Systemic and Sustainable BPC Interventions for Undergraduate Computing Programs

Since launch in 2019, the Center for Inclusive Computing (CIC) at Northeastern University has conducted 76 site visits at large (150+ graduates) computing departments. Through these interactions, the CIC has developed a process for diagnosing the institutional barriers that prevent women from discovering and thriving in computing at the institution, and for identifying interventions for tackling those barriers that are appropriate to the institution's specific context. Possible interventions for include:

- Redesigning the introductory computing course sequence(s) to address the distribution of prior computing experience among students.
- Coordinating/synchronizing multi-section introductory courses to ensure equitable skill development for all students through common assessment (assignment/exams).
- Identifying and eliminating institutional barriers to major declaration by way of enrollment caps, high GPA entry requirements, etc.
- Designing computing in context curriculum and courses to engage students – typically through the creation of domain-specific assignments that engage students in intro computing classes.
- Adjusting degree size and requirements to do the following: i) avoid "monster degrees" (those requiring 18+ computer science classes); ii) avert excessively hard course combinations in a single semester (e.g., discrete + data structures + calc 2 + physics 2); and iii) ensuring there are workable plans of study for all students, including transfer students and students who start university needing to take pre-calc.
- Implementing inclusive practices for recruiting, training, and evaluating teaching assistants.
- Augmenting key student support structures (advising, learning or instructional assistants, TAs).
- Collecting intersectional demographic data on who is attempting, dropping, withdrawing, failing, and passing core courses (those required for majors).
- Designing interdisciplinary computing majors (CS+X) to increase attraction and promote discovery of computing.
- Designing CS0 classes and making CS0 (or CS1) fulfill a general education requirements to promote discovery of computing and increase attraction.

While these ten interventions are the focus of the CIC's work because they have been proven to work and because once they are made – generally speaking – they do not require ongoing, additional funding. That said, the CIC fully appreciates that they do not stand in isolation and that departments must engage in other connected efforts, such as building faculty buy-in, developing viable transfer pathways, and training faculty in specific methodologies such as equitable grading practices.