The research university

• Boyer report
  – Undergraduate education at research universities

• Problem
  – Research is separate from teaching
  – Passive learning

• Proposed solution
  – Inquiry-based learning (research)
  – Collaborative experience
  – Practice in communication (writing, speaking)
More from the Boyer Report

• Common goals
  – Investigation
  – Discovery
  – Creativity

• Skills to develop
  – Problem-solving, logical thinking
  – Communication (writing, speaking)
    • Goals: clarity, brevity
    • Convey results to all levels
  – Collaboration
    • Teamwork
    • Diverse, interdisciplinary perspectives
Research

Research is “the search for knowledge” (Wikipedia)

A systematic investigation to:
• Discover (explore, observe)
• Solve problems
• Develop theories

Scientific research relies on the scientific method
Scientific method

• Ask question (problem)
• Gather background information
  – Cite prior work
  – Don’t repeat mistakes
• Construct hypothesis (solution)
• Test hypothesis
  – Design, perform experiment
  – Collect data (qual, quant)
• Analyze data, draw conclusions
• Report results
Research tips

• Build on existing knowledge
• Get feedback from peers
• Fail early, fail often
  – Learn from analyzing failure then try again
  – Rapid prototyping
• “Always deliverable” (XP)
  – Develop incrementally
• Urgent v. important

Steven Covey, *The 7 Habits of Highly Effective People*
CSE 118 projects

• Groups
  – 2-4 people
  – Interdisciplinary teams encouraged

• Empirical (experimental)

• Some examples
  – Build prototype, evaluate system’s performance
  – Build prototype, evaluate users’ experiences
  – Observe current practices, inform future design
Required components

• **Proposal** (30% of project grade = 15% of course grade)
  – Draft milestones
  – Written proposal (1-3 pages, including bib.)
  – Short in-class presentation

• **Final presentation** (70% of project grade = 35% of course grade)
  – The project and its results
  – Longer in-class presentation
  – Peer assessments
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<tr>
<th>Week 1 (suggested)</th>
<th>Form groups</th>
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<td>Wednesday, 9/28</td>
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<tr>
<th>Week 3</th>
<th>Motivation and claim (draft)</th>
<th>Turn in written draft</th>
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<td>Wednesday, 10/12</td>
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<tr>
<th>Week 4</th>
<th>Related work and bibliography (draft)</th>
<th>Turn in written draft</th>
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<td>Wednesday, 10/19</td>
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<tr>
<th>Week 5</th>
<th>Research questions(s) and solution approach (draft)</th>
<th>Turn in written draft</th>
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<td>Wednesday, 10/26</td>
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<tr>
<th>Week 6</th>
<th>Proposal</th>
<th>Short presentation; turn in written proposal</th>
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<td>Wednesday, 11/2</td>
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<tr>
<th>Finals week</th>
<th>Final presentation</th>
<th>Extended presentation; turn in supporting materials and peer assessments</th>
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<td>Tuesday, Dec. 6,</td>
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<td>11:30am-2:30pm</td>
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Resources, inspiration

• Class website, department website
• Department seminars
  – Ubicomp (Tuesday, 3:30pm, CSE 3119) – Bill Griswold
  – DCOG (Wednesday, 10:30am) – Jim Hollan, Ed Hutchins
• Conference proceedings
  – Ubicomp, Pervasive, CHI, UIST, CSCW, MobileHCI
• Author websites
• Google scholar (scholar.google.com)
• ACM digital library (dl.acm.org)
Exercises

• Example project ideas?
• Introductions
  – Name, major, goals / plans
  – Project ideas and interests (general or specific)
    • Topics
    • Methods
    • Tools
• Brainstorming