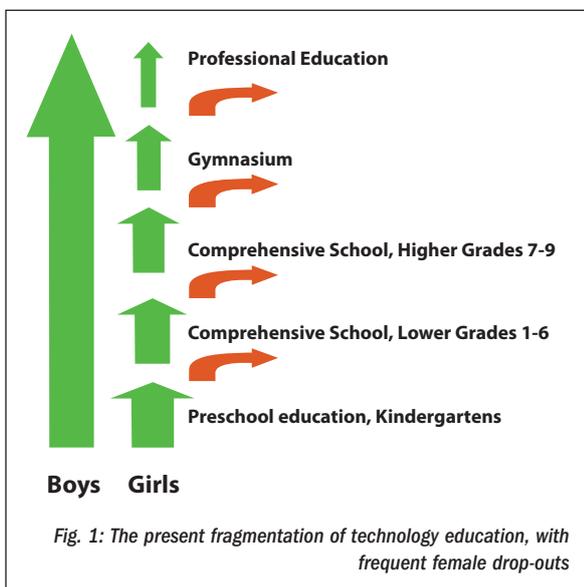


The gender agenda

Päivi Fadjukoff, from the University of Jyväskylä in Finland, calls for greater encouragement for women and girls to study technological subjects in schools...

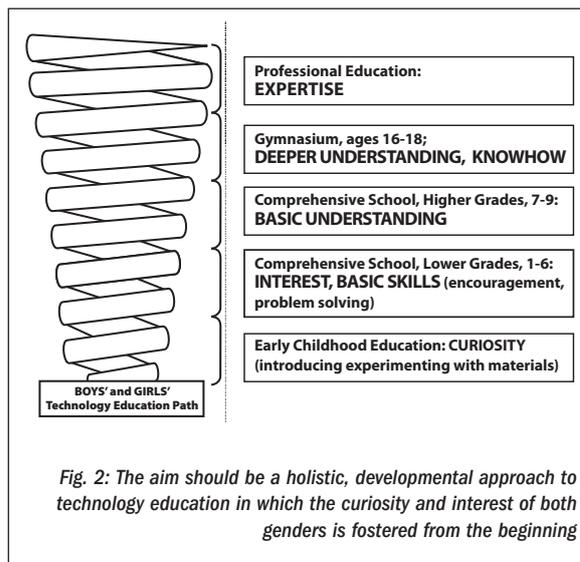
Women and girls throughout Europe are dramatically underrepresented in technological education areas and jobs. Even in countries with gender balance in the areas of mathematics and science, there is a marked imbalance concerning technology subjects. The Revised Lisbon Strategy (European Council, Brussels, 22nd-23rd March 2005) again highlighted the need to improve the human capital involvement, specifically women and young people, in the key sectors like Hi-Tech, ICT, etc. Accordingly, the issue of getting more women in technological or scientific education and careers has been approached by numerous EU and national projects. Yet the challenge persists. Even in countries where gender imbalance is not a problem in the areas of mathematics and science there is a marked imbalance when technology subjects are taken into account. Technology, where the science is put into action, is an area where the gender imbalance culminates.

As illustrated in Fig. 1, present technology education, in practice, differs according to gender. Although first contacts with technology are the same for both genders, their perception and understanding of technology start to differ at a very early stage: the interest in technology diverges, and more and more girls drop out from their Technology Education Path. This continuing phenomenon increases in the upper grades in comprehensive schools, and continues through further studies: the percentile of



girls taking part in technology-focused education decreases as they grow older. In the end, this distinction of boys' and girls' technology education results in a very small number of women in technology careers.

To tackle this challenge, we have created a developmental approach for technology education that will guarantee improvement and equality in technology education, and work to facilitate this approach with the multinational UPDATE project consortium. Compared to many other projects that have tried to involve girls in technology, our approach includes a strong focus on early childhood and primary education. At these ages, most attitudes are shaped quite sustainably. From this understanding, it is far too late to start to try raising the girls' interest at only secondary or later stages to attract female students to technology careers. Specific efforts need to be taken during girls' whole educational career to foster and maintain their continuous and growing interest in the area. This idea is illustrated in Fig. 2 with a spiral that refers to the holistic technology learning path, equal for both genders, starting with early childhood education.



Innovative aspect – starting from early on

To improve technology education, we need to create a holistic view of technology education and teaching. With new, improved technology education practices, it is possible to make technology more attractive for young

people, promote their interest, and encourage their critical and creative ways of thinking. As noted also by Gerhard Kraetzschmar, the Coordinator of the European project Roberta Goes EU, “the crucial factors in motivating girls are not the technical subjects as such, but the way in which they are presented using adapted teaching methods” (Research EU, June 2007).

According to the recent UPDATE project findings (report by Doina Balahur 2008), the females who select study and career paths within technology have a comparably high level of self-efficacy nurtured by persistent accomplishments in mathematical and technological disciplines along the educational cycles, have been featured by early diversity of cognitive interests, and the pleasure to play and watch machineries. Additionally, they have been supported, in the key moments, by their parents, both fathers and mothers, as well as by their teachers. The support of parents appears to be more important for girls than for boys.

The project shows that many activities and themes can be used to promote the aims of technology education already in early childhood education (an UPDATE report on pedagogical practices for early childhood by Leena Turja, 2009). Educators need to spark children’s interest, direct their attention and pitch discussions about technology around. At the same time, teachers have to examine and reflect their own attitudes and pedagogical ways to meet both sexes. The more technology increases within our living environments, the more important and possible it becomes to develop interesting and meaningful ways of teaching technological skills to every child.

Collaborating to find and facilitate good technology education practices

Within European collaboration and interaction, we have the momentum to learn from each other to build new, enhanced European Technology Education to prevent the digital divide between the genders, nations, and different groups of people in Europe. Educational systems can be changed, as recently highlighted in the SITES study, comparing usage of information technology in education in 22 countries throughout the world. The study revealed that many Asian countries have already awakened to the need to re-evaluate education. The emphasis on technology enhanced lifelong learning skills was substantially increasing in Asia – while it was alarmingly decreasing in some European education systems. The study defined ‘21st Century skills’ as follows: developing the ability to be self-directed, to keep learning throughout their lives, and knowing how to connect and collaborate with others – both their peers and experts – around the world.

It is evident from both the literature and the experiences within the UPDATE project that gender stereotypes in schools are strongly alive. Additionally, many teachers lack confidence about their own competence in technology education. At the same time, children and youth are growing in the knowledge society, learning to use technological devices from each other. As found in the SITES study, many teachers still use traditional teaching



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It is important to understand the functions of familiar technological objects

methods and experience difficulties in positively utilising and introducing technology in the classroom. It is not enough to provide the schools with the technology equipment, but that the change has to be facilitated with changes in teaching methods. This, in turn, necessitates development and new requirements of teacher training, as well as reforms in the national curricula of different schooling levels.

At the moment, the educational and curricular bottlenecks and barriers for efficient and equal technology education are many. In some European countries, there is no separate curriculum for technology education in all school levels, not to mention early childhood education. As concluded by Rasinen and Virtanen (UPDATE report on analyses of the girls drop-out issue in transitional educational stages), instead of differentiation between craft domains, technology should be taught for both sexes in mixed groups. This would also mean rethinking the learning content to be gender sensitive. As also implied in the SITES report, craft education could be regenerated toward modern technology, and technological content should be integrated in different subject areas. Although all teachers should be trained with basic know-how in technology, an effective way to guarantee technology teaching with trained, devoted teachers would be to develop a new school subject. As pointed out by Dow and Dakers (UPDATE report), little can be done without collaboration: there is a need to reformulate the pedagogy in partnership with researchers, teachers, schools and pupils to design and implement new and more radical interventions in the delivery of technology education.



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