

Abstract

What is the problem in the beholder's eye? Introducing gender reforms in computer science education

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The problems of female students in computer science education can be addressed by two conceptual models, one of which is mostly used by teachers in computer science education, that is, insiders, and the other by social scientists in the field of gender and technology, that is, outsiders.

The scarcity of female students is an issue that has been addressed quite frequently in conferences dedicated to computer science education, using a model which is based on the perceived differences between male and female students. These studies take as their starting point results of earlier research, showing, for example, that female students have lower self-confidence, less previous experience of computers, a more cooperative working style and wider interests than male students. The studies normally report results of different intervention projects aimed at modifying computer science education to better suite this kind of students, or they continue mapping the differences between students of different categories (gender, race and ethnicity), to better understand and, thus, to better address different student groups.

There are comparatively few studies conducted according to the other conceptual model, where differences between students are not the starting point. This kind of research has mainly been done by social scientists, for example scholars in gender and technology studies. This research investigates the epistemological and disciplinary culture of computer science, which are mirrored in the educational content and methods of computer science programs, and the forms of masculinity and feminity which are mirrored in the daily interactions in the environment. According to this view, the issues addressed by the difference model are symptoms of something that is much more complex and deep-set, and, consequently, more difficult to change.

The differences between these two explanatory models can cause problems, when gender researchers are employed as change agents in computer science higher education. The cultural view, and the research it is based on, is unknown and unfamiliar to computer scientists. In addition, adopting the cultural view means that change projects should not only deal with students and limited parts in the professional life of the academic staff, but require a reappraisal of the whole intellectual and social environment of the education, which is much more difficult to do. However, the repeated failures of computer science education in making, and particularly in sustaining, substantial educational reforms with a gender equality ambition, indicate that working also with the cultural view and making more deepgoing changes may be necessary.

The paper elaborates the culture based model, based on previous research. Further, both previous research and practical experience are used to explore ways of bridging the gap between the two models, in efforts of improving computer science education.