

Panel: Increasing Female Enrollment and Retention for Computing Degrees

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ABSTRACT

Many technology classrooms see a disparity everyday with the numbers of men and women grossly uneven. As society realizes that more women need to be recruited into math, science and technology jobs, how do we convince young women that these are good careers for them? This panel will discuss initiatives at various universities aiming to recruit and retain female students. We hope to provoke a thoughtful exchange of ideas to help the technology field become a techie-dominated field, instead of a male-dominated field.

CCS Concepts

[Social and professional topics](#) → [User characteristics](#) → [Gender](#) → [Women](#)

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1. INTRODUCTION

“Men are better at math and science than women” was the mantra all women have heard since birth. But is that actually the case? History provides us with women who excelled at these disciplines: Madame Curie, Ada Lovelace, and Rear Admiral Grace Hopper. As society realizes that women need a seat at the math, science and technology tables, how do we convince young women that these are good careers for them? Universities worldwide have struggled with this vexing issue – how do we recruit women into these disciplines? How can we convince women to choose technology when most of their classmates are men? How do we ensure their parents that their daughters will be OK in this male-dominated major and career?

There are studies published by prestigious researchers and institutions [1] which show that all students learn better in diverse environments. Sharing different thought processes makes a better learning environment.

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And the social truth is that men in technical fields still would like to go to school with women. Many college-age men do not desire a single-sex classroom or school.

2. DAN BOGAARD, ROCHESTER INSTITUTE OF TECHNOLOGY

Rochester Institute of Technology is a private doctoral university that is internationally known for its science, computer, and engineering programs. Even still, we have struggled to bring in an acceptable percentage of female students. While there are multiple programs at RIT that are aimed at increasing female enrollment and retention (Women in Technology, Women in Science, Women in Engineering) specifically the talk will be about the Golissano College of Computing and Information Sciences specific Women in Computing (WiC) organization.

WiC was conceived in 2008 and was funded with a full time position in 2014. In 2014 the enrollment in the computing college was 9%, and in 2018 our enrollment has hit 18.4%. This success has been achieved via multiple initiatives.

The outreach initiatives have included: accepted student overnight programs; pre-orientation programs; girls soaring in STEM Fair; Girl Scout badge day; ROC Girl Hacks – Hackathon for 6-12th grades; Cyber Day for Girls (IBM Sponsored); Mobile Tech Unit; and several summer camps (Python, Security, etc).

The retention initiatives have included: WiC physical space (study, feel safe, enjoy similar interests); 8 Committees; Leadership opportunities; Weekly Social Events; Grace Hopper Celebration Conference; End of Year Recognition for active members; WiC tutoring in WiC space; Company visits; Tech talks; WiConnects – networking dinner students/faculty; and WiCHacks -24 hour innovation marathon with over 20 company sponsors and over 15 universities represented.

3. HOLLIS GREENBERG, WENTWORTH INSTITUTE OF TECHNOLOGY

Wentworth Institute of Technology, as its name eludes, is a university focused on STEM majors. As such, the university has struggled to break the 80% men to 20% women ratio of students. With a new energy on campus, different initiatives have been born to focus on both the female experience on campus and recruiting

young women into the computing and engineering fields. While many of these initiatives are still in their infancy, the hope for a more balanced campus will one day become a reality.

Initiatives at WIT focused on retaining and/or recruiting female students: Women's Council comprised completely of students; Campus Climate Committee focused on sexual harassment and Title IX issues; Women@WIT Committee focused on female student recruitment and retention, with subcommittees on social climate, internal and external marketing, retention, and women of color; Middle school and high school female student events hosted on campus; Various marketing initiatives; Women-only event held at Accepted Students Days; Women's clubs; Women's History Month celebrations; and Women's luncheon and Women@Wentworth events.

One of the biggest challenges discovered is that most students are unaware of the initiatives on campus, clubs, and other supports for women. What we have learned is to not only have these great initiatives but to also be vocal in our promotion of these initiatives.

4. KAREN JIN, UNIVERSITY OF NEW HAMPSHIRE, MANCHESTER

The University of New Hampshire (UNH) is New Hampshire's flagship public research institution enrolling over 13,000 students. UNH Manchester is the University's smallest college with over 800 students enrolled in 21 major programs and the highest proportion of students living in New Hampshire (96%). The college is also the most diverse: 37% first-generation college students, 12% students of color, 38% Pell grant-eligible students, and 90% receiving financial aid. The college has a "micro-university" character because of the disciplinary diversity of its academic programs, which include core liberal arts, business, applied and life sciences, engineering, and security studies. This disciplinary diversity also makes UNH Manchester the most gender-balanced college, with 53% women (compared to 30% in the College of Engineering and Physical Sciences and 70% in College of Life Sciences and Agriculture).

The Department of Applied Engineering and Sciences (AES) enrolled 150 students in computing, data science, and engineering technology programs. While the proportion of students of color and Pell grant eligible students is at similar levels in the AES department and college, women are only 9% of the department students. Expanding recruitment efforts to high schools removes the structural barrier of very low percentage of women in computing and engineering programs in local community colleges from which we currently recruit our engineering students. The recent launch of the B.A. in Computer Science program is another opportunity to recruit more women in the department by emphasizing the flexibility of the curriculum to pursue broader interests through more electives or a minor to explore how computations shape and impact other fields of study. Recent changes in the ABET CAC criteria increase accreditation eligibility for B.A. computing programs, dispelling the belief that a B.A. CS degree is less than a B.S. CS degree. Another recruiting effort is the department's leadership in coordinating the activities of the ME, NH, and VT affiliate of the NCWIT Aspirations in Computing program to celebrate high school female students who express

interest in computing. Starting last academic year, the department hosts the annual state-wide high school programming contest, jointly held with a CSTA NH chapter meeting that features presentations and discussions around increasing participation of NH female students in computing.

5. CHI ZHANG, KENNESAW STATE UNIVERSITY

As Georgia's third-largest university, Kennesaw State University has more than 36,000 students enrolled in Fall 2018 with an even division between male and female students, 53% - 47%. However, in the College of Computing and Software Engineering (CCSE), while the female enrollment has increased by 47% from 2015 to 2018, male students still dominate the computing student body as 81% men to 19% women. Our initiatives are built upon best practices and fostered by the leadership and faculty in the College.

The College has been promoting an inclusive learning environment by encouraging all students to participate in annual or biannual events hosted in the College - Hackathon, Computing Day (capstone and research projects showcase), Game Jam, service learning, K-12 outreach, guest speaker series, and STEM-related clubs. Industry and local school partners are closely involved in these activities. For examples: (1). WIT - Campus at KSU. Our WIT campus program addresses mentorship and leadership development - all directed by senior executive women from top companies in Georgia. NCWIT Aspiration in Computing awarded two of our students in March 2019. (2). TAPIA and NCWIT Summit on Women and IT. Faculty members are encouraged to participate in these conferences for connections and strategies for improving diversity and inclusion in computing. (3). Outreach to other majors across the University, including Arts, Education, Business, Humanities and Social Sciences, Health and Human Services. CS0 is being advocated to be part of the general education requirements for all students at KSU. (4). K-12 outreach. Researches show that interest in STEM careers should start in middle school, especially for girls. We collaborate with local school teachers and students with PowerMyLearning, Ten80, Hour of Code, Girls Who Code, Science Olympiad, and others. We hope that these activities spark interest in computing in girls and will lead to more female enrollment in the near future.

6. CONCLUSION

It is clear that there is not a magic bullet to fix the disparity of the female to male ratio in STEM majors. Traditionally, we have focused on either the non-welcoming culture within the discipline or the lack of effort institution-wide regarding diversity. [2] "We must attend to *both* STEM culture *and* institutional climate to cultivate more inclusive learning environments and increase diversity." [3]

7. REFERENCES

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