their activities.

Quite consistent with the interviewees’ recommendations the girls wish to identify with the characters of a game and ask for opportunities to adopt their protagonists’ roles. They do not desire implementations in terms of “cyber girls or – women” but rather prefer realistic characters for the design of a game. The girls were interested in obtaining a realistic picture of a real woman, performing a real job in their fields of interest: “It should be possible to create a virtual woman. This woman can be sent to different working settings in the field of ICT, engineering and sciences, where she performs the tasks required for the specific working situation” (Workshop 2 – girls aged 15-16, Austria). The characters ought to be self-confident and authentic and thus supposed to give the young women a realistic insight into the lives of females pursuing ICT or scientific careers. In this context, the profession itself and its relevant contents are just as interesting as the private lives of the protagonists. According to the girls, not only positive aspects should be highlighted but also disadvantages and problem areas.

Also, consistent with the recommendations of the interviewed women, the girls wish to actively participate in the game, either by solving tasks or by being able to comply with various requirements. They propose either tasks in a professional setting or tasks relating to social scenarios or conflicts. The

interviewed girls believe that feedback about one's performance may be particularly helpful for subsequent actions.

Whenever the girls speak about the design of the games, they generally envisage 3D realization and desire an "appealing" design. Furthermore, the girls do not oppose violent depictions and time constraints consistently across all countries. Playing with others is preferred by the girls, from a competitive as well as a collaborative and communicative point of view.

#### **4. Implications for the game development and implementation**

In order to motivate girls to enter professional pathways in science, engineering and ICT, the messages to be transported through the single stories should be related to the encouraging factors for girls' and young women's job decisions to pursue careers in this area. However, they should also address the impeding elements and show possibilities how to overcome these obstacles. Based on the results of the needs analysis, the following recommendations for developing scripts and implementing the games therefore may be inferred:

##### *Information*

The girls' need for information on job profiles as well as on educational pathways for ICT, engineering and scientific professions was evident within the workshops. The games therefore should give an impression of the professions in this area. The simulation of a regular working day of a regular woman as recommended by some of the workshop girls is regarded as a promising approach, as it can offer a realistic insight into the life of a woman working in the scientific, engineering or ICT fields<sup>8</sup>.

##### *Practical relevance and sense*

In line with recommendations of the Tech-Savvy Survey [3] to highlight the human, social, and cultural dimensions and applications of computers in order to entrench stereotypes, our research reveals that applicability and practical relevance of concepts in science, engineering or ICT should be focussed on. The girls and young women need to be enabled to identify some kind of "sense" by putting theoretical concepts into the context of practice. Also, the feeling of doing "good" for society or for others, emphasising the benefits of technology, engineering or science, is recommended to be addressed in order to arouse the girls' interest.

##### *Self-confidence*

Considering the impeding factors for girls to enter educational pathways in science, engineering and ICT, the image of these professions for the girls is that they are very difficult and demanding, requiring highest capability, endurance, and intelligence. Different from the older age group (17 to 18 years), who are quite confident in their abilities and express a "we can, but we do not want to" [3] mentality, the young girls lacked self confidence in being able to succeed in a job like that. It shall not be the aim to tell the girls that this is not true, but by providing realistic stories of "normal" women, identification could be facilitated in order to strengthen confidence in their own abilities. Telling stories of women, who also had their struggles, but in trying hard achieved what they wanted, might be

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<sup>8</sup> This insight is further provided by biographies of women in ICT, engineering and scientific professions, which can be assessed at the SITCOM platform. Further, links to educational institutions and to websites providing information on subject matters are displayed.

a suitable model for encouragement on the one hand, and complies with the girls' preference of games that emphasize stories and characters [see 23].

### *Creativity*

One key element to make a profession interesting for the girls seems to be the opportunity to be creative. It appeals to girls to develop new ideas, to let something evolve, or to be able to contribute to the development of an idea or project. Addressing the creative elements of the respective jobs therefore could be a promising approach in order to arouse interest in the respective careers.

### *Balance work-family*

In focussing on "normal" women, also the demystification of the idea that especially jobs in these fields challenge the work-family balance extremely might be possible. Also in this context, it is not the aim to tell them that this might not be a problem but that, on the one hand, it is often the same in traditional female jobs and, on the other hand, the role models can show that it might be hard and exhausting to cope with it but not unachievable. The same applies to the issue of sexism and gender stereotypes.

### *Active participation*

Active participation and interaction, key elements of learning with games [see e.g. 26, 25], can be achieved by the possibility of virtually performing tasks of the respective jobs. Realistic problems shall be addressed with the aim of giving a vivid picture of a typical working day in the respective professions. It will be important to give the girls a feeling of achievement, i.e. to provide feedback mechanisms in this context.

### *Identification, take over different roles*

Identification with the main character, ideally being a strong and self confident woman having control over the process should be an aim. The girls can be given the chance to choose different roles of women working in a scientific, engineering or ICT profession. Consistent with the findings of Subrahmanyam & Greenfield [32], in the analyses presented here, it turned out to be important for them to be able to put themselves into the position of the woman in the game. Taking over the role of the actor helps to ensure identification. The possibility of choosing names, dresses, hair colour, etc. are elements useful to make it one's own game.

### *No time constraints and violence*

Consistent with literature [for a review see 32], considering the career simulation storyline, it was generally stated that violence should be avoided. Moreover, quite a lot of them said that there should be no time pressure or time limit while playing the game.

However, for the implementation, we had to face some obstacles: Due to budget limitations, it will not be possible to implement the game in 3D. Therefore, a two-dimensional implementation that is appealing to the girls should be attempted. A focus shall be laid upon having the graphic design evaluated by the girls. As multiplayer elements were not intended for the initial concept, in order to respond to the needs of the girls for collaborative and communicative elements, which is also well documented in literature [e.g. 30], didactic materials intended to be developed for teachers and career counselors shall include communication and collaboration scenarios for the use of the games.



Based on the most frequently mentioned recommendations, a general contextual framework was developed for the implementation of the career game. It was decided to design the game as a role play, in which a typical day in the life of a woman operating in an ICT, scientific or engineering profession is presented in a condensed manner according to the outlined stages of the game (see below). The objective was to enable girls to perform “sample actions”, to experiment, to point out possible new alternative types of behavior. This concept mostly adheres to the understanding of learning according to constructivist didactics (see also article of Christina Schachtner in this publication). The role plays should focus on telling stories [see 31, 30], supplemented by tasks that have to be resolved in order to successfully handle and experience the day.

Six different types of careers were selected for the implementation<sup>9</sup>: a landscape engineer, an environmental engineer, a mathematics professor, a software engineer, a network administrator, and an IT project manager. The scripts were generated in close cooperation with women employed in these professions. This guarantees the implementation of reality-based stories of typical women in such professions and that the performed tasks reflect the requirements of the actual profession.

For the general course of each game, the following stages were determined:

*Personalization: The girls select an identity (dresses, hair style, colors).*

In order to facilitate identification with the protagonist, the users are able to individually select names, hair styles, skin and hair colors, as well as dresses and colors of the dresses. Subsequently, the girls may choose a game related to the specific professions as mentioned above.



Figure 1: Personalization; source: <http://www.donau-uni.ac.at/sitcom>

*Private context: The users get to know the protagonists in a private context (“breakfast situation”)*

In order to render a complete image of the presented woman, different private contexts of the women are shown during the opening sequences of the game – beginning of the day/breakfast scenario (single woman, mother with child(ren), single mother, relationship without children).

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<sup>9</sup> The games are programmed in Macromedia Flash, and due to the personalization aspect a database solution was implemented (MySQL and PHP).



Figure 2: Private context; source: <http://www.donau-uni.ac.at/sitcom>

*Professional context: The users get to know the woman in her professional setting*

The users are given insight into a given professional setting through the simulation of a realistic and condensed working day. They adopt the role of the presented woman and experience an average working day of a woman in an ICT or scientific profession.

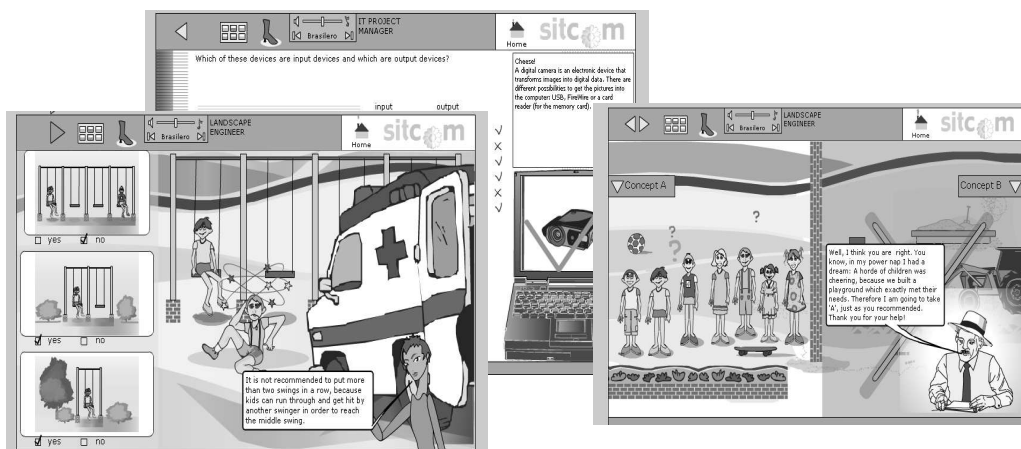


Figure 3: Professional context, tasks; source: <http://www.donau-uni.ac.at/sitcom>

Active participation is achieved through resolving various tasks. Different types of tasks are selected for this purpose (drag and drop, multiple choice, simulations, decisions, puzzles quizzes). The users perform reality-based tasks that pertain to a given profession or solve problems that may arise during a normal working day. For devising the tasks it proved challenging to select tasks that complied with a given profession while not being too easy or too difficult for the target group. Furthermore, the objective for generating the tasks was to consider their practical relevance and the creative aspects of the professions. Also, positive and motivating feedback was included when developing the tasks and the feedbacks.

*Implications: The users experience the implications or effects of the protagonist's work.*

A final scene presents the work results or products of one's work, as well as possible implications for certain individuals or groups of people. This is another reference to the practical relevance of an occupation and its benefit for society.



Figure 4: Implications; source: <http://www.donau-uni.ac.at/sitcom>

In addition to the needs analysis as described in this paper, further evaluations were conducted during the implementation of the games. These assessments included the evaluation of the executive summaries, the graphical design, evaluations of each implemented game by the target group, the evaluation of the platform by teachers and career counselors, and an external evaluation by game experts<sup>10</sup>. The approach of involving the target group into the development of the platform was not only an essential prerequisite in order to make sure that the girls' needs and expectations are respected, but an essential prerequisite in order to guarantee the quality of the envisaged product. Though it is evident that the Sitcom games hardly can compete with any commercial production, from a gender perspective for the authors the project is a success if it has contributed at least a little to the empowerment of the "silent audience" girls and to providing experiences of other or alternative possibilities for their professional pathways.

Have a look: <http://www.sitcom-project.eu>

## Credits

This project has been funded with support from the European Commission. This publication reflects the views only of the authors, and the Commission cannot be held responsible for any use which may be made of the information contained therein.

This project would not have been possible without the valuable contributions of the Sitcom consortium partners: Academy of the Humanities and Economics Lodz (Poland), Business and Management School Pau Casals (Spain), Danmar Computers (Poland), ORT (France), FiaTest (Romania), Romanian Society for Lifelong Learning (Romania), Webducation Software Planning and Development PLC (Austria), Western Greece Development Center (Gece).

<sup>10</sup> The concept on which the evaluations were based as well as their results will be presented in a separate article.

The authors would like to thank Mag<sup>a</sup>. Petra Wimmer for her professional support within the needs analysis.

## References

- [1] Eurostat (2003): Europa auf dem Weg zu einer wissensbasierten Gesellschaft: Die Beiträge von Frauen und Männern. Statistik kurz gefasst [online]. [http://www.eu-datashop.de/download/DE/sta\\_kurz/thema9/ns\\_03\\_05.pdf](http://www.eu-datashop.de/download/DE/sta_kurz/thema9/ns_03_05.pdf), [19. April 2004]
- [2] Durnell, A., & Thomson, K. (1997): Gender and Computing: A Decade of Change? Computers & Education, 28 (1), 1-9
- [3] AAUW Educational Foundation (2000): Tech-Savvy: Educating Girls in the New Computer Age [online]. [http://www.aauw.org/member\\_center/publications/TechSavvy/TechSavvy.pdf](http://www.aauw.org/member_center/publications/TechSavvy/TechSavvy.pdf) [July, 9th 2006]
- [4] Jahnke-Klein, S. (2004): Wünschen Mädchen sich einen anderen Unterricht als Jungen? Mathematik Lernen, 127, 15 – 19
- [5] Robinson, W.P. Gillibrand, E. (2004): Single-Sex Teaching and Achievement in Science. International Journal of Science Education, 26 (6), 659-675
- [6] Trautner, H. M. (2002): Entwicklung der Geschlechtsidentität. In R. Oerter & L. Montada (Hrsg.), Entwicklungspsychologie (S. 648 – 672). Weinheim: Beltz Verlage
- [7] bm:bwk (2005): good – better – best practice. Frauenförderung im Bereich Technik und Naturwissenschaften. IWeN: bm:bwk.
- [8] Alsop, S. & Watts, M., (2000): Facts and Feelings: Exploring the Affective Domain in the Learning of Physics. Physics Education, 35 (2), 132 – 138
- [9] Alsop, S. & Watts, M. (2003): Science Education and Affect. International Journal of Science Education 25 (9), 1043-1047
- [10] Matthews, B. (2004): Promoting emotional Literacy, Equity and Interest in Science Lessons for 11-14 Years Olds; the “Improving Science and Emotional Development” Project. International Journal of Science Education, 26 (3). 281 – 308
- [11] Hamer, R., Frinking, E., Horlings, E. (2005): Stimulating Science and Technology in Higher Education. An International Comparison of Policy Measures and their Effectiveness, RAND corporation [online]. [http://www.rand.org/pubs/monographs/2005/RAND\\_MG270.pdf](http://www.rand.org/pubs/monographs/2005/RAND_MG270.pdf) [Jan 19th 2006]
- [12] Leemkuil, H., de Jong, T., & Ootes, S. (2000): Review of Educational Use of Games and Simulations [online]. <http://kits.edte.utwente.nl/documents/d19.pdf> [15. Jan 2006]
- [13] McFarlane, A., Sperowhawk, A., Heald, Y. (2002): Report on the Educational Use of Games [online]. [http://www.teem.org.uk/publications/teem\\_gamesined\\_full.pdf](http://www.teem.org.uk/publications/teem_gamesined_full.pdf) [30 Jan 2006]
- [14] BECTA -British Education and Technology Agency (2001): Computer Games in Education Project [online]. <http://www.becta.org.uk/research/research.cfm?section=1&id=519> [15 Dec 2005]
- [15] Kraam, N. (2004). Kompetenzfördernde Aspekte von Computerspielen. Medien und Erziehung, 48 (3), 12-17
- [16] Subrahmanyam & Greenfield (1996): Effect of Video Game Practice on Spatial Skills in girls and boys. In P.M. Greenfield, & r.R. Cocking (eds.), Interacting with Video (pp. 95-114) Norwood: Alex
- [17] Medienpädagogischer Forschungsverbund Südwest, JIM - Jugend, Information, (Multi-)Media 2005 [online]. [http://www.mpfs.de/studien/jim/index\\_jim.html](http://www.mpfs.de/studien/jim/index_jim.html) [19 Jan 2006]
- [18] BBC (2005). Gamers in the UK: Digital Play, Digital Lifestyles [online] [http://crystaltips.typepad.com/wonderland/files/bbc\\_uk\\_games\\_research\\_2005.pdf](http://crystaltips.typepad.com/wonderland/files/bbc_uk_games_research_2005.pdf) [July 15th, 2006]
- [19] Fromme, J. (2003): Computer Games as a Part of Children's Culture. The International Journal of Computer Game Research, 3 (1) [online]. <http://www.gamestudies.org/0301/fromme/> [19 Jan 2006]

- [20] Mumtaz, S. (2001): Children's enjoyment and perception of computer use in the home and at the school. *Computers and Education*, 36, 347-362
- [21] Gorritz, C.M., & Medina, C. (2000): Engaging Girls with Computers through Software Games. *Communications of the ACM*, 43 (1), 42-49
- [22] Cassell, J. & Jenkins, H. (1998): Chess for Girls? Feminism and Computer Games. In: J. Cassell and H. Jenkins (eds.), *From Barbie to Mortal Combat: Gender and Computer Games* (pp. 2-45). MIT Press
- [23] Agosto Denise (2003). Girls and Gaming: A Summary of the Research with Implications for Practice [online]. *Teacher Librarian: The Journal for School Library Professionals*, 31 (3), [http://www.teacherlibrarian.com/tlmag/v\\_31/v\\_31\\_3\\_feature.html](http://www.teacherlibrarian.com/tlmag/v_31/v_31_3_feature.html) [July 15th, 2005]
- [24] Wilson, B.C. (2002): A study of factors promoting success in computer science including gender differences. *Computer Science Education*, 12, 141-164
- [25] Prensky, M. (2001): *Digital Game-Based Learning*. New York: McGraw-Hill
- [26] Meier, Ch., Seufert, S. (2003). Game-based Learning: Erfahrungen mit und Perspektiven für digitale Lernspiele in der betrieblichen Bildung. In: A. Hohensteiner, K. Wilbers. (eds.), *Handbuch E-Learning*. Köln: Fachverlag Deutscher Wirtschaftsdienst
- [27] Aldrich, Clark. (2004): *Simulations and the future of learning. An Innovative (and perhaps revolutionary) Approach to e-learning*. San Francisco: John Wiley & Sons
- [28] Zauchner, S. & Pegah, L. (2005): *Simulation IT Careers for Women: Needs Analysis report* [online]. [http://vk-server2.donauuni.ac.at/sitcom-moodle/mod/resource/view.php?id=12&subdir=/Needs\\_Analysis\\_Report](http://vk-server2.donauuni.ac.at/sitcom-moodle/mod/resource/view.php?id=12&subdir=/Needs_Analysis_Report) [Dec 12th 2005]
- [29] Froschauer Ulrike, Lueger Manfred (1992): *Das qualitative Interview zur Analyse sozialer Systeme*. Wien: WUV-Universitätsverlag
- [30] Inkpen, K., Booth, K.S., Klawe, M., & Uptis, R. (1995): Playing together beats playing apart, especially for girls. *CSCL '95 Proceedings*, 1-6
- [31] Cassell, J. (1998): Storytelling as a Nexus of Change in the Relationship between Gender and Technology: A Feminist Approach to Software Design. In J. Cassell and H. Jenkins (eds.), *From Barbie to Mortal Combat: Gender and Computer Games* (pp. 298-327). MIT Press
- [32] Subrahmanyam & Greenfield (1998): Computer Games for Girls: What makes them play? In J. Cassell and H. Jenkins (eds.), *From Barbie to Mortal Combat: Gender and Computer Games* (pp. 46-71). MIT Press

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