Summary description

The ICT sector is one of the fastest growing sectors in the world economy, and it is essential that the EU builds on current excellence to become a dominant player, worldwide. A skilled workforce is an essential prerequisite. At present, the take up of ICT-related careers by women is very small; this has two important consequences. First is the loss to the economy of the talents of a significant part of the potential workforce; second is the direct economic implications for women, many of whom are excluded from very well paid jobs.

PREDIL's central concern was on the harmonization of societal needs and pedagogical practices.

PREDIL was built on the premise that evidence based gender sensitive pedagogical methods and teaching approaches can be catalytic in increasing both the quality of educational provisions and pupils' motivation in STEM related fields. In light of that the project's goal was to increase understanding into the processes that underpin the great imbalance in take up of ICT by boys and girls at school and university level and on such a base to develop a coherent and comprehensive gender sensitive pedagogical strategy supported by a self reflective (diagnostic and self-observation tools) framework for in-service teachers in order to address and remedy the imbalance.

The work undertaken has resulted in several tangible outcomes that can be considered as extensions to the guidelines documents (available at **http://predil.iacm.forth.gr/**):

- National reports on ICT, STEM and Gender.
- National analysis of resources.
- Interactive tools with orienteering framework.
- PREDIL Resources Library.
- National sections: various documents and files, also in country languages related to the national contexts.

One of the most important events was the final PREDIL networking conference and workshop "Conference Synergy Development between Policy and Praxis on Technology Enhanced Learning from a Gender Perspective"

September 7th -9th, 2010 (Spišská Kapitula, Catholic University in Ružomberok, Slovakia) **http://predil.ku.sk/.**

Predil tools

One of the key PREDIL deliverables was a set of tools. Principles used for the design of tools have been intended to be useful in a variety of European contexts, not only related to the countries represented by the consortium.

Principles applied while designing the tools:

- There are no universal 'truths' to be broadcast - though there are some universal questions about equality of opportunity, educational experiences, and educational outcomes. Project intention was to develop tools to support REFLECTION.
- Tools illustrate a class of tools, and there are leads to more tools - we cannot hope to be exhaustive.
- The exemplar tools should be easy to use, the first time.
- Tools should be extendable into fully fledged research tools.
- Education systems are composed of different layers - tools should be useful at different system layers.

Diagnostic self-observation/reflection tools for teachers

Concept Mapping

Concept Mapping is a method for teachers with the objective of illustrating and reflecting on new content of subject matter in class. By means of this method, knowledge and phenomena could be better structured and represented. Knowledge is often presented in a linear text based way which may impede the understanding of relations. The Concept Mapping method could be offered in this case. It facilitates the visual representation of different concepts and their relations; therefore this method makes the relationships with regards to content and consequences salient. By means of Concept Mapping, it is possible to involve your pupils in class actively and at the same time your pupils could learn to understand complex relations of one domain.

The results of the Concept Mapping method can be considered a gender-specific answer to the following questions:

- What is ICT?
- Ask your pupils: “Please draw a concept map with all your ideas about ICT”
- Are their views as you expected?
- What do your learners think ICT is?
- What surprises you?
- What are the similarities and differences between girls’ and boys’ views?

The 3R reflection Method

The 3R-Method is an effective instrument for analysing and implementing gender-specific dimensions. It can be applied in daily life, in projects and programmes, in public sectors, and in the context of school and teaching.

The results of the 3R-Method can be considered a gender-specific answer to the questions ”who receives what? and which are the related conditions?“ For this purpose, the method has a focus on aspects of representation, resources and reality.

Representation – Who?

In which way are women/girls and men/boys represented in learning materials?

- e.g. the share of women and men in texts and pictures?
- e.g. the quantity of women or men represented as active, leading, deciding?

Resources – What?

How are resources during lessons/ at the school (time, space, finances) allocated to female and male pupils?

- e.g. time spent on giving feedback to female and male pupils?
- e.g. do spatial conditions allow for gender homogenous or heterogeneous group work?
- e.g. facilitation of gender-specific interests, e.g. financial support for projects?

Reality – Conditions?

What are the reasons for the current conditions?

- e.g. norms, values, stereotypes as the basis of representations and allocation of resources?

e.g. addressing interests of both genders equally?

Self-reflection methods for teachers in classrooms for becoming coach and counsellor as teacher

Self-reflection is the process of thinking about oneself, one's behaviour, one's thoughts, values and beliefs. Reflecting on oneself is closely bound to learning and change as it concerns the personal self-concept: One draws one's attention towards oneself and one's performance, gaining the motivation to change what makes us discontent.

Enhancing the self-reflection of pupils constitutes the focus of the workshop. The workshop will first collect contexts and occasions where self-reflection in the classroom might facilitate the learners' progress or help to solve typical classroom-problems concerning performance, motivation or personal conflicts.

In the progress of the workshop, the scientific foundation of self-reflection will be introduced taking into account the therapeutical mechanisms and effects of self-reflection. Different methods to stimulate learners' self-reflection are introduced grounded in behavioral-focused psychotherapy, systemic coaching, and competency-based interventions – all of them techniques that aim to facilitate an individual's personal growth.

Common techniques to stimulate self-reflection are e.g. self-monitoring (e.g. diaries) or self-evaluation (e.g. contrasting perception of oneself and of others). Further interventions that can be accomplished by teachers and professionals in the field of training will be introduced and practiced (self-awareness training through e.g. role-play). Consequences of guided self-reflection are discussed and the profit of self-reflection for learners and teachers or trainers will be discussed.

Story telling

Story Telling, which means as much as the narrating of tales, is a method with origins in knowledge management and supports the communication of experiences. It is employed in organizations for enhancing implicit knowledge (inter alia also values and norms) and explicit know-how with respect to important occurrences, and it is then used as a starting point for resuming the reflection and discussion. The great excellence of this approach lies in its pictorial and analogous character. By means of a vivid narrative style, concrete associations are evoked at the listener, which are resuming on the rational, as well as the emotional level.

Using Innovative Interactive Displays to Provoke Reflections on Careers with Computers

We have developed computer-based displays that present information about the attainment of male and female students in a range of subjects, the take up of different subject options by girls and boys, and career choices and salary levels. The displays contain a great deal of information that can be explored actively by users. We provoke users to engage with the evidence by asking students challenging questions about the evidence, and by asking them to give career advice to girls with particular grades in different subjects. The session will involve an active exploration of these displays, and participants will be encouraged to think about ways they can include our displays in their own work. Examples of interactive displays can be found at **http://www.dur.ac.uk/smart.centre/freeware/**

Creative Classroom Activities that can Help us Understand Student Perceptions of Careers in Computing

How can we get authentic insights into student perceptions of careers in computing? A class of 15 year old students in a local school was asked by their ICT teacher to use *xtranormal* to create a short video with the title 'the ICT professional comes home at night'. The software package allows students to choose the appearance of the characters, their gestures, the scenery in which they are interacting, and the dialogue. When the video plays, the characters act out the students' scripts and speak the students' words. A set of short videos was created during the course of a single 55 minute lesson, by students who were seeing the software for the first time. These videos offer interesting insights into student perceptions of a sort (we believe) are hard to elicit via more conventional means such as questionnaires and interviews. We will show some of the student videos as the basis for a discussion with participants on student perceptions. The software produces speech of good quality in a number of languages.

http://www.xtranormal.com/about_state

National report Sumary

Online surveys were taken by more than **3300** secondary school students in eight different European countries in the framework of the PREDIL project. There were questions on experiences about ICT/computing at school and at home, ICT uses in specific subjects, as well as open questions about advice to teachers to help girls and boys learn about computers, about gender perceptions on doing a career on ICT, on gender views on proficiency on working with computers, and on family factors affecting career choice. Both descriptive quantitative and qualitative analysis (including wordcloud trends) were used. An initial result is that despite the efforts made in Europe for ICT take-up in secondary education, its implementation is still quite limited, and gender differences are relatively unimportant in secondary education.

GR

Under the Greek Constitution formal education is the responsibility of the State. The Greek system is characterized by the state's central control, although recently measures have been taken to devolve responsibilities to the regional level.

The basic aim of Primary and Secondary Education is to contribute to the holistic, balanced and harmonic development of the intellectual and psyco-kinesthetic powers of students, in order, irrespective of their gender and origin, to enjoy the opportunity to become fully developed personalities and live a creative life.

ICT has been included in the Greek Curricular Framework since the mid 90's. It is perceived as a tool to be used in everyday teaching, learning and communication. Yet, the course is delivered to youngsters in the context of a separate course (Informatics). Teachers are of course encouraged to use educational software but the existence of computer labs in schools with responsible teachers for the ICT laboratory and the course's subject matter itself does not support a comprehensive orientation to ICT as is implied by the curricular framework. The low impact teachers' professional development schemes have had in Greece -in relation to ICT integration in the curriculum of other subjects, leave but little space for innovation to be institutionalized in any formal level. This should be considered in conjunction to the entrance examination system in which ICT is considered from a programming perspective.

Digital convergence is among the current policies and goals of the Ministry. The aim is to enhance equality of access, reduction of digital literacy, development of new technology distance teaching, etc.-the Ministry's latest initiative being the provision all entering lower secondary school pupils with a free laptop computer at the beginning of the 2009-2010 school year.

The dimension of gender in choices of careers relating to ICT is far more balanced in Greece than other regions of Europe. The pipeline affect however is evident at the graduate and employment levels.

The effects of the implementation of the independent model of ICT on pupils choices of careers and professional engagement with ICT is rather low. In spite of this the dimension of ICT in the Greek curriculum appears to have facilitated discourse on gender issues. This is manifested in the selection of themes on professional meetings of the Informatics Teachers and in studies undertaken on textbook analyses and review.

The rich reflection and discourse on the professional level has not as of yet facilitated the emergence of specific guidance to support gender mainstreaming.

The annual studies regarding the use of ICT in Greek households show an increase in the use of computers and Internet for both men and women. Although the percentage of use by women grows faster than that of men there is still a significant gap between the genders-that seems to get smaller as time goes by. It is worth mentioning that in the young cohorts gender discrepancy in ICT use is rather small. Comparing Greek women's use with those of the European average it has to be said Greek women lag behind.

The gender distribution in universities can be described as men are overrepresented in polytechnics and sciences schools and women in theoretical ones. Nevertheless the percentage of women undergraduate students grows almost every year and their presence in the technological schools remains amongst the highest in Europe. Regarding graduate studies, it is men that mostly pursue these, a differentiation that is enhanced at the PhD level. This holds even more tru for ICT related programmes of studies.

In terms of resources being used in the course on Informatics, it is documented in the national literature that little progress has been made to lift the technical and consequently male orientation of ICT. Women are presented in the educational resources as utilizing ICT to a lesser extent than that of men and as such the representation supports the maintenance of social inequalities.

Teachers' perceptions on the gender gap appear to focus on two axes: societal stereotyping and the independent nature of ICT in the curriculum and classroom practices.

It is reported that girls are more hesitant to use new technologies and prefer to combine informatics with other subject matters (what teachers describe as the "cooperative approach").

Teachers experience has shown that it is the orientation towards programming that increases gender differences while these seem to be reduced when applications are used. Based on such observations, teachers advocate the need for a new curriculum that besides accounting for gender differences will enhance the integration potential of ICT in other subject matters.

E

The situation in Spain in respect to gender inequalities related to ICT shows the following trends: a) Secondary education is sensitive to gender equality in its main goals since it intends in this case to „Appreciate and respect gender difference and equality of rights and opportunities; and reject stereotypes that can lead to discrimination between men and women". A policy of gender equality is embedded at all levels in subjects and in teacher education, however the practice many times does not follow these policies; b) The same can be said about ICT, which is considered as a learning tool more than a subject, it is to be used in all areas and subjects. The main focuses are for information literacy, digital literacy and as a didactical resource; c) The reality might be different, especially in looking at the number of students selecting the scientific-technical baccalaureate, which shows a low representation of women in the technology option (only 22% of girls finished the technology baccalaureate, while 55% finished the Experimental Science & Health option in 2005); d) At university level, there is a clear under-representation of women in STEM studies. The situation in the STEM-related careers is worrying, since the number of students, both male and female, decreased 30% on average during the last 5 years, and in some universities the decrease has been 50%; e) Gender inequalities in respect to the access to services/information is also shown, however the access ratio for men and women is getting close. A similar situation can be seen in education & training; f) In the ICT-related industry women are underrepresented, not arriving at 22% in the best case, aggravated by the fact that women's salaries are lower than men's.

In the analysis of educational resources from the gender perspective, secondary school textbooks, both text-based and online (the new interactive students' digital manuals), in the areas of Technology, Mathematics and Informatics; a number of educational web portals, and teachers manuals completed the overview of the educational resources analysed, reaching a total of 25 items. The results show that the number of female references in texts in both offline and online materials is far below that of male references; in terms of pictures the percentage of women and men in pictures does not differ between offline and online materials; in both types of materials, women are again clearly under-represented (only 1 out of 3 is female). In general, the gender balance has improved in online resources, many times using neutral or impersonal references to avoid gender bias. In terms of teacher's resources there is a clear improvement in online resources as compared to those offline. As a conclusion, although the use of male generic references is still extensive, there is a certain improvement in the online resources, which indicates an evolution in society of gender awareness. Authors, publishing houses, policy makers and schools, each assuming their own responsibilities, should be more committed to finding active ways to achieve gender equity in the educational resources.

The Spanish quantitative survey found many similarities among girls and boys, but some sexist stereotypes among boys persist; fortunately, more girls than boys feel that computer proficiency has nothing to do with gender. In general, we find that gender differences are less important than previously thought in terms of school, teachers' treatment, family influences, and perceptions on ICT and career choices.

In the Spanish educational system, in which there are no compulsory subjects in computing and ICT (assuming that the best way to use them is across the subjects), the reality is that ICT in the classroom does not stand out, and it is mostly present in a few scientific/technical subjects. Students call for a pervasive use of computers in all subjects, both in the classroom and at home (mostly connected to Web 2.0 tools), as well as to improve both teachers' proficiency and personal attention to their needs and feelings. These are good approaches to fight inequality and attract girls to ICT. Students think that teachers, male and female, treat girls and boys equally in terms of ICT use; this goes against a certain stereotype of computers being a male oriented subject. On the other hand, family, socio-cultural and socio-economic factors are considered strong influences on pupils' choices. However it is important to say that twice as many girls as boys believe that they have freedom to choose their future career; in any case this position is held by a minority.

There is still a long way to go to make ICT and computers attractive enough at school among both sexes. In this respect, a low use of ICT tools in all subjects might hinder the opportunities for girls to use computers, assuming that their use is the best way to fight against gender inequalities in ICT studies and career choice.

F

The French quantitative study has analyzed the answers of 285 high school students having completed the online questionnaire, essentially during school hours. It should be born in mind that our sample is limited and cannot be considered representative of the general population of high school students. However, the sample is rather well contrasted and we think that the results we obtained are of some interest because they shed some light on a topic that is not so well known.

Regarding the different usage of ICT tools at home and at school, there are no significant differences between boys and girls, but some small differences can be found:

- Girls tend to answer "often" for using word processing and boys "from time to time". They tend to answer "never" for spreadsheet use and data base use, while some boys say they use them often.
- Girls are more likely to say they use graphic art software and that they perform searches on the Internet (they represent 71% of those having answered "often".
- A sharp contrast occurs about using forums at home. Among the 109 who said they never used them, there are 83 girls while there are 39 boys among the 64 respondents who say they use them often.
- Video games are rather something boys say they use more frequently than girls and the same is true about programming.

- Regarding the perceptions on ICT and carreer choices, results do not show striking differences between girls and boys, except for three points:
- The perception of the image of persons good at computing: boys and girls had different representations. Girls tend to estimate positively girls as well as boys succeeding well in computing, whereas boys tend to depreciate girls making a success in it.
- The stereotype concerning the fact boys would be better users of computers than girls. Girls rather disagree with this idea and the boys rather not.
- The implication of the equal treatment between boys and girls in courses related to the technology: girls tend to find that boys are better treated and conversely.

More surprising has been one of the findings about the advice that pupils would like to give to teachers: there is a significant request from pupils to receive an education allowing them to take into account better the technical dimension of computing.

This seems to us to confirm the responsibility, which falls to the educational systems to give to pupils the technical and theoretical necessary references for understanding of what takes place. For that purpose, teachers are irreplaceable actors.

D

Research results from Germany were derived from qualitative studies with teachers, students and ICT professionals, from a quantitative study with pupils, and from an analysis of school books.

The interviews of the qualitative study revealed many influences on several important aspects:

- According to the teachers, girls look for reasons to use a computer, while boys approach computers in a trial-and-error way. Boys generally show more interest in computer issues and a career in this field.
- The students mentioned that the decision for a subject at university is influenced by prior knowledge and interest. It is further influenced by parents and teachers but self-initiative to study is essential. The interviewees did not perceive gender-related difficulties at university but some difficulties in work life (e.g. combining work) are expected.
- The ICT professionals reported a general interest in ICT. Being a woman did not result in gender problems at university but in working life.

The results of the quantitative study show that there are hardly any differences between boys and girls regarding software, hardware, and internet usage. Boys are expected to be better at using computers, because of their interest in technology and experiences. Most respondents are of the opinion that girls are generally treated better than boys in technical classes.

A summary of the analysis of learning resources for teaching is reported. The results show a clear gender bias in the materials: in general, the representation of men and women in texts and pictures is biased to the advantage of men. In conclusion, it can be said that gender-differences in the field of ICT manifest in the context of school education, but also at home. Support structures for girls (and boys) need to be advanced at different levels regarding ICT.

GB

In the UK, there has been dramatic progress towards gender equality over the past 100 years, but there is still much to do. The UK has the worst gender pay gap in Europe. Through various national agencies the government have introduced initiatives aimed at improving gender equality, including the introduction of a minimum wage and a national childcare strategy to provide increased access to good quality, affordable, childcare.

The IT industry in the UK employs about 1.2 million people. However, across the industry, males outnumber females by about 4 to 1 and this has been the case for many years. This is despite the fact that girls outperform boys in GCSE ICT (aged 16). At A-Level (University entrance, aged 18) girls outperform boys, both at ICT, in which their representation is relatively high, and in Computing, where their proportion is much less.

Despite this superior achievement by girls at school the proportion of girls entering the ICT industry is very low. Numbers of boys and girls electing to do ICT at GCSE are very similar (45% Girls), but despite achieving good grades, a large proportion of girls choose not take ICT or Computing at A-Level. Girls account for roughly 40% of students taking A-Level ICT and about 10% of those taking A-Level Computing. This trend continues at university level, where only about 15% of those choosing to take Computing or ICT at degree level are female. This raises the question of whether, despite surface equalities, girls may be leaving school with a negative experience of ICT or that they are positively opting for some other course of study or occupation.

Overall, across both sexes, there has been a decline in the number of pupils choosing ICT or Computing for further study. Issues about the percentages of females opting for ICT or Computing studies are somewhat overshadowed by the very marked decline across both sexes.

A small scale online survey of students (290 students from 3 schools) in the UK about patterns of usage at home and school and attitudes to ICT cannot provide any definitive conclusions, but may offer some suggestions for further exploration. The usage of ICT in school subject areas shows that, apart from ICT studies itself and working on projects, it is humanities subjects which make considerably more use of ICT in teaching than the scientific subjects.

As one might expect, the reported use of packages and educational software was higher at school than at home and the reported use of the social activities was higher at home that at school. Overall there was a higher reported usage by girls than boys: at home one might reasonably argue that these are independent groups but rather less so at school where the same pattern was observed. Some schools were single sex and some were co-eduational but we do not have enough data to consider whether school differences would account for the gender reporting differences observed. There could be a systematic reporting bias, i.e. that with the same experiences, girls would be more likely to report higher levels of use than boys would.

There is a clear gender divide in reported use in social networking activities. Messaging is the most common activity by a large margin, with playing games coming a clear second. Playing games is the only activity where the use reported by boys is higher than by girls.

There did not appear to be any strong gender differences in students' perception of how boys and girls are treated in ICT classes, or how good they are at ICT or the influence of family.

PL

The period of political transformation, started in 1989, brought about new legislation, which became the basis for changes in education. The right to education and the freedom of teaching in Poland are safeguarded by the Constitution of the Republic of Poland. It obliges the public authorities to ensure that citizens have general and equal access to education. The Constitution contains two articles that directly pertain to gender equality in the field of education. Despite the ratified international treaties and constitution regulations, there is a lot of criticism about the actions undertaken by the former Polish governments and parliaments. Some experts warn that nothing has been done to meet constitutional and international obligations concerning gender equality in education; on the contrary, both governing bodies have passed laws and pursued policies that reinforce stereotypes, support traditional family models, and discriminate against women in all fields of social life, including education. The Polish Ministry of Education has not offered guidelines for teachers, nor has it organized trainings to promote gender equality in school, family, or public life.

The results of research conducted in the project seem to confirm these findings. During interviews with teachers and students statements such as the following often appeared:

- Working in the IT industry requires availability, and thus is not suitable for women for which the most important are matters relating to the family and children,
- Employers prefer to hire men.
- Girls do not like to experiment, they prefer to just follow the instructions, as opposed to boys.
- Girls are suitable to study social sciences and humanities.

Results of interviews show that there is still much to be done in terms of changing stereotypes, especially among teachers who can subconsciously affect their own pupils.

Online survey results show that there are no significant differences in the use of computers at work and at school between the sexes, but several interesting observations can be found:

- Standard Software Applications - The only thing that can be observed is the minimum prevalence of boys in the use of databases, word processing and spreadsheets.

- Internet and social software - Regardless of gender approximately 90% of students surf the Internet at home, and 60% use the network at school (which is a surprising result.)
- ICT-supported communication, games and educational software - Boys more often create Web pages than the girls and do it at home (girls at school during lessons). Less than 25% of students had been in contact with educational software in schools.
- Programming, social networks and internet research - In school the activity of programming is taken by boys (in the house there is no differences, both sexes program in the same proportions). Almost 75% of girls use this kind of software at home (only 42% of boys).
- ICT Use in Specific Subjects - In schools the computer is used mainly during the ICT lesson. Computers are used by no more than 20% of the students in other fields.

University Course Considerations

In every area more girls consider further education. Girls prefer art and design, education & teacher training, humanities, languages and medical studies. Boys prefer to study in the STEM field.

A summary of the analysis of learning resources for teaching is reported. It has to be noted that the production and selection of materials for pupils and teachers and related accreditation and quality control processes need to focus on gender equality aspects more intensely. Furthermore, because of the free availability and exchange of materials, especially in online repositories and databases, teacher training and further education needs to raise teachers' awareness of gender issues and develop competences for a gender-reflective use of such materials during lessons.

SK

Not long ago before economic crises, Slovakia was referred to by the media as a European tiger with the fastest economic growth in the region supported by a number of foreign investments pouring into this small country in Central Europe. Some international corporations are present also in the field of ICT and have set up their service branches or manufacturing plants in Slovakia. Concerning the ICT sector in Slovakia, there is a relatively high presence of women mainly in low skilled positions like clerical work, in call centres and in manufacturing. In these fields wages tend to be lower in comparison to more lucrative ICT positions. In this respect high skilled IT positions are dominated by men. This is caused mainly by stereotypical views of IT professions as being predominantly male. Women represent less than 7% of bachelor and master IT students and just over 10% of PhD students in this field according to the data (2009) from UIPŠ.

PREDIL research results in Slovakia show that there are no major differences in ICT use in secondary school students, but there are differences in career paths resulting from stereotypes of typical professions for men and women. The quantitative research study across Slovakia approached almost 100 secondary schools. There were collected over 1100 completed online questionnaires after data cleaning from 18 schools with at least 20 respondents. The subject Informatics plays a minor role in Slovak curricula but it is taught as a separate subject that focuses mainly on ICT basics and the Office suite and can continue as an optional subject on Programming. From the analyzed data results there cannot be seen any major differences between boys and girls in use of ICT, apart from the fact that boys play games more often than girls at home.

There were also some minor insignificant differences (around 10%) in use of free time at home as girls tend to do more often presentations and research for school while boys tend to use more often spreadsheets and forums, do more programming, create and administer web pages and download data more than girls. As far as the school environment is concerned there are only some minor insignificant differences (around 10%) as girls tend to use more often email and social networks and boys tend to do more programming and use spreadsheets more often. There was an interesting finding in the main reason for connecting to Internet as around 50% of girls and 30% of boys stated social networks as the main reason, followed by chat and discussion forums for both boys and girls, downloading data and searching for information for hobbies by boys and searching for information for school by girls. Time spent daily on Internet by both genders was mainly between 1-3 hours.

As far as future career choice is concerned, we could see more significant gender differences with top favorites for boys with over 30% are engineering and technology, math and informatics, followed by business studies. Girls choose for their careers medical sciences, languages, art and design, business studies, natural and social sciences followed by humanities. This also shows that boys have a clearer picture of their future careers as respondents could choose multiple answers and presented are responses.

with at least a 20% share. How to attract more girls into STEM and specifically into ICT careers is a very complex question and has to be looked at from many perspectives, starting at an early age from toys used and games played, continuing with after school activities and hobbies, and finally by changing the dull image of IT computing male careers and giving girls more personal examples of jobs that take into account social aspects where social networks could play its part.

CH

Becoming a first-level player in the ICT sector, one of the fastest growing sectors globally, requires a skilled workforce. At present, the uptake of ICT-related professional and study careers by women in Europe is very small, The situation is no different in Switzerland. Data from 2009 from the Federal Office for Statistics indicate a strong progressive decrease in enrollment in STEM academic careers, including ICT (namely, Informatics and Engineering). The research conducted in Switzerland, especially in the region of Canton Ticino, explored the differences between boys and girls in approaching ICT, with a particular focus on the potential uptake of a study or professional career in ICT. After a focus group with teachers and interviews with women who had a career in ICT, the study involved 539 students in high school (grades 8 and 9) through a survey which collected both quantitative and qualitative data. The results indicate that there are no big gender differences when it comes to ICT use and perception.

Small differences are found in the perception of the gender digital divide, while relevant differences concern the view and values attached to a future professional career. In fact, data reveals that Ticino boys and girls have a common pattern of ICT use both at home and at school, with minor difference only in the use of graphics and word processing applications and in video games. We can therefore suppose that boys and girls at that age do not have a significant difference in ICT skills.

Moreover, the study found that there are no big differences in the perception of the GDD either. However, boys and girls have a different perception of themselves in relation to possible professional careers in the field of ICT. Namely, their expectations are different, with boys focusing more on potentially good work conditions, and girls expecting more from the human side of the profession. This difference however concerns only potential future jobs (so a distant future) and not the actual choice of a university program (a nearer future). Within its limits, the study delivers two interesting results in terms of understanding part of the roots of the gender digital divide. The former result calls researchers and practitioners to consider that the GDD cannot be tracked back to a difference in the actual skills of boys and girls with computers (as this was not mentioned neither by teachers, nor by students) or to the self-perception of those skills, or of the personal "digital identity". The latter result provides a hypothesis about where the key difference between boys and girl lays: in the expectations attached to a future professional career.

Such results provide hints for devising interventions in schools with the goal of reducing the GDD. First, they confirm the fact that training programs, aimed at developing ICT skills are important, but not central to this issue. Interventions on the GDD should rather consider working on the development of an attitude, or better a conception and image of the future, related to a possible career in ICT as not opposing the human values and relational expectations that girls have. This could be done through showing examples of successful women in the ICT field, and learning more about the actual content – not the techniques – of ICT careers and jobs in the practice. For example, showing the provision of ICT services to the media industry or in web development for non profit organizations, instead of simply explaining how the web or digital image formats work.

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