

## Action Checklist

### STEMming the Confidence Gap—Mitigating Social Judgement and Social Isolation

April 22<sup>nd</sup>, 2015 Webinar with P. Sankar, J. Gilmartin & D. Gries

Computer science classes are highly collaborative, or rather they should be. It's tough to master computer science material without collaborating with others. And it's tough to collaborate with others when you look and feel so different from your peers. We see this in [studies](#) <sup>[1]</sup> of women leaving STEM careers: isolation is a key factor leading women to leave. What are some techniques professors can use to mitigate feelings of isolation among women and minorities in their engineering classes? Hopefully many academics will explore this very topic, but here are five starting tips:

Influence	Reflections
<b>Modify the lecture. Make Learning active.</b>	<ul style="list-style-type: none"> <li>✓ <a href="#">A recent study</a> <sup>[2]</sup> has shown that modifying course structures beyond the traditional lecture format can significantly improve student outcomes for some under-represented groups, and specifically for black and first-generation students taking biology courses. The study implemented course structures that encouraged ongoing study and skills practice and collaboration, or active learning, while decreasing the reliance on material from lectures, or passive, solitary learning. The result: the achievement gap between black students, and their white and Asian peers was almost halved, and the gap between first-generation students, and their white and Asian peers was almost eliminated.</li> <li>✓ Check out the <a href="#">EIT website</a> <sup>[3]</sup>, specifically the <a href="#">EIT Active Learning webinar</a> <sup>[4]</sup> to familiarize yourself with options for creating an inclusive, learning context.</li> </ul>
<b>Assign Project Groups.</b>	<ul style="list-style-type: none"> <li>✓ Research has found that small group work can help create a more collaborative and comfortable environment for learning, but students who feel different won't always have an easy time finding project teammates. Allowing students to self-select their project groups is akin to allowing the popular "jocks" to self-select their dodgeball teammates: the "non-jocks" will be isolated and then pummeled. If you allow students to choose their teammates, they will choose students like themselves, so choose for them—at least some of the time.</li> </ul>

<p><b>Segment Based on Experience.</b></p>	<p>✓ Harvey Mudd College has managed to bridge the gender divide in computer science through <a href="#">a variety of methods</a> <sup>[5]</sup>, including the segmenting of introductory computer science courses by previous experience. The experts take classes together, and the newbies take classes together. Women and minorities, who might otherwise have felt isolated in classes filled with white and Asian men who have been programming since childhood, know they're learning in a safe environment filled with peers whose experience levels are comparable to theirs.</p>
<p><b>Use Technology.</b></p>	<p>✓ A number of technologies are emerging to help instructors create more collaborative and active learning environments for students. Blended classroom environments, when implemented well, can reach new segments of students. <a href="#">Piazza</a> <sup>[6]</sup>, creates a collaborative learning environment, and the numbers show that <a href="#">it works</a> <sup>[7]</sup>: students are highly engaged, spending on average three hours per day on the platform. More tellingly, women are equally engaged and, in fact, ask more questions than men. Jeff Offutt, a software engineering professor at George Mason University, reported that changing his small class from an in-person to an online format actually doubled participation rates and encouraged shy students to actively engage, because doing so online felt more comfortable than speaking up in an all-male or mostly-male in-person environment.</p>
<p><b>Celebrate Success. Shine a Light at the End of the Tunnel.</b></p>	<p>✓ Piazza Technologies hosted a <a href="#">Silicon Valley Tech Tour for top female computer science majors</a> <sup>[8]</sup> and found many of these students, even those attending elite schools, have limited visibility into the full breadth of job opportunities available for computer science graduates. College career service departments, as well as potential employers, could do a better job of educating students about job options beyond programming, from project management to product management, which draw on technical knowledge but also tap into social and collaborative skills in a way that programming jobs don't always do. Learning about the full range of job opportunities, as well as mentorship programs which connect students to professionals, and networking events like the Grace Hopper Celebration <sup>[8]</sup>, can all help shine a light at the end of the tunnel during long, intense and sometimes lonely days of study.</p>



<sup>[10]</sup> Pooja Sankar is founder and CEO of Piazza, a student social learning and recruiting platform. She was born in India, lived in North America for 10 years, then moved back to rural India where she lived a traditional life — one which did not involve socializing with boys. Then she arrived at India's IIT to study computer science and found that almost everyone else was a boy. The genesis for Piazza and Pooja's passion for social learning came from her desire for a safe space for collaboration with her classmates. Fortunately, she went on to graduate from IIT, earn a MS from UMD, and work at Oracle, Kosmix, and Facebook. Pooja started Piazza while studying for her MBA at Stanford, where she failed a class in entrepreneurship because she was too busy running the business.

Article printed from eCampus News: <http://www.ecampusnews.com/top-news/diversity-computer-science-229/>

URLs in this post:

- [1] Studies: <https://hbr.org/product/the-athena-factor-reversing-the-brain-drain-in-sci/an/10094-PDF-ENG>
- [2] A recent study: <http://www.lifescied.org/content/13/3/453.full>
- [3] Engineering Inclusive Teaching (EIT) website: <http://www.WSKC.org/EIT>
- [4] EIT Active Learning webinar: <http://www.wskc.org/eitwebinars#puzzle>
- [5] A variety of methods: <http://www.npr.org/blogs/alltechconsidered/2013/05/01/178810710/How-One-College-Is-Closing-The-Tech-Gender-Gap>
- [6] Piazza: <https://piazza.com/>
- [7] It works: <http://chronicle.com/blogs/wiredcampus/in-stem-courses-a-gender-gap-in-online-class-discussions/55399>
- [8] Hosted a Silicon Valley Tech Tour for top female computer science majors: <https://medium.com/@piazza/hoping-to-hire-superstar-female-engineers-e461cb7e0398>
- [9] Grace Hopper Celebration: <http://gracehopper.org/>
- [10] Image: <http://www.ecampusnews.com/files/2014/12/Pooja-pic300.jpg>