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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

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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

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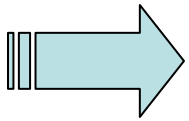
Average CS Faculty Member Opinion

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

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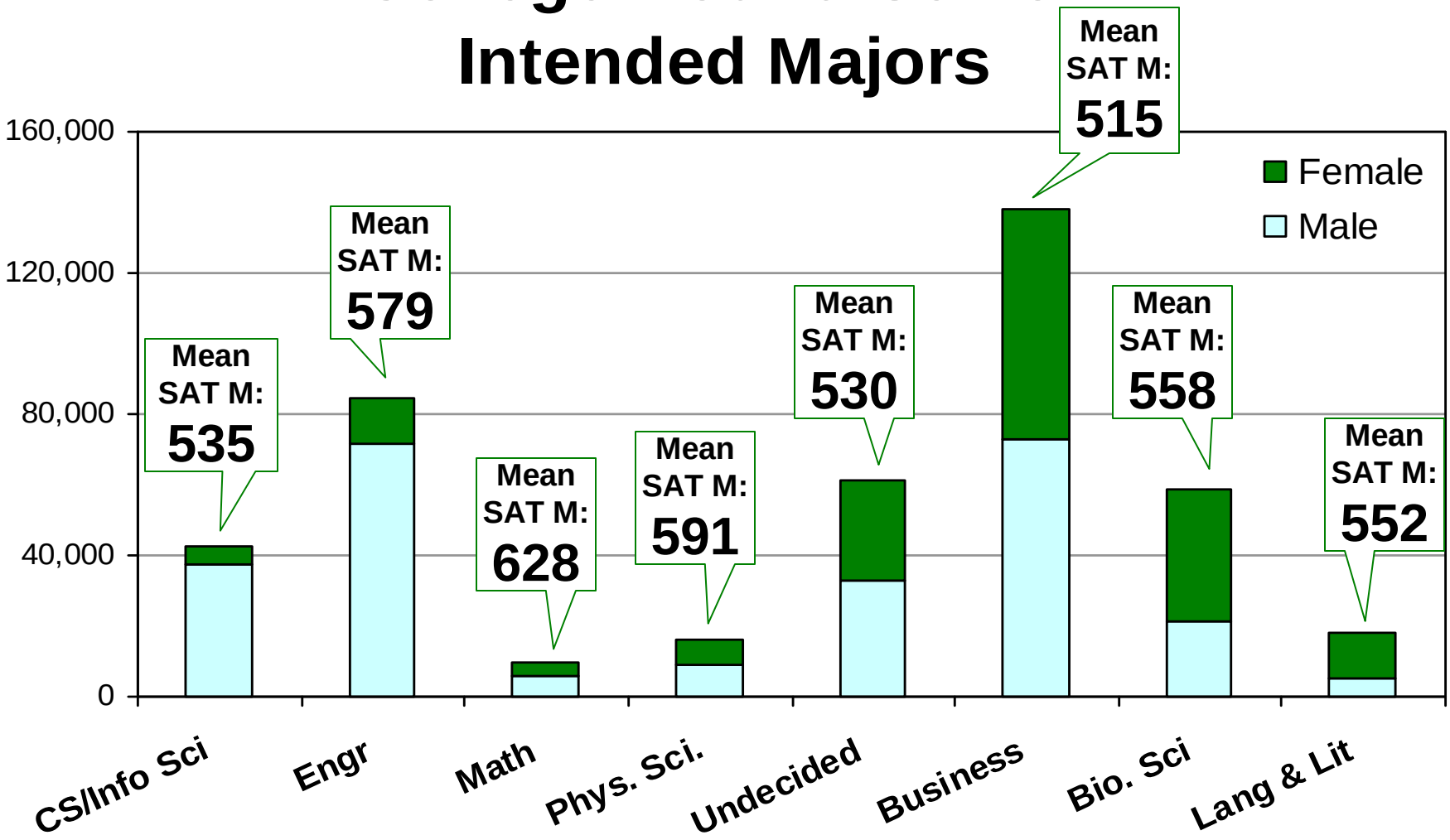
College-Bound Senior Intended Majors



Source: College Board 2005 College Bound Seniors

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Traditional CS1 as Entry Barrier?

- Teaches to the middle: students with programming experience
- Often uses the "747" of programming languages

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One Class Fits All?

Programming Experience → **Confidence, Academic Success**

Loss of Confidence, Perception of Inability → **Switching Major**

Source: Cohoon & Aspray, 2006

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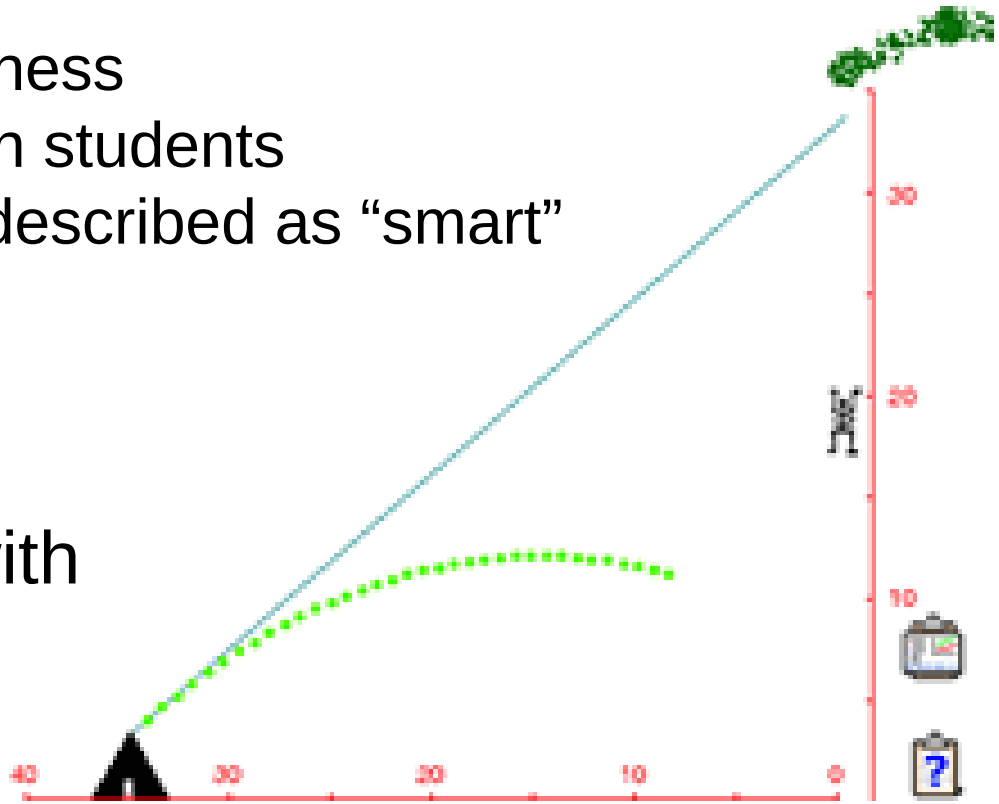
Learning: A Social Accomplishment

- Learning is situated in and becomes meaningful as a result of social and cultural practices[1]
- Students discover whether they belong
  - interaction with peers, faculty
  - academic outcomes

[1]Wertsch, 1985, 1991; Cole, 1985, 1996; Brown and Reeve, 1987; Coll, 1990; Lave, 1991

Classroom Climate Issues in CS1

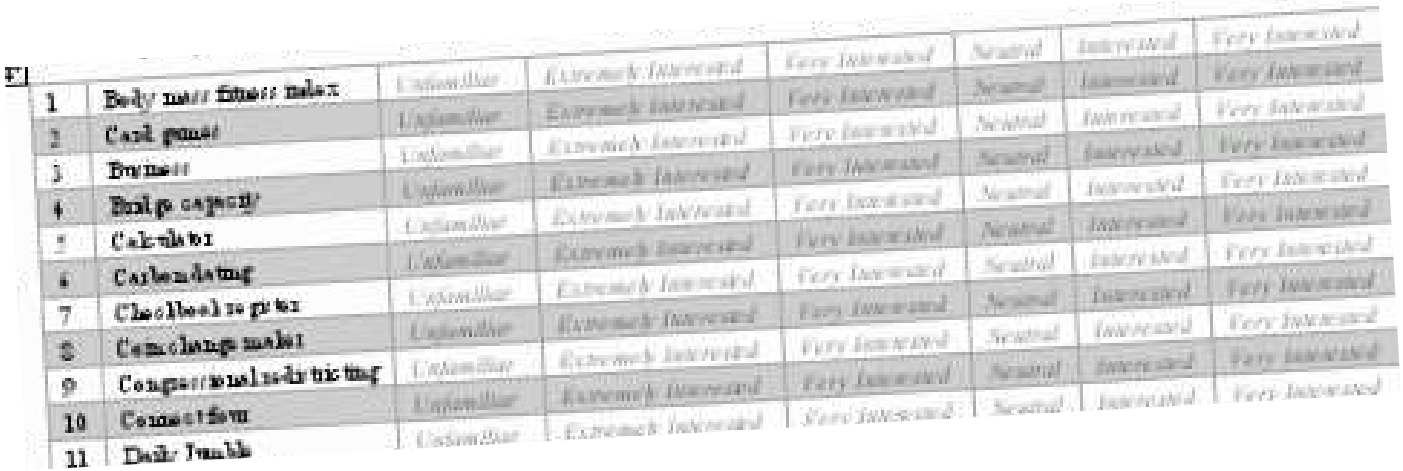
- Isolating, individualistic, impersonal
  - Fear of cheating
  - Fear of exposing weakness
  - Unrestrained outspoken students
  - Experienced students described as “smart”
- Professors’ talk about what is “interesting”
- Overdependence on lecturing, beginning with the abstract



Barker & Garvin-Doxas, 2004

Meaningful Assignments, Examples

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



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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

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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

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Appeal of Pair Programming

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