TODAY’S DISCUSSION

- Welcome and Introductions
- Course Redesign Overview (1 hour)
- Q and A Session (15 minutes)
- What’s Next? (30 minutes)
Established in 1999 as a university Center at RPI funded by the Pew Charitable Trusts

Became an independent non-profit organization in 2003

Mission: help colleges and universities learn how to use technology to improve student learning outcomes and reduce their instructional costs
WHAT DOES NCAT MEAN BY COURSE REDESIGN?

Course redesign is the process of redesigning whole courses (rather than individual classes or sections) to achieve better learning outcomes at a lower cost by taking advantage of the capabilities of information technology.
A WORD ABOUT TERMINOLOGY

- A “course” is analogous to a “subject” (at James Cook University) or a “unit” (at the Australian Catholic University) of one or two semesters in duration—-not an entire degree or major.
PROGRAM IN COURSE REDESIGN

Challenge colleges and universities to redesign their approaches to instruction using technology to achieve quality enhancements as well as cost savings.

50,000 students
30 projects
QUANTITATIVE (13)

- Mathematics
  - Iowa State University
  - Northern Arizona University
  - Rio Salado College
  - Riverside CC
  - University of Alabama
  - University of Idaho
  - Virginia Tech

- Statistics
  - Carnegie Mellon University
  - Ohio State University
  - Penn State
  - U of Illinois-Urbana Champaign

- Computer Programming
  - Drexel University
  - University at Buffalo
SCIENCE (5)
SOCIAL SCIENCE (6)

- Biology
  - Fairfield University
  - University of Massachusetts

- Chemistry
  - University of Iowa
  - U of Wisconsin-Madison

- Astronomy
  - U of Colorado-Boulder

- Psychology
  - Cal Poly Pomona
  - University of Dayton
  - University of New Mexico
  - U of Southern Maine

- Sociology
  - IUPUI

- American Government
  - U of Central Florida
HUMANITIES (6)

- English Composition
  - Brigham Young University
  - Tallahassee CC
- Spanish
  - Portland State University
  - University of Tennessee
- Fine Arts
  - Florida Gulf Coast University
- World Literature
  - University of Southern Mississippi
IMPROVED LEARNING OUTCOMES

- Penn State - 68% on a content-knowledge test vs. 60%
- UB - 56% earned A- or higher vs. 37%
- CMU - scores on skill/concept tests increased by 22.8%
- Fairfield – 88% on concept retention vs. 79%
- U of Idaho – 30% earned A’s vs. 20%
- UMass – 73% on tougher exams vs. 61%
- FGCU - 85% on exams vs. 72%; 75% A’s and B’s vs. 31%
- USM - scored a full point higher on writing assessments
- IUPUI, RCC, UCF, U of S Maine, Drexel and U of Ala - significant improvements in understanding content

25 of 30 have shown improvement;
5 have shown equal learning.
COST SAVINGS RESULTS

- Redesigned courses reduce costs by 37% on average, with a range of 15% to 77%.
- Collectively, the 30 courses saved about $3 million annually.
WHAT HAPPENS TO THE SAVINGS?

- Stay in department for continuous course improvement and/or redesign of others
- Provide a greater range of offerings at upper division or graduate level
- Accommodate greater numbers of students with same resources
- Stay in department to reduce teaching load and provide more time for research
- Redesign similar courses
- Miscellaneous
  - Offer distance sections
  - Reduce rental expenditures
  - Improve training of part-time faculty
TAKING COURSE REDESIGN TO SCALE

- **The Roadmap to Redesign (R2R)**
  2003 – 2006 (20 institutions)

- **Colleagues Committed to Redesign (C2R)**
  2006 - 2009 (60 institutions)

- **Programs with Systems and States**
  2006 – present (~80 institutions)

- **The Redesign Alliance**
  2006 – present (70+ institutions)

- **Changing the Equation**
  2009 – 2012 (38 institutions)
QUANTITATIVE

- Mathematics
  - Developmental Math
  - Pre-calculus Math
  - College Algebra
  - Discrete Math
  - Introductory Algebra
  - Elementary Algebra
  - Beginning Algebra
  - Intermediate Algebra
  - Linear Algebra

- Statistics
  - Business Statistics
  - Introductory Statistics
  - Elementary Statistics
  - Economic Statistics

- Computing
  - Computer Programming
  - Information Technology Concepts
  - Computer Literacy
  - Information Literacy
  - Tools for the Information Age
• SCIENCE
  - Anatomy and Physiology
  - Astronomy
  - Biology
  - Ethnobotany
  - Chemistry
  - Geology

• SOCIAL SCIENCE
  - American Government
  - Macro and Microeconomics
  - Psychology
  - Sociology
  - Urban Affairs
• HUMANITIES
  - Developmental Reading
  - Developmental Writing
  - English Composition
  - Communication Studies
  - Understanding the Visual and Performing Arts
  - History of Western Civilization
  - Great Ideas in Western Music
  - Spanish
  - World Literature
  - British Literature
  - Women and Gender Studies

• PROFESSIONAL
  - Elementary Education
  - Education: The Curriculum
  - Engineering Technology
  - Organizational Behavior
  - Public Speaking
  - Accounting
  - Nursing
120 REDESIGNED COURSES

- 160,000 students nationwide
- Improved student learning: 72%
- Equivalent student learning: 28%
- Cost reduction: 37% (9% to 77%)
  Annual savings: ~$9.5 million
- Other outcomes
  - Increased course-completion rates
  - Improved retention
  - Better student attitudes toward the subject
  - Increased student satisfaction with the mode of instruction
NCAT METHODOLOGY: Relevance and Utility

- **Discipline**: math & literature
- **Age**: traditional & working adults
- **Institution**: small & large
- **Location**: on-campus & at a distance
- **Redesign**: current & new courses
- **Level**: introductory & advanced
REDESIGN CHARACTERISTICS

- Redesign the whole course—not just a single class
- Emphasize active learning—greater student engagement with the material and with one another
- Rely heavily on readily available interactive software—used independently and in teams
- Mastery learning—not self-paced
- Increase on-demand, individualized assistance
- Automate only those course components that can benefit from automation—e.g., homework, quizzes, exams
- Replace single mode instruction with differentiated personnel strategies

Technology enables good pedagogy with large #s of students.
SIX REDESIGN MODELS

- **Supplemental**: Add to the current structure and/or change the content
- **Replacement**: Blend face-to-face with online activities
- **Emporium**: Move all classes to a lab setting
- **Fully Online**: Conduct all (most) learning activities online
- **Buffet**: Mix and match according to student preferences
- **Linked Workshop**: Replace developmental courses with just-in-time workshops
GENERAL BIOLOGY at Fairfield University

- Inconsistent student academic preparation
- Inadequate student interaction with learning materials and complex topics
- Inadequate use of modern technology
- Inability of students to retain what they have learned (amnesia)
- Inability of students to apply biological principles to other disciplines (inertia)

- Memorization vs. Application of Scientific Concepts
ACADEMIC GOALS

- Enhance quality by individualizing instruction
- Focus on higher-level cognitive skills
- Create both team-based and independent investigations
- Use interactive learning environments in lectures and labs
  - to illustrate difficult concepts
  - to allow students to practice certain skills or test certain hypotheses
  - to work with other students to enhance the learning and discussion of complex topics
Traditional
- 7 sections (~35)
- 7 faculty
- 100% wet labs
- $131,610
- $506 cost-per-student

Redesign
- 2 sections (~140)
- 4 faculty
- 50% wet, 50% virtual
- $98,033
- $350 cost-per-student

✓ Content mastery: significantly better performance
✓ Content retention: significantly better (88% vs. 79%)
✓ Course drops declined from 8% to 3%
✓ Next course enrollment increased from 75% to 85%
✓ Declared majors increased by 4%
FIRST-YEAR SPANISH (Replacement Model)

- Increase active speaking via in-class interaction
- Use technology to support skill practice
- Provide immediate feedback online
- Increase student and instructor computer literacy
- Encourage collaborative learning, both online and in class
Traditional
- 57 sections (~27)
- Adjuncts + 6 TAs
- 100% in class
- $167,074 ($2931/section)
- 1529 students @ $109

Redesign
- 38 sections (~54)
- Instructor-TA pairs
- 50% in class, 50% online
- $56,838 ($1496/section)
- 2052 students @ $28

✓ Oral skills: significantly better performance
✓ Language proficiency & language achievement: no significant difference
✓ A second Spanish project: final exam scores in speaking, reading and listening were higher
THE MATH EMPORIUM at Virginia Tech

Traditional
- 38 sections (~40)
- 10 tenured faculty, 13 instructors, 15 GTAs
- 2 hours per week
- $91 cost-per-student

Redesign
- 1 section (~1520)
- 1 instructor, grad & undergrad TAs + 2 tech support staff
- 24*7 in open lab
- $21 cost-per-student

Replicated at U of Alabama, U of Idaho, LSU, Wayne State, U Missouri-St. Louis, Seton Hall
THE EMPORIUM MODEL
77% Cost Reduction (V1)
30% Cost Reduction (V2)
UNIVERSITY OF ALABAMA
SUCCESS RATES

- Fall 1998: 47.1%
- Fall 1999: 40.6%
- Fall 2000: 50.2%
- Fall 2001: 60.5%
- Fall 2002: 63.0%
- Fall 2003: 78.9%
- Fall 2004: 76.2%
FULLY ONLINE MODEL

Traditional
- Redesign one class
- Emphasize instructor-to-student interaction
- Instructor does all grading and provides all student feedback
- Use a single personnel strategy

Redesign
- Redesign whole course
- Emphasize student-to-student interaction and teaming
- Automate grading and student feedback
- Use a differentiated personnel strategy
U. OF S. MISSISSIPPI
World Literature

Traditional
- 16 – 20 sections (~65)
- Taught by 8 faculty and 8 adjuncts
- Faculty do all grading
- $70 cost-per-student

Redesign
- Single online section
- Team-taught by 4 faculty and 4 TAs
- 50% automated grading via WebCT; 50% TAs
- $31 cost-per-student

✓ Redesign triples course capacity.
THE BUFFET MODEL

- Assess each student’s knowledge/skill level and preferred learning style
- Provide an array of high-quality, interactive learning materials and activities
- Develop individualized study plans
- Build in continuous assessment to provide practice and feedback
- Offer appropriate, varied human interaction when needed
Ohio State University

- Redesign students outscored traditional students on common exams (mean = 78.3 vs. 70)
- Percentage of students needing to retake the course reduced from 33% to 12%.
- Cost-per-student reduced from $191 to $132
LINKED WORKSHOP MODEL

- Replaces developmental courses with just-in-time workshops linked to a college-level course.
- In workshops, students are assigned software modules based on diagnostic assessments and provided support.
- Students use concepts during next core course class session, which helps them see the value of the workshops and motivates them to do workshop activities.
**DEVELOPMENTAL MATH**  
Austin Peay State University

<table>
<thead>
<tr>
<th>Fundamentals of Math</th>
<th>Elements of Statistics</th>
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<tbody>
<tr>
<td>• Traditional: 33% of students who took the developmental and the college-level course sequentially were successful.</td>
<td>• Traditional: 23% of students who took the developmental and the college-level course sequentially were successful.</td>
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<tr>
<td>• Redesign: 70% of students who would have been assigned to a developmental course were successful in the course linked to a workshop.</td>
<td>• Redesign: 52% of students who would have been assigned to a developmental course were successful in the course linked to a workshop.</td>
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</tbody>
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WHAT DO THE FACULTY SAY?

- “It’s the best experience I’ve ever had in a classroom.”
- “The quality of my worklife has changed immeasurably for the better.”
- “It’s a lot of work during the transition--but it’s worth it.”
FACULTY BENEFITS

- Increased opportunity to work directly with students who need help
- Reduced time spent on grading
- Technology does the tracking and monitoring
- More practice and interaction for students without faculty effort
- Ability to try different approaches to meet different student needs
- Opportunity for continuous improvement of materials and approaches
FOR MORE INFORMATION
www.theNCAT.org

- Full project plans
- Monographs
- Progress reports
- Planning resources
- Lessons Learned
- Project contacts
WHAT’S NEXT?

- Application Guidelines
  - 2 redesign projects per university

- Project Timeline
  - Present – August 2013

- Final Project Plan Format
  - 8 February 2012

- Readiness Criteria

- NCAT Resources

WHAT’S NEXT?

- Establish institutional teams
- 13 October 2011
  Deadline for submitting Course Readiness Instrument
- 20 October 2011
  Webinar #2: Developing the Proposal (9:00 – 11:00 am)
WHAT’S NEXT?

- Late-October 2011 through January 2012
  Teams develop project proposals
- 8 February 2012
  Teams submit final proposed plans
- 29 February 2012
  Projects selected
- March – June 2012
  Campus planning & development
WHAT’S NEXT?

- July 2012: Campus Pilots Begin
- 15 December 2012: Interim Campus Reports Due
- December 2012 through February 2013: Campus Revisions
- February 2013: Campus Full Implementations Begin
- 15 August 2013: Final Campus Reports
FINAL PROPOSAL FORMAT
Due 8 February 2012

• Application Narrative
  – Redesign model: how you will embody the Five Principles
  – Changes to course structure
  – Learning materials: what you plan to use
  – Assessment strategy: how you plan to measure student learning
  – Cost reduction strategy: which one and what you will do with the savings
  – Timeline
  – Project budget
FINAL PROPOSAL FORMAT
Due 8 February 2012

- Tools and Forms
  - Assessment Forms (2)
  - Course Completion Forms (2)
  - Course Planning Tool (CPT)
- Draft of your CPT due on 25 January 2012.
- Projects will be selected on 29 February 2012.
WHAT’S NEXT?

- Establish institutional teams
- 13 October 2011
  Deadline for submitting Course Readiness Instrument
- 20 October 2011
  Webinar #2: Developing the Proposal (9:00 – 11:00 am)
What does it mean to be “ready” to do a major course redesign?
Which courses are “ready”—i.e., are good candidates for a comprehensive redesign?
READINESS CRITERION #1
Course Choice

- What impact would redesigning the course have on the curriculum, on students and on the institution—i.e., why do you want to redesign this course?
FACTORS TO CONSIDER WHEN THINKING ABOUT HIGH IMPACT

- High drop-failure-withdrawal rates
- Student performance in subsequent courses
- Students on waiting lists
- Student complaints
- Other departmental complaints
- Lack of consistency in multiple sections
- Resource problems
READINESS CRITERION #2
Redesign Model

- Which redesign model do you think would be most appropriate for your redesign? Why?
- What aspects fit your particular discipline and your particular students?
READINESS CRITERION #3
Assessment Plan

- Which assessment model do you think would be most appropriate for your redesign? Why?
READINESS CRITERION #4 Cost Savings Plan

- Which cost savings strategy do you think would be most appropriate for your redesign? Why?
READINESS CRITERION #5
Learning Materials

- Are the faculty able and willing to incorporate existing curricular materials in order to focus work on redesign issues rather than materials creation?
READINESS CRITERION #6
Active Learning

- Do the faculty members have an understanding of and some experience with integrating elements of computer-based instruction into existing courses?
READINESS CRITERION #7
Collective Commitment

- Are the academic staff members ready to collaborate?
- Have they engaged in joint conversations about the need for change?
- Are decisions about the unit made collectively—in other words, beyond the individual academic staff member level?
REQUIRED READING FOR WORKSHOP II

- Round I Redesigns: Lessons Learned
- Round II Redesigns: Lessons Learned
- Round III Redesigns: Lessons Learned

http://www.theNCAT.org/PCR/Outcomes.htm
http://www.theNCAT.org/R2R/R2R_R2R_Planning_Resources.htm

- Six Models for Course Redesign
- Five Principles of Successful Course Redesign
- Four Models for Assessing Student Learning
- Cost Reduction Strategies
- Five Critical Implementation Issues
- Assessment Planning Forms
- Course Planning Tool
- Planning Checklist
REDESIGN CASE STUDIES

- By discipline
- By model
- By degree of success

http://www.theNCAT.org/PCR/Proj_Discipline_all.html
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