Where have all the women gone?

Women in computing: what's the problem, why should you be bothered, and what can we do about it?

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What's the problem?
By the end of the war, of 2000 bombe operators, about 1700 were women.

Obviously there are many reasons for this – but nobody has ever suggested that these women were incapable, or in any way the “bottom of the barrel”. Quite the opposite.
Early computing pioneers weren't always male

ENIAC team
Really, they weren't ENIAC programmers
Women are (still) needed in the tech workplace

Currently women make up just 18.7% of those employed in SET despite making up 44.5% of the total workforce.

2010: less than 20% of the workforce were white male and under 45

If the employment rate for women remains constant, Europe can expect a shortfall of 24 million people in the active workforce by 2040 (the shortfall can be raised to only 3M if the number of women employed can be brought up to that of men)
But surely it can't be that bad?

University entrance numbers, male & female:
source: HESA 2012
OMG!

Soon – around 2015/2016 – there will be NO women doing A-level computing
So?

Maybe we don't need women in technical roles.

We're not good at sums.

All the jobs are going to India anyway.

We're over-emotional.

We don't have that analytical mindset.

We'll disappear to have babies.

There aren't enough jobs for guys anyway.

Our arms are too short to reach round the back to the network socket.
Gender differences in ability
Gender differences in performance

“Stereotype threat” is an idea introduced by Claude Steele, in 1995. Now widely researched.

This causes reduced performance in individuals who belong to negatively stereotyped groups.

If you think girls are bad at sums, and you're a girl, watch out...

Data from Osborne, 2007; test involves a simple maths test.
Success in mental rotation is probably linked with success in tasks such as “in flight and carrier based aviation engineering... nuclear propulsion engineering, undersea approach and evasion ... navigation.”

Success in mental rotation is probably linked with success in tasks such as “clothing and dress design, interior decoration and interior design ... decorative creative needlepoint, creative sewing...”

Sharps, Price and Williams 2004, quoted in Cordelia Fine 2010
Gender differences in expectations
(AKA science isn't sexy)

“...women, but not men, who viewed images ... or overheard conversations ... related to romantic goals reported less positive attitudes toward STEM and less preference for majoring in math/science compared to other disciplines.”

Effects of Everyday Romantic Goal Pursuit on Women’s Attitudes Toward Math and Science p1259, “Personality and social psychology bulletin” Park, Young Troisi & Pinkus, 2010
Gender differences in experience

“While most of the women say that all but a few of their male peers are nice and helpful, 22 percent of the women we interviewed mention having heard that they only got in because of their gender, and an additional 11 percent wonder if this may be true. Some women, although a minority, say they are completely comfortable in the program and that the small number of women is irrelevant to their experiences. Some even enjoy feeling unique and take pride in being one of a special few. Other women struggle with their doubts but emerge stronger, their self-confidence resistant to such concerns.”

There's an image problem

Top 5 (humanoid) images for programmer and computer scientist
Why should you be bothered?
Monocultures aren't fun to work in

“Sex-role spillover” refers to the way that gendered traits become workplace traits in situations where the workplace is gendered. An example from outside tech:

Female accountants were more likely than other groups to have high anxiety scores on the Hospital Anxiety and Depression Scales.

Male nurses had the highest rates of sickness absence.

Male nurses and female accountants also reported more work-related hassles than did female nurses and male accountants.

Evans and Steptoe, 2002, Journal of social science and medicine
Diversity drives up profit and revenue

The companies where women are most strongly represented at board or top-management levels are also the companies that perform best, both on organizational and financial measures.

Women give a different perspective to a company or brand

69% of companies who implement gender diversity policies report an improvement in brand image

57% of companies who implement gender diversity policies report an improvement in customer satisfaction

Women are the driving force of over 70% of the purchasing decisions in Europe (although they make up only 51% of the population) therefore a company’s sales people might be usefully women.
Why should you be bothered?

The current tech gender situation is...

- Bad for women (tech jobs are interesting and well paid)
- Bad for business (ROI, EBIT, etc. etc.)
- Bad for product image & brand (women are doing the purchasing)
- Bad for technology (missing out on talent)
- Bad for men in tech (working in monocultures is not a pleasant experience)
What can we do?
Don't dumb it down
Seriously, don't dumb it down
Don't make it all pink
Don't make it all pink (please)

“Feel safe in the unfortunate event of an auto emergency.”
Do encourage networking

• Computing is not a solo pursuit
  • “Lone geek” is a stereotype, and a problematic one
• Women-led events help loads
  • Networking, role models, advice, support
  • We always welcome men along (bcswomen, womenintechnology, & girlgeekdinners do anyway)
• Research suggests that women role models can be very important
  • Role model influence added to the prediction of career choice over and above women students self-perceived ability (Quimby & DeSantis, 2006)
Do engage with mentoring

• A mentor is someone you can discuss your career (and life) choices with, who's a bit further on than you.

• MentorSET is a great organisation that finds women mentors for women in SET

• Mentoring doesn't have to be same sex...

• It also doesn't have to be formal
  • Think about the women and girls you know – particularly the girls – and encourage them to engage with technology as creators, not just users.
Do visit your local school
What do schools want?

• Help with classes
• After-school clubs
  – Arduino
  – Raspberry Pi
  – Scratch/Greenfoot
  – General programming
• Talks (e.g. speaking at a school assembly on what computing careers can be like)
• This isn't just about the girls!
Do think about retention

• According to the UKRC, around 70% of women with degrees in STEM subjects aren't currently working in STEM jobs

• Why?
  – Culture (long hours, macho environment)
  – Career gaps (maternity, caring)
  – Remember stereotype threat?

• “A profession that's better for women is better for all”
  - Rebecca George OBE, Deloitte
Do get in touch

• If you want to get involved then we'd love to hear from you
• You can contact me on hmd@hannahdee.eu or on twitter (@handee)
• If you're a woman, join BCSWomen
• We don't have all the answers but we've read a lot of papers and been to a lot of meetings:-)
  – http://www.bcs.org/bcswomen
  – http://girlgeekdinners.com/
  – http://www.womenintechnology.co.uk/
And finally, remember...

There has always been a place for women in Computing.