

Book Review

Stuck in the Shallow End: Education, Race and Computing by Jane Margolis with Rachel Estrella, Joanna Goode, Jennifer Jellison Holme and Kimberley Nao, MIT Press, 216 pp., \$24.95, ISBN 0262-13504-7

Seven years ago, Jane Margolis and Allan Fisher published ‘Unlocking the Clubhouse’ (2002), a landmark study of the reasons why a disproportionately small number of women in the United States study computer science. As part of the study, Margolis and Fisher identified some of the strategies that can be employed to change this situation and documented how these strategies were employed to considerable success at Carnegie Mellon University in the late 1990s. In *Stuck in the Shallow End*, Margolis turns her attention to the case of African American and Latino students who, in the United States, are a similarly under-represented population in computer science.

The book is the outcome of a study that began in 2000 and which concentrates on three, rather different high schools in Los Angeles. Despite the differences between the schools, and, in particular the student demographics of the schools, the results of the study show that across all three schools minority students simply do not get the same learning opportunities. Instead, the more advanced coursework is systematically made available to those students who, because of the opportunities that they already have outside school, are less in need of it. This, of course, reinforces the status quo and maintains a barrier that even the best and most enthusiastic minority students find it hard to overcome—the book contains a number of examples where enthusiasm for computer science was effectively killed by the system that should have encouraged it.

One of the myths about increasing the number of students who study technology-related subjects is that it is access to the technology that is important. Bridge the ‘digital divide’ by increasing the number of computers in schools, the argument goes, and you will find that any disparities between different ethnic or socio-economic groups will disappear. Sadly this does not seem to be the case. Simply putting computers in schools does not necessarily improve access, and there are a number of reasons why this is so. For a start, unless the machines are maintained, the number that work quickly decreases, and the budget to prevent this is often not met by school districts—it seems to be much easier to find money for new equipment than a salaried position to maintain it. Then there is the fact that even when the computers are working, students do not necessarily get much time to use them. A common arrangement, which at first glance seems to increase access to the technology, is to group all the machines in one or two computer rooms rather than to spread them out through the school. That way, the thinking goes, they are available to any class that wants to use them. In practice, this arrangement means that a class that is going to use the machines has to spend ten minutes at the beginning and end of each lesson trooping to and from the computer room (and ten minutes is low estimate as anyone who has tried to herd a group of high-school students will testify), a lot of time to lose from a forty minute lesson. Finally, there is the curriculum, which at high school level often concentrates on teaching little more than glorified clerical work—how to use a wordprocessor or spreadsheet—rather than anything stimulating or creative. When there are more advanced classes, they can often be dominated by students who have access to computers at home and who already have knowledge that intimidates students who have less familiarity with technology (a situation very familiar to those who have read *Unlocking the Clubhouse*).

Happily, it is possible to push back against the status quo, and *Stuck in the Shallow End* documents some of the ways in which this can be done. By offering training to teachers who wanted to teach computer science—specifically at the “Advanced Placement” level, which allows

the course to count against requirements at university level and which is therefore attractive to students bound for higher education—but were unable to do so, Margolis and her colleagues managed to quickly create more opportunities for students to study computer science at an advanced level. By ensuring that this training was ongoing, and thus provided a focal point, it was possible to create a community of computer science teachers, overcoming the isolation that is a consequence of schools typically having at most one computer science teacher. This training for teachers was then supplemented by engaging education administrators so that more resources were directed to teaching computer science, helping to ensure that the courses teachers were being trained to teach were actually offered. This program was very effective in increasing enrollment in high-school computer science.

Such a high profile approach is not the only way to address the problem. One of the most striking aspects, to me, of both *Unlocking the Clubhouse* and *Stuck in the Shallow End* is the extent to which very simple strategies can be deployed to improve the current situation. In both cases the status quo—which has computer science classes at both school and university level dominated by white men—can easily be intimidating to students who don't fit that profile. Simply working to make women and minority students feel welcome in the classroom, to adapt course materials so that the work feels directly relevant to them, and to help them be confident that they have the skills to succeed in the subject can make all the difference. These are not hard things to do, but they do involve time, in particular time to think about how to do these things, and time to change the current organization in order to accommodate them. Scheduling pressures tend to make time a scarce commodity in both schools and universities—it certainly is in every school and university I know—but the potential payoff of using some of that precious time to do the simple things that encourage underrepresented minorities to stick with computer science are so huge that I can think of no better way to spend it.

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Reference

Margolis, J. & Fisher, A. 2002. *Unlocking the Clubhouse: Women in Computing*. MIT Press.