Fostering integration of research with education

As a teaching assistant this quarter for CSE 134A: Web Server Languages, an upper-division undergraduate course at UCSD, I have encouraged students to consider complex questions such as what makes a speech interface good or bad. The third assignment is to implement a service that collects news from Web sites and makes it available by telephone. I pointed the students to a research paper called “Designing SpeechActs: Issues in Speech User Interfaces” by Nicole Yankelovich and others. Good interface design is a major focus of the course.

As Professor Elkan has conceived it, the spirit of CSE 134A is embodied by open-ended projects with ample room for creativity and innovation. I have tried to motivate students to probe beyond the specifications, to decide for themselves what their projects should be and why. Part of each project is to write a report justifying the decisions they made; I often suggest they take advantage of this and really think for themselves. In my view, self-motivated, independent thought put into a project and described clearly in a written report has the most important trappings of research.

Advancing diversity in science

Diversity is an important, and a major challenge for a discipline as overwhelmingly male as computer science and engineering. Though I can’t claim any credit for their successes, I have supported women in computer science. At the University of Utah I encouraged my friend Jennifer Stauffer to become an officer in our Utah Alpha chapter of Tau Beta Pi, a national (and recently international) engineering honor society. Fortunately she took on this role; it’s important for people to see women in leadership positions within engineering.

I am also lucky to have had an outstanding woman, Professor Cynthia Thompson, as my first research advisor when I was an undergraduate at the University of Utah. I can’t fairly count this as an example of my having advanced diversity, but I favor and welcome women in my field.

The first graduate student I ever worked with, David Price, is blind. My interaction with him raised my awareness of how persons with impaired vision are excluded by many interface designs, especially on the World Wide Web. I specifically try to make everything I publish on the Web as accessible as possible, and I advocate others doing the same.

Enhancing scientific and technical understanding

I see many ways to promote scientific and technical understanding within our broader community. Perhaps the most important is good teaching, the kind that motivates students not only to learn but also to share their knowledge with others. Many teachers have done this for me; I hope I to do it now as a teaching assistant and in the future as a professor.

One can also enhance broader understanding by writing scientific and technical material for a general audience. Donald Norman’s books are exemplary in this regard. Reading The Design of Everyday Things will enlighten anyone about how interface design can make things much easier—or harder—to use. This knowledge is empowering, especially when one recognizes poor designs oneself. Suddenly instead of subtly taking the blame for making mistakes, one realizes the mistakes are often facilitated by poor designs. I aspire to think and write with clarity and vision like his.

Benefiting society

Practically by definition, teaching benefits society by helping individuals achieve their potential to contribute value in whatever they choose to do.

Research also benefits society directly through the development of technologies that make people’s lives easier and more productive. My research plan, in one particular way, aims to do this. David Price’s research in natural language programming is intended not only to help people with impaired vision, but also to help anyone learn how to program by allowing them to describe a procedure verbally, naturally, at a high level of abstraction. One group who will benefit from this is students in introductory programming classes; this was part of the original motivation for the work, and the reason we submitted our paper to Frontiers in Education.