

ACADEMIC PRODUCTIVITY

The Case for Course Redesign





- **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**

HIGHER EDUCATION'S CHALLENGES

- Access
- Quality
- Cost



How can information technology help?

TRADITIONAL INSTRUCTION

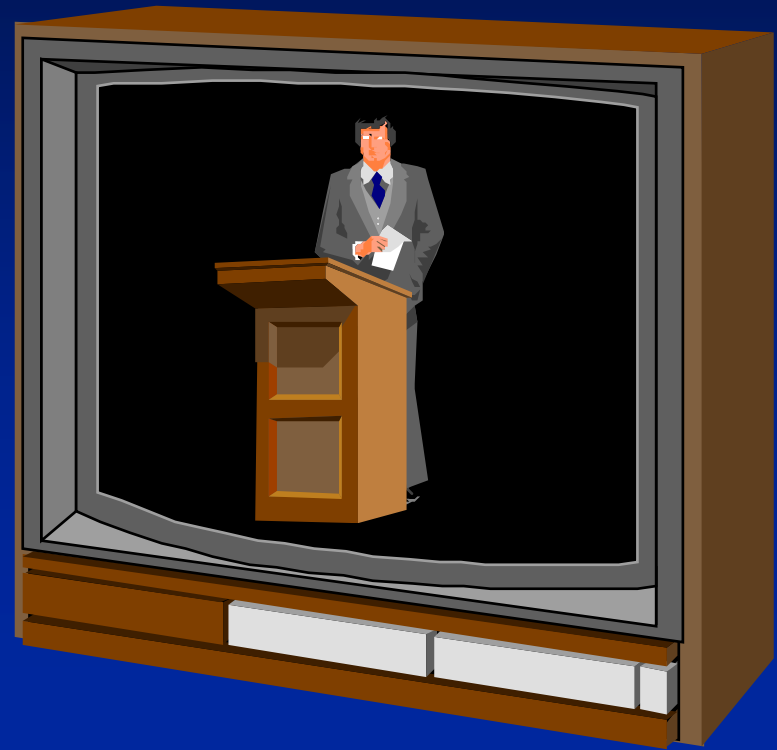
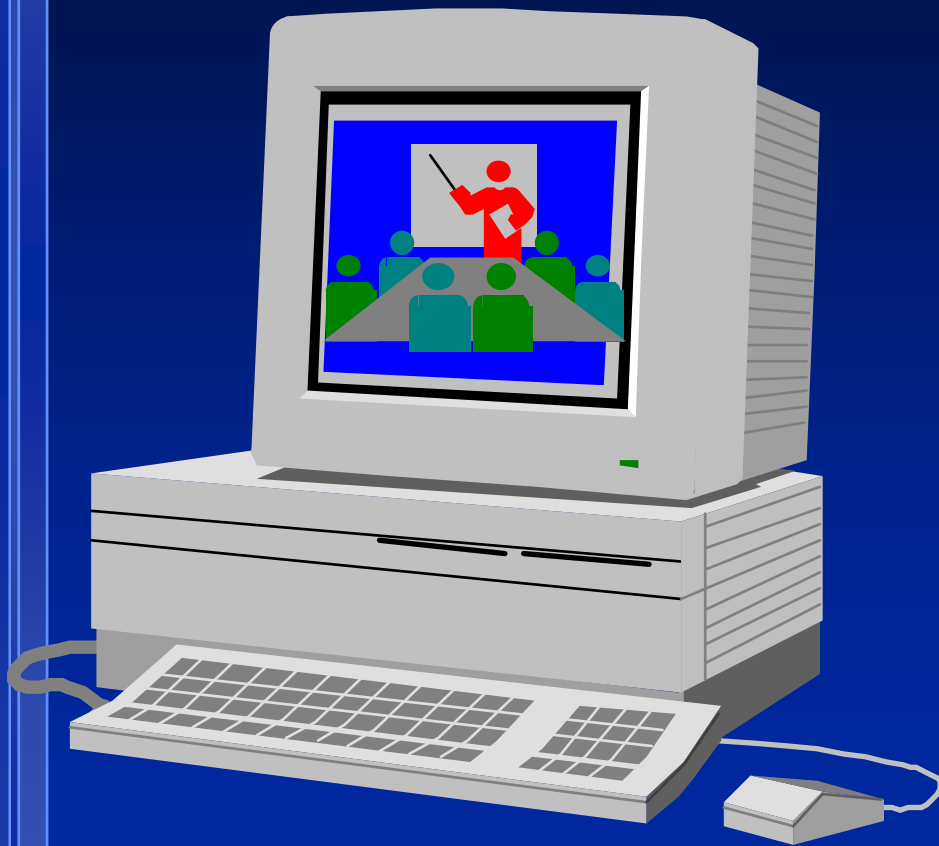


Seminars



Lectures

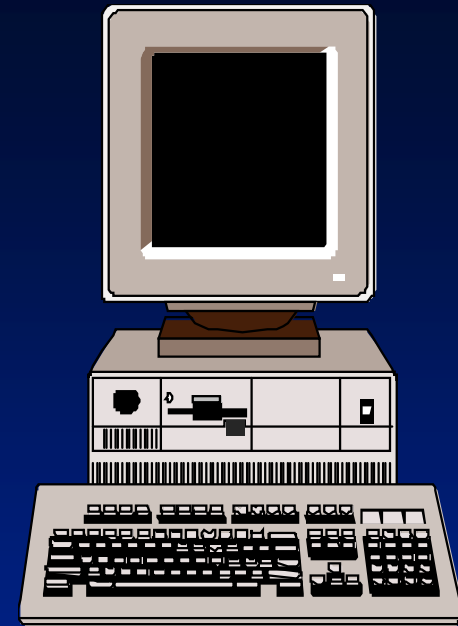
“BOLT-ON” INSTRUCTION



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.

Focus: Introductory Courses



**50,000
students
30 projects**

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.



The **National Center** for
Academic Transformation

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 showed improvement;
5 showed equal learning.**

REDUCTION IN DFW RATES

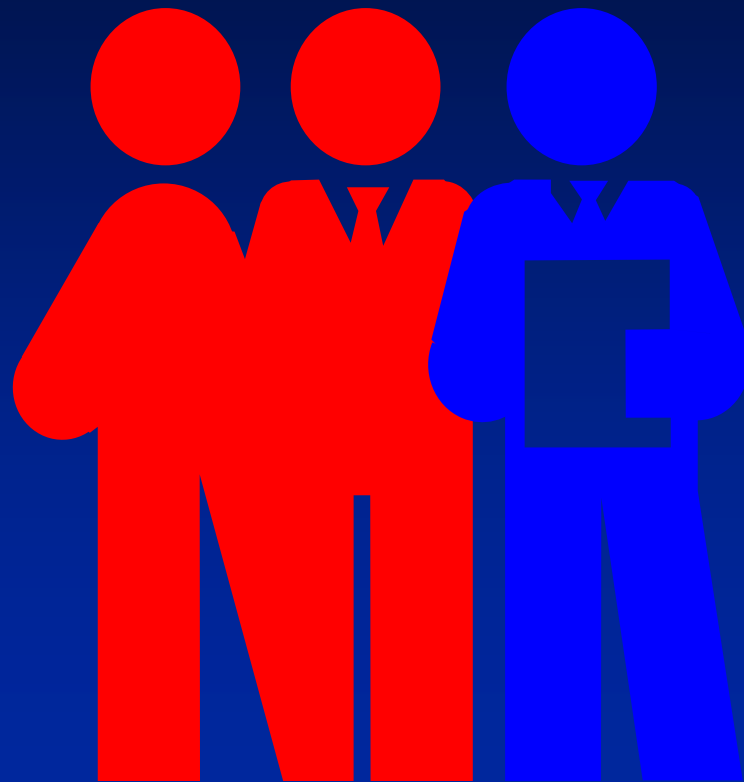
- U of Alabama – 60% to 40%
- Drexel – 51% to 38%
- Tallahassee CC – 46% to 25%
- Rio CC – 41% to 32%
- IUPUI – 39% to 25%
- UNM – 39% to 23%
- U of S Maine – 28% to 19%
- U of Iowa – 25% to 13%
- Penn State – 12% to 9.8%



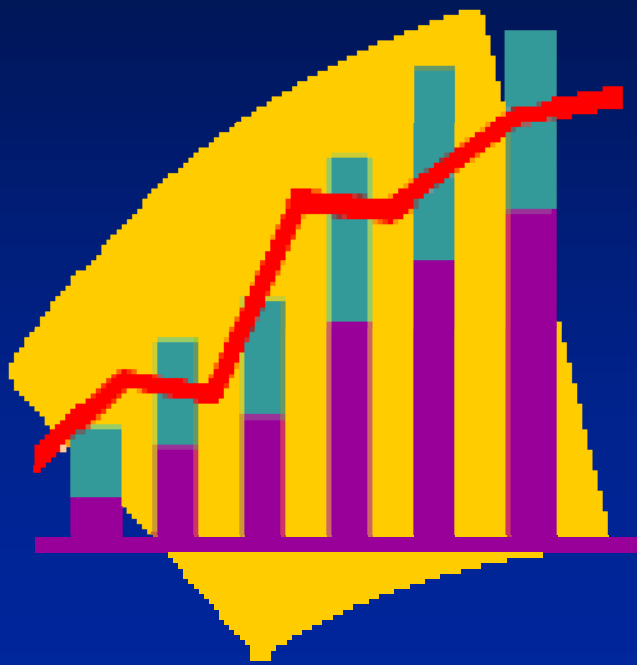
24 measured; 18 showed improvement.

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.



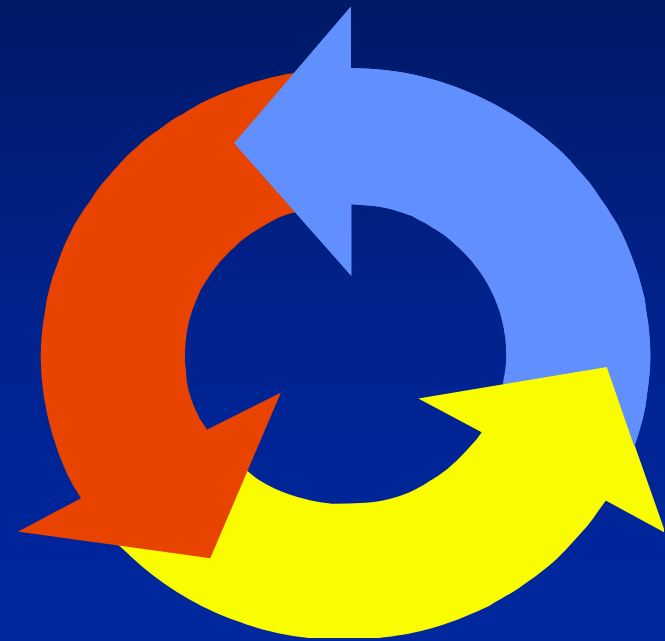
TAKING COURSE REDESIGN TO SCALE



- **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 (25+ institutions)

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
- 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

MANY DIFFERENT COURSES

- **Mathematics**

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

- **Statistics**

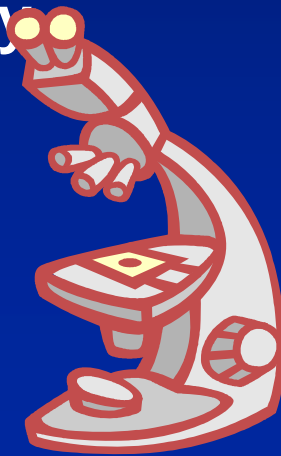
- Business Statistics
- Introductory Statistics
- Elementary Statistics
- Economic Statistics

- **Computing**

- Computer Programming
- Information Technology Concepts
- Computer Literacy
- Information Literacy
- Tools for the Information Age

- **SCIENCE**

- Anatomy and Physiology
- Astronomy
- Biology
- Ethnobotany
- Chemistry
- Geology

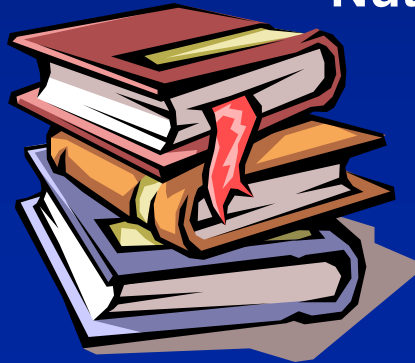


- **SOCIAL SCIENCE**

- 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
- Organizational Behavior
- Public Speaking
- Accounting
- Nursing
- Nutrition

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.”



IMPLICATIONS

- It can be done.
We can decrease cost while increasing quality.
- Faculty are not the problem!
- Lack of leadership (at all levels) is.



This is not rocket science!

FOR MORE INFORMATION

www.theNCAT.org

- Project descriptions
- Progress reports
- Project contacts
- Program descriptions
- Monographs
- Planning resources

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