Gender Equity in Community College Computing Programs

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Abstract—**This poster documents the needs of community college programs and the issues they encounter as they work to improve gender equity in computing. It also describes how the National Center for Women & Information Technology (NCWIT) Extension Services (ES) Learning Circles (LC) initiative has supported these community colleges (CCs) in their efforts. Multiple data sources from the NCWIT Extension Services evaluation provide evidence that CCs need support that is designed to their varying contexts. Student background, school and NCWIT resources, and faculty and administrator buy-in all have implications for how CCs accomplish gender equity work. CC-specific tools are needed to address the needs and general structure of these predominantly two-year schools. NCWIT resources such as the self-assessment tool and student entry survey were described as helpful to the change leader teams because they provided data that informed their actions. The LC community was also helpful because it provided participants with the opportunity to learn directly from their peers. NCWIT intends to use the insight from their pilot partnership with community colleges to improve future endeavors to support gender equity work in CCs. This work may also be useful for other individuals and organizations with similar objectives.**

Keywords—gender, equity, computing, community college, learning circles, STEM

I. PREFERRED MODE OF PRESENTATION

In-person.

II. ENGAGEMENT GOALS

We seek this opportunity to share and gather feedback about our project as well as to connect with attendees doing similar work.

III. PROJECT TYPE

This project falls under (b) an educational or outreach approach, curricula, program, or initiative.

IV. PROJECT PHASE

This project is complete but unpublished.

V. RELEVANCE TO RESPECT

This pilot partnership with community colleges focuses on efforts to improve gender equity in computing education, which falls squarely within the focus of RESPECT and this year's theme of "Moving Toward Justice-Centered Computer Science Education." The partnership specifically considers experiences in community colleges, an important context that relatively little research and programs target.

I. INTRODUCTION

Since 2014, women have comprised just one-fifth of those graduating with associate degrees in computing and information systems (CIS) [1]. Due to the growth in the number of CIS associate degrees conferred to men, the proportion earned by women has diminished by more than half from 1999 levels [1]. The CIS gender gap in community colleges[1] (CCs) is particularly concerning from an equity perspective, since these institutions provide crucial access to post-secondary education, including for the socioeconomically disadvantaged, first-generation, older, and Hispanic college students they disproportionately serve [2]. However, relatively little research and programming focuses on supporting gender equity[2] within computing programs specifically within the CC context. Equipped with this information along with its goal of broadening its work beyond four-year institutions, the National Center for Women & Information Technology (NCWIT) Extension Services (ES) expanded its programming to CCs. NCWIT's relevant goals focus on recruitment and retention efforts to address the underrepresentation of women, genderqueer, and nonbinary people through its Learning Circles (LCs) initiative. This poster will share some initial related lessons that may be useful to others with similar aspirations.

Evaluation feedback suggests that the LCs broadly provide essential structure and resources for developing and implementing strategic recruitment and retention plans. To better understand how to best serve CCs in this work, this poster asks: 1) What are the needs of community colleges that are trying to advance gender equity in undergraduate computing? and 2) What NCWIT resources support their gender equity work?

II. PROJECT BACKGROUND

Launched in 2007, ES provides professional development, custom data analysis reports, guidance on evaluation, and expert consultation to undergraduate computing departments. ES's Learning Circles (LC) project provides resources and support to change leader teams (CLT) from U.S.-based institutions that are working to expand gender equity in their programs. Over the course of a year, CLTs attend monthly online meetings with other similar schools to discuss research and strategies related to recruiting and retaining women in computing. ES matches the CLTs based on similarity in institutional and program context to facilitate learning from each other's experiences. The teams also have access to the targeted support of an expert consultant as they attend meetings, assess their departmental needs, and produce a strategic recruitment and retention plan, which ES provides funding to help implement.

III. DATA AND METHODS

For this poster, we used data from surveys, interviews, and the personal reflections of computing faculty who were points-of-contact (PoC) leading their CLT. In some cases, PoCs' colleagues also shared insights through surveys and interviews. Finally, two of the PoCs from the most recent LC cohort provide structured reflections, contributing to this poster as co-authors.

IV. FINDINGS

Overall, findings show that CC change leader teams (CLTs) emphasize their unique needs and challenges, which vary not just vis-à-vis 4-year schools, but also across CCs as well. Therefore, CCs require resources and support that are tailored to their context. The teams found several resources useful, particularly the one-on-one guidance of expert ES consultants and staff, as well as a self-assessment and student entry survey, which allowed them to better understand—and convincingly communicate to their colleagues—the state of gender equity in their departments. Some teams also identified several student recruitment and retention workbooks and tip sheets as helpful in formulating their recruitment and retention plans. Finally, the CLTs unanimously reported that the gift funds NCWIT provided were helpful for implementing some of their goals. On the other hand, resources like the Tracking Tool—which schools can use to longitudinally collect and assess enrollment, attrition, retention, and completion data—were designed with 4-year schools in mind and are not yet useful for 2-year institutions.

V. CONCLUSION

This work highlights a few things about CCs. Many of these schools operate with wide-ranging resource levels and different student populations than baccalaureate schools, which results in unique needs. However, not all CCs have the same contexts and there is great heterogeneity among CCs. We must attend to the variation across CCs based on their unique populations and leadership contexts. As with any gender equity work, it is essential to understand the specific contexts before recommending interventions. This is a general tenet that works across all schools. However, there does seem to be an unmet need for CC-specific tools that take into account the general structure of 2-year schools. CCs fill an important gap in terms of computing training and re-skilling, including by providing more affordable access to higher education to socioeconomically disadvantaged individuals, who are also more likely to face other forms of marginalization. Thus, including CCs as a key partner in gender equity work and resources is essential for doing this work responsibly.

Overall, our findings support NCWIT's goals for further enhancing its work with community colleges while incorporating the following findings into its strategic priorities:

- Seek funding to facilitate larger CC-specific Learning Circle cohorts that serve different types of CCs and best match departments according to institutional similarities

- Expand the Tracking Tool to provide a mechanism for CCs to collect and analyze year-to-year gender equity data trends
- Adapt and create evidence-based resources that are inclusive of CCs
- Partner with Learning Circle CCs to engage local and regional networks to better support students from groups that have been historically underrepresented in computing
- Facilitate professional development sessions for consultants working with CCs
- Implement ES's new department chair engagement series to support Learning Circle CC chairs in gender equity work

REFERENCES

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