A View of Alternative Entry Experiences from Social Science and Educational Research

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Overview

• Where do your students come from?
• Experience, classroom climate, meaningful assignments, collaborative learning
• Comments on pair programming, alternative introductory classes
Getting Them In the Door: Recruitment Strategy

- Set Goal
- Identify Target Audience
  - Low-Hanging Fruit
  - Unaware Fruit (Grow Your Audience)
- Leverage Points: External and Internal Assets
- Contact Strategy
- Timing
- Evaluate ➔ Share ➔ Improve
Average CS Faculty Member Opinion

Prerequisites for students to begin CS course work

- Precalculus math
- Discipline
- Basic computing skills
- Logic/critical thinking
- Inquisitive nature
- Science courses
- Communication skills
- Commitment/attitude
- Problem solving ability
- Maturity

Source: Jesse 2006
College-Bound Senior Intended Majors

Mean SAT M:

- CS/Info Sci: 535
- Engr: 579
- Math: 628
- Phys. Sci.: 591
- Undecided: 530
- Business: 558
- Bio. Sci: 552
- Lang & Lit: 552

Source: College Board 2005 College Bound Seniors
Traditional CS1 as Entry Barrier?

- Teaches to the middle: students with programming experience
- Often uses the “747” of programming languages
One Class Fits All?

Programming Experience → Confidence, Academic Success

Loss of Confidence, Perception of Inability → Switching Major

Source: Cohoon & Aspray, 2006
Learning: A Social Accomplishment

- Learning is situated in and becomes meaningful as a result of social and cultural practices¹

- Students discover whether they belong
  - interaction with peers, faculty
  - academic outcomes

Classroom Climate Issues in CS1

- Isolating, individualistic, impersonal
  - Fear of cheating
  - Fear of exposing weakness
  - Unrestrained outspoken students
  - Experienced students described as “smart”

- Professors’ talk about what is “interesting”

- Overdependence on lecturing, beginning with the abstract

CRA Conference at Snowbird  
June 27, 2006  
Barker & Garvin-Doxas, 2004
Meaningful Assignments, Examples

- Learning must be personally meaningful
- Find out what is interesting to your students
Collaborative Learning Environments

- 100 years of research on learning: more positive than negative\(^1\)
- Peer mentoring built in
  - Students hear each other articulate what they are learning
  - Development of academic support system
- Make informed decisions about belonging
- Comfort in social setting

\(^1\)Dillenbourg, Baker, Blaye, & O’Malley, 1996
Appeal of Media Computation, Alice

- Meaningful assignments, related to aspects of the world students know about
- Inexperienced students gain experience among their inexperienced peers
- Increases confidence, realistic assessment of ability
Appeal of Pair Programming

• Peer support
• Hear other students articulate concepts
• Active learning with a partner
• Increases confidence, realistic assessment of ability