

# Girls and Computing

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## INTRODUCTION

Much research conducted between 1977 and 1990 document the existence of a technological gender gap (Canada & Brusca, 1991) which has been studied extensively throughout the 1990s. This article provides an overview of research related to a specific segment of the digital gender divide: young girls and computing. This background, described as different waves of research, is followed by a discussion regarding the remedial actions aimed at making more young girls computer users, and implicitly also inspiring more women to study computer science. This latter aim is related to the women *in* computing problem, concerned with the lack of women in computer science, which is often seen as a consequence of the girls *and* computing problem.

## BACKGROUND: WAVES OF GENDER GAP RESEARCH

### Computing is Perceived as Masculine

There are few contributions actually suggesting that biological sex differences can explain why computers are associated with men (Hawkins, 1985). However, school computers were typically linked to mathematics and programming, while home computers were associated with violent computer games with competing male protagonists. Thus, both home and school computing has been perceived as masculine and seen to prevent girls from developing an interest in computing (Bromfield, Clarke, & Lynch, 2001; Charlton, 1999; Hawkins, 1985). Since computing was stereotyped as a masculine activity, gender “conscious” girls refused to be associated with computers (Newman, Cooper, & Ruble, 1995). Girls’ orientation away from computing was further strengthened by initial attempts to teach narrowly about the technology and programming, and by

situating computer education within the perceived masculine areas of science and mathematics (Charlton, 1999; Makrakis & Sawada, 1996).

### Girls Have Other Interests Than Becoming Computer Engineers

Both girls and boys see the advantages of computers in their everyday life, but girls are generally less interested in learning how to use them. This apparent lack of interest may be related to girls’ lack of self-confidence despite proving themselves competent (Shashaani, 1993). The “we can, I can’t” paradox means that young girls have a tendency to feel insecure about their own computing abilities, at the same time as they feel that women in general are as competent as men (Makrakis, 1993; Reinen & Plomp, 1993).

Girls tend to be confident although pragmatic computer users when studies or jobs require the use of ICT (Durnell, Glissov, & Siann, 1995). Girls want to use ICT to make learning more interesting. They are motivated by observable usefulness (Håpnes & Rasmussen, 1997). This apparent lack of interest in computing may also be due to biases in the research (Stuedahl, 1999) or that the research has not fully grasped how girls define and talk about computing. Many girls do not perceive their own playful computer use as “proper computer use.” The latter is defined as instrumental use like fathers do at work. “Proper computer users” are asocial boys who spend too much time in front of the computer (Gansmo, 1998).

Many girls construct a gender identity through “good girl” ideals (Kvaløy, 1999). The strive to be a “good girl” goes along with perceptions of the computer as a boring but useful tool. Girls with lower ambitions for their school work and future career and girls with more varied and hands-on experience with computers, are more inclined to learn more computing because of a less limiting idea of “proper computer use” (Gansmo, 1998; Nordli, 1998).

Many studies show that boys and girls differ in their enthusiasm for computers. Even though both may see computers as generally important in society (Livingstone & Bovill, 1999), more boys than girls rate computer skills important in their future (Holloway, Valentine, & Bingham, 2000). Consequently, boys are more inclined to study computer science.

A typical “girls’ use” is writing, using a word processor to write poems, diaries and stories. Girls also like to communicate and to use the Internet for information gathering (Håpnes & Rasmussen, 1997). Thus, girls seem to apply computers as a tool in people-to-people interaction (Hanor, 1998). Even girls who are reasonably confident at computing are not necessarily drawn to the discipline: “we can, but I don’t want to” (Durndell, Glissov, & Siann, 1995).

### **Computers are Different, But so are Girls too**

The cultural meaning of computers is flexible (Livingstone & Bovill, 1999). The present generation of pupils will become acquainted with several kinds of computer applications in their everyday lives (Volman, 1997). Computer applications differ between homes and schools (Drotner, 2001), and include diverse and opposing tasks such as entertainment versus education, games versus work and so on (Gansmo, 2004; Hagen, 2003).

Computer use at school offers limited space for the playful activities girls find attractive, such as design, drawing, painting, surfing, and chatting. Further, girls’ general refusal of the computer as technology and particularly of computer games may be seen as a symbolic downgrading of boys’ intense and playful action culture. This downgrading implicitly contributes to upgrade the relational and intimate nattering girls’ culture (Drotner, 2001), at least among the girls. This indicates that girls are not victims of technology. They have made an active choice (see Volman, 1997; Wyatt, 2003).

Through focusing on use it is observed that the range of computer applications available shape gender differences in pupils’ attitudes to computing—computers have a variety of potentials, some of which appear to be more attractive to girls, other to boys. Some studies also highlight competing masculinities and femininities, suggesting that important

differences exist within the categories “male” and “female” as well as between them (Gansmo, 2004; Holloway, Valentine, & Bingham, 2000). Such studies complicate the gender binary by showing that gender constructions are relational and mainly informed by heterosexual relations. Holloway, Valentine, and Bingham (2000) found that several secondary school boys regarded the techno interested boys as feminine and/or gay, which indicates that computing may not be linked to the kind of hegemonic masculinity associated with physical abilities like playing football.

However, most pupils claim that there are no differences between girls and boys. Girls who are interested can do it as well as boys (Lemish, Liebes, & Seidmann, 2001; Volman, 1997). Volman calls this the free choice repertoire, and explains this as lack of repertoire where gender inequality or gender-neutral positions can be denoted. Boys more often than girls apply an expert repertoire when talking about computers, while girls frequently apply an outsider repertoire. Instead of posing themselves as experts, girls are more down to earth in their conversations about computers, and they also present themselves as less skilled than the researcher found them to be. Accordingly, boys frequently posed as more skilled than they were found to be (Vestby, 1998; Volman, 1997). To the girls the free choice repertoire means that they are not passive victims of gender inequality, and the outsider repertoire implies that they contribute by choice to their own exclusion from the technology. These repertoires might hamper learning processes and should thus be tried replaced with new repertoires, for instance a user repertoire (Volman, 1997).

### **REMEDIAL ACTIONS**

The low number of girls and women taking an interest in ICTs still gives reason to worry (Bromfield, Clarke, & Lynch, 2001). Boys have better access to and make more and also more varied use of computers than girls do. Gender gap documentation shows that without interventions, men and women demonstrate different computer-related attitudes and behaviors (Canada & Brusca, 1991). Thus, several intervention programmes have been initiated.

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