the secret life of engineering education researchers

my research ...or “what this poster is not about”

My research questions are motivated by the growing gender gap in undergraduate computer science, especially because freshman interest in the field is dropping at an alarming rate.

What are introductory CS students’ perceptions of computer science?
What aspects of the CS major do they find attractive/unattractive?
How can we adapt intro CS courses to reach a broader audience?

Please see these publications for preliminary findings:

risk-taking ...or “what this poster is about”

There are many struggles and joys in undertaking engineering education research, especially as a graduate student. Conventional presentations of research focus on theory, methods, data, analyses and implications…but what’s the story behind the story?

What struggles do new engineering education researchers face?
What strategies do they employ to succeed?
What joys motivate them to persist?

life before the institute ...or “how my research almost never happened”

1998 Completed my Bachelor’s degree in computer science and was immediately plunged into the challenges of teaching introductory computer science as a first-year grad student. Ended up loving it!

2000 Finished my Master’s work in a safe, conventional area of computer science. Almost left the program, more sure than ever of my interests in teaching and learning. Feeling increasingly beaten down by life in a big, research university.

2001 New group forms within department to give computer science education a proper, scholarly treatment. My now-advisor surprises me by approving gender/attrition as my dissertation topic.

2002 Analyzed a set of computer-science specific studies of gender/attrition studies to fulfill requirements for candidacy. Struggled to find advisable, support and time for my research, relying heavily on teaching assistantships and funding from outside the department.

2004 Became an Institute Scholar with the CAEE Institute for Scholarship on Engineering Education and got a chance to focus on my work. Collected tons (N=350) of survey data and conducted a preliminary set of five interviews, with more planned for this winter.

the struggles...and strategies

I’m not a social scientist, but getting the background I need has been surprisingly easy. Sure, survey design and interview analysis are hard, but there are books on that, and FIE is a great place to get advice. The real struggles are the ones there aren’t books for.

Proper care and feeding. Risky work requires support—not just funding and a desk, but a reliable source of feedback, advice, and encouragement. If you’re really lucky, you’ll find that in one, nice package: Super Advisor! I’ve learned to find different kinds of support from different people, looking beyond my department and my campus.

This takes initiative, patience, and discipline. With funding, making time for your own dissertation while working as an RA for another department is a tough balancing act.

Teaching your way through a doctorate can be even tougher, if you really care about your students. Reserving a substantial block of time daily is my current strategy.

Sources of feedback, advice, and encouragement can be even harder to come by than funding. I wouldn’t survive without my grad colleagues, faculty outside the department, and friends from the ASEE and SIGCSE communities.

Relax, it’s only a dissertation. For me, graduation is Job One. It’s especially important for doctoral research to be carefully focused and limited in scope. “How about race/ethnicity?” Yes, in my next study. “How about a multi-institutional study?” After I’m faculty, thank you.

While I hope my findings can inform or even facilitate local change, that sort of impact is not my primary goal. From years of departmental service, I’ve grown to appreciate that research like mine is one, small piece of the puzzle, especially when cultural change is called for.

the joys

Learning across disciplinary boundaries. Exposure to new methods, theories, and perspectives keeps things exciting and helps the teacher in me keep in touch with the experience of learning new things.

More data, please. Qualitative data can be rich, complex, and full of insights waiting to be discovered. Learning how quantitative and qualitative data can complement each other has been fascinating. Caution: Research this fun may be habit-forming.

Head–heart alignment. Working on questions I really care about is worth every struggle, especially when it means having...

...a supportive, friendly community I can call home. Conferences like this are my life line. It’s people like Lecia Barker, Kathy Garvin-Doxas, Robin Adams, Cindy Atman, and Joanne Cohoon who inspire and encourage me. Thanks!

Speaking of thanks, this material is based on work supported by the National Science Foundation under Grant No. ESI-0227538, which funds the Center for the Advancement of Engineering Education (CAEE). Any opinions, findings and conclusions or recommendations expressed in this material are those of the author and do not necessarily reflect the view of the National Science Foundation.