SIMULATING IT CAREERS FOR WOMEN - 114444-CP-1-2004-1-AT-Minerva-M

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Abstract: In all sectors of education women are still clearly underrepresented in courses related to ICT, engineering and science. This is the case not only in the choice of courses in higher secondary education, but also at university level and in adult and vocational education. While a number of initiatives and projects have aimed at increasing the access of women to technically oriented education, the potential of using simulations and interactive games in this context has hardly been explored yet.
This is rather surprising, as several studies conclude that simulations and games can create realistic, appealing and essentially motivating learning experiences.
SITCOM-"Simulating IT-Careers for wOMen" is a EU financed Socrates/Minerva project which aims at using the considerable potential of simulations and games to motivate girls and young women at the age of 12 to 18 to enter educational pathways related to information and communication technologies (ICT), science and engineering.

Keywords: Software Engineering. Models, Methods and Tools.

1. AIM OF THE PROJECT

In almost all the participating countries the lack of knowledge about professions in the fields of ICT, science and engineering is evident.
Especially the younger age groups focus on typical jobs in this field and do not have a detailed picture of what it could mean being employed in one of these fields. This means that they just have a slight idea of job profiles for professions in science, engineering or ICT and they cannot imagine a realistic working day in one of these fields.
The overall aim of SITCOM is to contribute to positive and inspiring encounters with technically and scientifically oriented matters, to help girls and young women understand how science relates to applications in the real world and to help them appreciate the beneficial impact of ICT, science and engineering on society.

Therfore it appears that the professional orientation provided by school teachers, counsellors or relatives in this case has some shortcomings.
Possibly resulting from the above, a lack of interest for these professions was observable. In general, the majority of the girls were not very interested in ICT, science and engineering careers

This does not mean that attitudes towards jobs in the science, engineering or ICT area are generally negative - especially in Greece and Romania the girls´ opinions about jobs in ICT were quite positive. Further, in almost all the workshops the girls´ final statements addressed the issue that it was a very positive experience for them having the possibility of discussing the issue, getting information and rethinking stereotypes.
The girls appeared to have a need to know more about job possibilities in these areas.

Beneficiaries:
Girls and young women in the age of 12 to 18 years.

1.1 Barriers making girls less eager to choose ICT, engineering and scientific professions.

One of the main barriers mentioned by the girls is that they consider ICT, science and engineering jobs as needing high capabilities, endurance and intelligence and that one has to be smart, diligent and very energetic when getting involved professionally with these jobs.
They find such careers difficult and demanding for the intellect and memory. Also the length of studies and high level of mathematics required were seen as a barriers.
In this context younger girls seem to be less confident in their own abilities as being able to pursue a career in the above mentioned fields, whereas the older girls are able to rely on their capabilities. For them it is just the different interests between girls and boys that lead to a gender gap in these professions and not the basic abilities. They also identify prejudices indicating girls to be more designated for humane disciplines and women having to follow careers suitable to their "main" role as mother and taking care of children.
In every country the issue of work-life balance was addressed by the girls. An important impeding factor for the entrance of girls into educational and professional careers in ICT, engineering and sciences was the prospect of having their own family. They consider that having a family and having to take care of children does not allow women to enter these professions because of the great work pressure and the amount of time they require.
A majority of the girls consider the sexism issue and social discrimination. The girls mentioned that women, though less well paid than men, have to give 150 percent in order to be accepted in a job like that. Also the difficulty for a woman to work in a man's world and the idea that ICT, science and engineering are male professions were seen as important barriers for girls to enter educational pathways in this area.
Finally, the theoretical orientation of education with too little practise and the lack of appropriate information concerning the professions were mentioned by the girls participating in the workshops.

1.2 Methodology.

Access to PC and the internet is given either at home or school except, for one Romanian group and some of the youngest girls in Poland.
In general they are not computer or internet freaks, but they know a lot of different tool and software. Many of them do their housework on the PC, almost all use the internet for communication (instant messenger, e-mail, chat, sending SMS). They use the internet for downloads of computer programmes, ring tones, music, etc., but also for research, and visiting special websites (e.g. horoscopes, news, women's topics, party documentations, teenager magazine …). They also use computers to play games.

In the time period from October 2004 until September 2006 the main purpose of the consortium of 11 European partners will be the development of an internet platform offering a number of resources related to girls´ and young women´s career decisions. Based on workshops with the target group and interviews with women in scientific and technical professions in all the participating countries the core element of the platform, a career simulation game will be developed.
Further interactive exercises spanning many fields of science and engineering are supposed to teach specific concepts through interactive simulation. To ensure a more fact oriented access didactically designed biographies of female scientists and links to other relevant sites on ICT/science/engineering will additionally be provided at the SITCOM platform.
Although many researchers are convinced that the use of simulations and games in the classroom has an enormous potential teachers are still rather reluctant to use them in their teaching practice. One of the reasons for this is the apparent lack of support materials like pedagogical scenarios, cases and exercises. The project therefore will provide teachers, trainers and educational counsellors with didactical and methodological materials and guidelines.

1.3 Innovation.

The project provides innovation at three levels:
1. SITCOM investigates a gender-specific approach at the educational use of simulations and other interactive games, which is an innovative attempt of increasing women's access to ICT, science and engineering.
2. Although many researchers (cf. most recently Aldrich, Simulations and the future of e-learning, 2003) are convinced that the use of simulations and games in the classroom has an enormous potential for the further development of –learning, the above-mentioned BECTA and TEEM surveys show that teachers are still rather reluctant to use them in their teaching practice. One of the reasons for this is the apparent lack of support materials like pedagogical scenarios, cases and exercises.
Therefore SITCOM will develop such resources for its envisaged products.
3. Using simulations and games in the process of educational counselling seems to be absolutely novel, since we have not found any references to projects or research of this kind.

1.4 Products and results.

The main product of the proposed project is the SITCOM internet platform which includes the following resources, all of which are specifically tailored for girls and young women:

Career simulation game. The unique and most important aspect of the platform is the career simulation game, a role-playing activity that allows girls to simulate careers in science and engineering and ICT-related professions. It teaches science/engineering concepts in a real-world context and encourages pursuit of careers in the field.

The key requirements for the game are:
• to include science and engineering concepts;
• to provide examples of the wide diversity of science and engineering career paths;
• to demonstrate the benefits of a technical career (challenge, satisfaction, contribution to society, salary);
• to illustrate different options in life (marriage, children, job changes, starting a business);
• to instil a sense of confidence that they could be successful in a technical career, and
• to instil a sense of power over the choices in their life, and demonstrate consequences of those choices, and to be fun to play.

Players begin with a character who is a school girl with a unique biography. They can select her background (name, picture, brothers/sisters, parent status (single, married, orphaned, etc.), geographic area, names of friends), or they can have the computer randomly select their background.

The aim is to provide a fun and educational simulation of events that could happen to them, so that they learn about issues in ICT, science and engineering in an interactive way. It is so much not trying to teach science and engineering, but rather expose the girls to the impact of science and engineering on their daily lives. By providing them with their own character and allowing them to make choices, they become more involved and interested.

At the end of the game, the player will have the opportunity to participate in further interactive games that relate to their career choices.
We will use a combination of Flash and HTML based programming to provide a dynamic and interactive feel to the site and engage the user from the very first page.

Through Flash programming the new design will present a contemporary look that is targeted to and rigorously tested by the target group of female students, including a professional usability study. To ensure the effectiveness, we will work closely with female students, teachers, and design specialists to collaboratively develop the aesthetics, look and feel, and navigational structure of the site.

Exemples -General frame for the stories. A short comic strip introduces the story, showing the private context of the women.
Between interactive parts animated comic strips are placed to develop the story.

Starting the platform. The girls enter the platform have the possibility to choose a nickname respectively log in with their old nick name.
Then they have the possibility to choose between nine single games, showing a regular working day of a woman and also presenting parts of her private life.
To get an idea what the girls can expect when choosing one single game, a “mini-strip” shows up as a teaser behind every menu item. Further a very brief description of the profession pops up, when the mouse is moved to the single games.

After choosing a game each of the single games will consist of the following steps:
1) Choice of name and outfit
The woman gets up in the morning, wearing a pyjama. The girl gives the woman a name and chooses clothes, hair colours, …
2) Breakfast situation
Within the breakfast situation the players get to know the private situation of the respective woman.
We want to show a variety of possible setting (e.g. breakfast with the family, with her husband, alone).

3) The working day
The women meet different realistic situations during a regular working day, have to solve problems, have to take decisions related to their jobs. There will be interactive and story telling parts constantly alternating. The story telling parts will be designed as an animated comic strip and the interactive parts contain different types of interactions, tasks, decisions (multiple choice, drag and drop, fill in the blanks, …)
4) Finish
Within the finishing scene the player will face a possible result of the presented professions one can be proud of.

Information on the Executive Summaries for the single Storylines. The aim is to get an idea of the storyline and the single tasks, which can be evaluated by a group of girls in one of the partner countries.

Information about the Scripts of the single storylines. The scripts are the basis for programming and graphics. It shall contain everything that should happen on screen at a certain point of time.

Additional interactive games. At least 20 more computer simulations, games and e-content related to the respective events in the career simulation game, spanning many fields of science and engineering, that teach specific ICT/science/engineering concepts through interactive simulation. The games emphasise critical thinking and problem-solving skills.

Additionally, they serve to engage the student through visuals, sound, and simulations of real-world activities in a manner that text alone can not convey.

Types of Computer Games. The computer games known and liked by the girls are basically adventure and strategy games, role playing games, didactic games and sports games. Sims/Sim City, Sacred, Pinball, GTA, Minesweeper, Age of Empire, Virtual Tennis, Tomb Mario Bross, Final fantasy, Rayman, Monkey Island, Tomb Ryder, San Andreas/ Underground,…
Practically in all the workshops irrespective of the age group the Sims/Sim City (http://thesims.ea.com/us/) was the girls' favourite. Asked for the reasons, the girls stated that the most fascinating elements are the possibility to create virtual persons, characters, houses, settlements etc. The player has an influence on the persons, the surroundings, the houses, etc., so that it is possible to create one's own game.
The girls like to actively participate and interact. Further the possibility to set actions like taking strategic decisions, caring for persons, fighting, defending herself, planting corn, etc. was very much appreciated. They like the realistic setting: the central elements of the games are normal persons and the more or less realistic sceneries.
Moreover the game can be continued adinfinitum, up to the moment where the player decides to quit the game. For the girls the game guarantees excitement and tension to the very end, amusement, and action.
For girls, a good computer game is characterised by a diversified graphical format, elaborated levels, tension, and diversity.

A good game is addictive, it is appropriate for amusement. If something does not work, one has try it again and again – until you succeed.
It is motivating for them to achieve different levels or other worlds, if constantly new and surprising situations can be detected. It is fun to achieve tasks, to win. Played with others it is seen as even more fun, from a competitive and from a collaborative point of view.
Finally, to calm down, to concentrate and to have action are additional aspects which make a grils want to play a computer game.
Violent and fighting games were generally rejected by the girls. All of pupils prefer nonviolent games, especially games where they are able to design game's scenery, characters or vehicles.

Biographies. The SITCOM platform will contain biographies of women scientists at different stages of their careers, including high school, college, and professionals, representing a diverse set of career interests and social backgrounds. Each biography is divided into several small sections to make it more readable/appealing to school girls. These sections include family background, education, hobbies/interests, college/career info and future plans. The biographies emphasize the individuality of each person, and include brief but specific details about the person.

Accompanying materials for teachers and educational counsellors. Didactic materials for teachers and guidelines for counselling staff on how to use the resources of the platform for giving female students advice on entering technical careers.

Links. Many links to other relevant sites on ICT/science/engineering and educational institutions offering respective courses. The platform and its content will be presented in English and translated into the languages of the project partners' countries: German, French, Spanish, Greek, Romanian, Polish and Czech.

1.5 Evaluation and dissemination.

After development the SITCOM platform will be submitted to product evaluation and evaluation on impacts on the target group.
Piloting with target groups in the partner countries, evaluation of scientific content and age adequacy by an external expert, feedback from teachers and counsellors and a usability study are elements of the project's evaluation strategy.
The resources developed by the SITCOM project will be available free of charge to the beneficiaries, teaching and counselling staff and their institutions.