AAUW CALIFORNIA ONLINE
PROGRAM SUMMARY
"SOLVING THE EQUATION" – Guest Christianne Corbett
September 15-17, 2015

The first AAUW California Online program for 2015-2016 featured Christianne Corbett, co-author of AAUW's new research study "Solving The Equation". It was necessary to make the program a short duration because Christianne was starting her PhD at Stanford on September 21st.

Members were encouraged to not only read the study that could be obtained at aauw.org, but also view the video featuring Christianne and Catherine Hill – also on the website. Additionally, members were encouraged to take the gender bias test at https://implicit.harvard.edu/implicit/

Christianne answered the first two questions to get the discussion going:

1) How did you become involved in this research?

Prior to working at AAUW, I worked as a mechanical design engineer in the aerospace industry. While working there, I became very interested in why there were so few women in my department and seemingly in my field overall. I went back to school to try to get a handle on this question and earned a master's degree in cultural anthropology focusing on women in technical fields. Soon after, I moved to Washington, DC with the goal of somehow working on issues related to women in engineering. Fortunately, I was hired by AAUW. When I first started working at the AAUW national office in 2006, the first project I worked on was the National Girls Collaborative Project (NGCP). Some of you may be familiar with that project. Through my involvement with NGCP, I became familiar with the National Science Foundation (NSF) and wrote a proposal for funding for what became *Why So Few? Women in Science, Technology, Engineering, and Mathematics,* AAUW's 2010 research report. Because *Why So Few* was a success for AAUW and NSF, in 2013 / 2014, I wrote another proposal to NSF to fund a report focused specifically on women in engineering and computing and it was also

funded. This proposal became this report - *Solving the Equation: The Variables for Women's Success in Engineering and Computing*.

2) What methods did you use for this research?

Solving the Equation is in large part the result of a large literature review that includes publications from many different disciplines including psychology, sociology, engineering education, computer science, and others. We searched academic databases for articles published primarily in the past five years containing certain keywords. A number of AAUW staff, contractors, interns and I read through hundreds of publications, looking for compelling findings to highlight in the report. Once we identified findings, we wrote up descriptions of the findings (first drafts of chapters 3-9 in the report) and sent them to our advisory committee of experts (who you can see listed at the beginning of the report) for their feedback on whether or not we should highlight those particular findings. I then made changes based on the advisors' feedback. After deciding on which findings to highlight, we interviewed the researchers whose work we were showcasing and wrote up the final versions of the chapters. For chapter 1, I came up with the charts I thought were important to include in the report
that gave the background statistics necessary to understand the issues and with the help of AAUW contractor Lisa Frehill (a PhD sociologist with an engineering background) was able to include nearly everything I'd identified either in chapter 1 or in the appendix.

HIGHLIGHTS OF THE PROGRAM

Participant #1 asked if there will be a follow-up study?

Christianne replied:

The last I knew, the next research report that AAUW is planning to release is on the topic of women and leadership. As far as I know, that is still the plan, but I've not been in contact with anyone at the national AAUW office for the past several months.

In my experience, the topics for AAUW research reports are chosen based on the pressing issues of the time, feasibility, relevance and

interest to AAUW members (including groups like the Mooneen Lecce giving circle who contribute money specifically for research reports), and the availability of one or more researchers with the relevant content knowledge who can write the reports.

As part of AAUW's most recent NSF grant, AAUW will be publishing a future research agenda around women in engineering and computing within the next year. This will be a document targeted toward the academic community of researchers more than a general audience. After that, as far as I know, AAUW has no plans to publish additional reports related to STEM.

Participant #5 asked what will be the roll-out of the program to reach a wider audience.

Christianne: Here's a bit about what I know about the rollout and efforts to reach a wide audience. Prior to the report's release, AAUW national's media relations staff reached out to journalists about the report, and we got a fair amount of media attention. The report was also released at Samsung here in California, as you may know. That was part of AAUW national's increasing efforts to attract corporate funding.

Because many of the recommendations in the report are targeted at employers, AAUW also hosted a corporate convening where AAUW presented the report's findings to corporate representatives.

Also, we've presented the report's findings at a number of conferences and events. One notable one - I'm excited to say that I will be presenting the report's findings at the Grace Hopper Celebration of Women in Computing to an audience of 500-1000 corporate representatives and women in tech in Houston next month.

She further replied: *Solving the Equation,* unlike *Why So Few,* focuses mainly on the workplace and not so much on education. It does include a chapter on the college environment but not much on K-12 education. As the recommendations are mainly for employers, they're a bit harder for AAUW members who don't happen to be engineering or tech employers to put into practice.

Having said that, some practical suggestions related to the educational environment come out of the work that's been done at Harvey Mudd. Making clear the broad applications of the fields of engineering and computing early on is one important recommendation that we can take from their work. Giving girls opportunities to learn engineering or computing in groups of others with similar past experience in these fields is another recommendation that is applicable to early educational environments. And exposing girls to environments in which they see many women in tech or engineering - a la the Grace Hopper Celebration - can be really transformative.

As far as holding employers accountable for their actions around diversity, the good news is this topic has really gained traction in recent years. As such, there are articles written on the topic and companies are eager to show that they are doing something. One thing we can do is write columns in newspapers or letters to the editor when a company does something positive - or negative.

Participant #5 asked: As you were working on the report, was there any part of the research/findings that surprised you?

Christianne: Yes, I was surprised at how dramatically underrepresented some women of color are among computer science and engineering graduates compared with their representation in the overall population.

For example, black, Hispanic, American Indian, and Alaska Native women together made up **18** percent of the population of 20 to 24 year olds in 2013, and were awarded just **3** percent of engineering bachelor's degrees conferred that year. (2% of the degrees were awarded to Hispanic women, 1% to black women, and 0.1% to American Indian / Alaska Native women). Black, Hispanic, American Indian, and Alaska Native women make up just about **1/6** of the engineering grads that they should if they were represented in proportion to their presence in the overall population.

White women are also underrepresented, but less so. White women make up a little less than half the proportion of engineering graduates

you would expect if they were proportionally represented (white women made up 28% of the population of 20-24 year olds and 13% of engineering graduates in 2013).

Looking at men, Black, Hispanic, American Indian, and Alaska Native men made up 19 percent of the population ages 20 to 24 and were awarded 12 percent of engineering bachelor's degrees.

So while Black, Hispanic, American Indian, and Alaska Native men are still underrepresented among those awarded engineering degrees – and even more so in the engineering workforce – they, along with men of every race and ethnicity, are much better represented than are their female counterparts.

Another participant forwarded a link to a PBS program that proved to be a bit controversial: http://www.pbs.org/newshour/making-sense/truth-women-stem-careers/

It provided lively discussions:

Participant #1: The PBS News blog is a great blog to follow. I had a couple of reactions to it: 1. She actually does affirm the basis for Solving the Equation as men do indeed outnumber women in the computer science and engineering fields. So I applaud AAUW and Christianne for tackling this topic in its research. 2. Ms. Cummins also makes the point that women undervalue themselves and here, again, I applaud AAUW for being in the forefront of this issue and all the Start Smart workshops that are conducted through AAUW. And lastly, the article's bottom line is exactly what AAUW is advocating: Equal Pay for Equal Work, no matter what the job!

Christianne's reply was: I agree with the author of this piece, Denise Cummins, that work traditionally done by women deserves more status and pay. And I agree with her assessment that the STEM fields where women are least well represented are engineering and computer science. I'm quite sure that AAUW has not suggested that women who pursue fields outside of STEM should feel ashamed. Rather, the reason that AAUW has focused on STEM fields and engineering and computing in particular is to highlight factors that

may contribute to these fields being less than fully open to women. I think the crux of the issue is that Ms. Cummins takes an individual's "interest" to be intrinsically determined whereas researchers interviewed for *Solving the Equation* and *Why So Few* emphasize that interest in a field can be sparked and cultivated in different ways. If biases and stereotypes prevent girls and women from developing an interest in STEM fields including engineering and computing, we want to bring those factors to light.

Participate #9 stated: Well, I was actually horrified by it. Perhaps it was her use of the word "shaming" that provoked me the most. Girls and boys should both be encouraged to explore various fields and inclinations and not be hampered by societal mores that denominate something as a feminine or masculine field.. The problem, it seems to me, is that girls are often actively discouraged from doing so, either directly by parents, or perhaps more insidiously, by our culture that classifies certain fields as masculine or feminine. They are also still discouraged from "being too smart" around boys—which perhaps steers them into career interests or school classes that are less likely to put them in competition with boys. Programs like Tech Trek are great because they give girls a chance to explore interests which might otherwise be dampened. If a girl wants to be a teacher or a nurse, more power to her, as long as she isn't making that choice because she doesn't think she can be an engineer or a doctor.

Participant #1: Thanks, Cherie for the link. The PBS News blog is a great blog to follow. I had a couple of reactions to it: 1. She actually does affirm the basis for Solving the Equation as men do indeed outnumber women in the computer science and engineering fields. So I applaud AAUW and Christianne for tackling this topic in its research. 2. Ms. Cummins also makes the point that women undervalue themselves and here, again, I applaud AAUW for being in the forefront of this issue and all the Start Smart workshops that are conducted through AAUW. And lastly, the article's bottom line is exactly what AAUW is advocating: Equal Pay for Equal Work, no matter what the job!

Participant #5: I saw your comments when you sent them earlier, Krys — although I confess I had done no more than skim the blog post that Cherie shared with us at that point. So at first I thought the

Cummings article was going to affirm what the AAUW research shows (as well as our advocacy efforts). But once I really read it, I didn't find Cummings' article's "bottom line" to be about equal pay for equal work, but rather that she is saying that actively advocating for girls and women to go into engineering/computing was somehow pushing girls into something that goes against their nature and that doing so also devalues the work women choose to do outside of those fields.

So much to ponder and reflect on. I hope you enjoyed our first program of the year and will continue to participate in the others planned for the year. November will be examining AAUW Fund (not Funds anymore!). Our guest will be Sharon Westafer, AAUW-CA Fund Chair.

I know you all join me in thanking Christianne Corbett and wishing her well in her studies.