Thoughts on Outreach

Mike Spear
Computer Science and Engineering
Lehigh University
“Reflect that in reality you have a greater need to serve than they have of your service.”

– Angela Merici
Where To Do Outreach?

• If you haven’t been in a public school since you received your PhD, you aren’t doing outreach

• We need more kids who want to pursue STEM careers
  – You can’t reach them unless you go to them
  – If you’re not reaching them, your outreach is low-impact
What Topics Should Your Outreach Cover?

• Bad: your research, lecture format, theoretical stuff

• Good: interactive, hands-on stuff they can do, understand, and appreciate,
  – But that they can’t do anywhere else

• Remember: the goal is to make them want to fill the STEM pipeline
  – Not necessarily even in your field
  – You are building relationships
  – “When I grow up I want to be …”
Key Attributes

• Outreach must be sustainable
  – A one-time outreach activity:
    1. Has a high fixed cost
    2. Doesn’t inspire kids, because it lacks follow-up
    3. Doesn’t impress the NSF (see #1 and #2)

• Outreach must be good
  – High-energy, hands-on, fun
  – Something they won’t get in the classroom
  – You don’t have to invent it yourself
  – Maybe you can incorporate things you already do
  – Bring undergrads to help you
Sustainability Is Worth It

• ~40 hours to prepare and execute a good program
  – 2% of your work-year if you only work 40 hours per week
  – My suggestion: spend the time supervising undergrads who build the program and participate in it

• Then ~12 hours to do it the next year
  – Prep time + actual events

• You are building a relationship, not a bullet point
• I live close to an elementary school
  – Contacted kindergarten teacher about doing a 1-hour presentation about robots (using robots that an undergrad made as a first-year project…I’m not a roboticist)
  – 24 kindergarten kids
  – 1 hour of hands-on interaction and conversation
  – Brought 3 students with me
  – Split kids into 4 stations
  – It was exhausting, but fun
My Outreach Story (2013)

• Did the same thing, but for two classes in the same day
  – Twice as much impact
  – Two hours of work (plus some effort to get robots running again… maybe 10 hours total)

• Learned that the school was starting an after-school enrichment program in the fall
  – Volunteered to do a 6-week course (1 hour/week)
  – Simple stuff… taking a computer apart, playing with hardware, intro to programming concepts, robots (of course), intro to algorithmic thinking
  – 1st-5th grade
• BASD will be offering an engineering curriculum in its high schools starting this fall

• Invited identified 8th graders to a campus event I was hosting anyway (mobiLEHIGH)
  – I ran a 30-minute session about game programming
  – 10-minute talks by guests from Microsoft, Yahoo!, and Google
  – 60 minutes playing video games written by Lehigh students, voting for their favorite
  – 30-minute Q&A with undergrads about college
  – Bought a lot of cookies and soda, paid for a bus
You can’t just walk into a random school and volunteer

– Some schools don’t have established outreach activities… they need more than you can do
– Some schools have expensive outreach activities… they just want to pay DSC and others

You want the stuff that falls in between

– See me for info about how to sign up for a 6-week program in the fall at a public K-5 school
  (spear@lehigh.edu)
– You can limit how many students, what grades
Selfish Motivations for Good Outreach

• You want to have high-impact, sustainable outreach *that doesn’t take long to explain*
  – Outreach isn’t the focus of your CAREER proposal
  – One or two strong paragraphs plus a link to a website

• Past/present tense is better than future tense
  – It’s like “preliminary work” in the research sections
  – Gives the reviewer confidence that you’ll succeed

• It makes you a better researcher and educator
  – Can you (and a few undergrads) excite 4th graders about your field?
“Reflect that in reality you have a greater need to serve than they have of your service.”

– Angela Merici