Education Research
Ed Research and Teaching communities are disjoint

• Teachers traveling to conferences
  – Time & resources are scarce
  – Researchers and teachers travel to different conferences

• Learning progression on CS
  – Not known
  – No agreement

• Universities value research, and not teaching
Ed Research and Teaching communities are disjoint

- Recommendations
  - CS departments should proactively partner with Ed departments

- Benefits
  - Strong curricula
  - Improved retention

- Challenges in CS departments
  - High dropout rate in CS 0 and CS 1 courses
High school vs. college

• CS teaching in high schools very different
  – Non interactive lengthy lecturing does not work in high schools
  – CS 1 in high school has to appeal to broader student demographic / not just future CS majors
  – Computing more important than programming

• Collection of pre-test / post-test student knowledge in CS classes could help improve teaching
• Asking students to collect questions as they read / work on homework
  – Helps ensuring that questions are addressed in following lecture
• Teaching methods specific to or tuned for CS should be the focus of CS education research
• Reasons students drop college intro CS
  – Surprised by content
  – Not interested
• High school challenges
  – No dropping of CS course
  – Competition with other electives / AP courses
  – CS courses considered impossibly demanding (“4 hours of homework”)
  – Teachers need to be good story tellers
  – Teachers should focus on big picture as opposed to focusing on details
  – Pre-req to APCS is not rated (doesn’t count much towards GPA)
• Ed research challenges specific to CS
  – Debugging
• What are misconceptions regarding CS
  – Common mistakes
  – Myths
• Platform independence
  – SW, HW
• Teaching CS w/o programming
  – No programming language details
  – AP CS Principles course seems too dependent on programming (from presentations)
  – How do we teach the other 6 principles
  – Is programming equivalent to rigor?

• Teaching CS w/o computer
  – Doesn’t work: Students lose interest
• Data leads to knowledge
  – Difficult to process data w/o actual computers