

Confidence in Computing: A Career Preparatory Course for Undergraduate
Students
(Technical Report)

Bridging the Gender Gap in Undergraduate Computing Programs:
A Sociotechnical Approach
(STS Research Paper)

An Undergraduate Thesis Portfolio
Presented to the Faculty of the
School of Engineering and Applied Science
In Partial Fulfillment of the Requirements for the Degree
Bachelor of Science in Computer Science

by

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Preface

For decades, demand for computer scientists has generally much exceeded the supply of computer science graduates. How can we increase interest and retention rates in the field?

Could a supplementary course with an emphasis on professional development benefit first and second-year computing students, especially those with low self-efficacy and outcome expectations? In a joint effort between UVA and UVA Wise, a group of undergraduate TAs led a one-credit course titled “Tools of the Trade” focused on teaching industry practices that may not relate directly to technical skills already incorporated in the undergraduate curriculum. Students enrolled in the course were selected on the basis of having little prior experience in computing or expressing low self-efficacy. Students were asked in a pre and post survey to indicate feelings about their skills as well as how strongly they personally identify with computer science. Data from the fall 2020 semester shows increased feelings of belonging among underrepresented groups.

In the U.S., nonprofit advocacies, employers, and universities are striving to reduce the gender gap in computing careers. Some programs have made computer science education more accessible to girls. The most effective efforts, however, reframe computer science instruction. Social factors such as exclusionary cultures within tech and male-oriented curricula are actively deterring many women from the field. Significant progress can be made by addressing and discussing these factors in CS classes and camps. Asking students to critically examine technology from a social perspective can change perceptions about computing and help girls forge more positive relationships with technology.

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