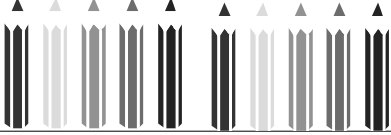


**IMPROVING QUALITY
AND REDUCING COSTS:**
Redesigning Campus Learning Environments




TODAY'S DISCUSSION

- Overview of the Program in Course Redesign
- Context for Redesign
- Institutional and Course Readiness
- Redesign Models
- Planning for Redesign
- Assessment Ideas



PROGRAM PURPOSE


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



30 projects


PROGRAM OBJECTIVES

- Focus on large enrollment, introductory courses
- Develop multiple models for teaching and learning
- Teach institutions "how to" redesign
- Create a body of shareable information and practice
- Support communication and collaboration
- Disseminate the results



**THE FOCUS:
LARGE-ENROLLMENT
INTRODUCTORY COURSES**

- Successful course completion is critical for first-year students.
- Typical drop-failure-withdrawal rates contribute heavily to overall institutional drop-out rates between the first and second year.
 - Research Us = 15%
 - Comprehensives = 22% to 45%
 - Community colleges = 40% to 50% or higher



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



VARIETY OF INSTITUTIONS IN THE PROGRAM IN COURSE REDESIGN

- **Research Universities**
- **Comprehensive Universities**
- **Private Colleges**
- **Community Colleges**

**Over 50,000 students annually
in 30 courses**

TEAM EFFORT IS KEY

Each team included

- Administrator
- Faculty experts
- Technology expertise
- Assessment assistance

DO STUDENTS LEARN?

- IUPUI redesign students had higher grades than traditional students and scored higher on a concept knowledge test. DFW rates dropped from 50% to 23%.
- Penn State redesign students outperformed the traditional group on overall posttest performance (66% vs. 60%).
- Rio increased retention from 59% to 68%.
- UCF redesign students increased content learning by 2.92 points compared to traditional students' 1.67 point increase.
- USM redesign students showed an increase in concept knowledge. There has been a 10 -20% reduction in grades less than C .

DO STUDENTS LEARN?

- Fairfield U redesign students in Biology scored higher (88%) correct in a second year Genetics course compared with students in the old model (79%) and 4% more students selected biology as a major.
- Carnegie Mellon students can not only calculate the statistic, but also select it, demonstrating higher statistical literacy.
- U of Idaho students had higher average math grades in all 3 classes that were moved to the Poly Math Center.

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.

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%



18 of 24 that measured showed improvement.

COST SAVINGS RESULTS

- Redesigned courses reduce costs by 37% on average, with a range of 15% to 77%.
- Final results show actual annual savings of ~\$3 million.



WHAT HAPPENS TO THE SAVINGS? \$3.1 Million Annually

- 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



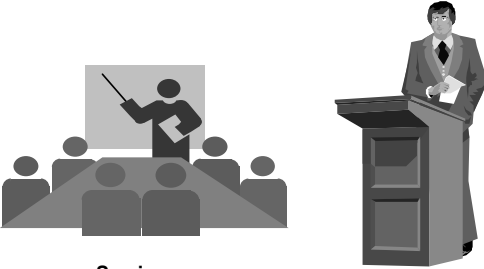
WHAT DO THE FACULTY SAY?

- "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."



Context for Redesign

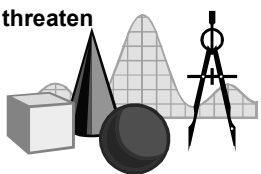
Traditional Instruction



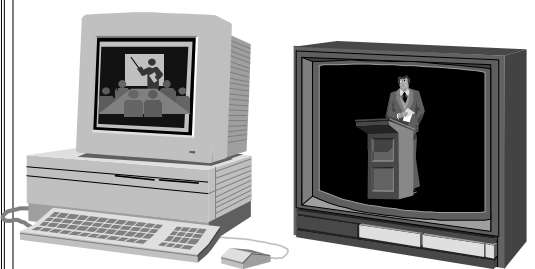
Seminars
 Lectures

ASSUMPTIONS THAT GET IN THE WAY

- Improving quality means increasing cost
- Adding IT increases cost
- Using IT may even threaten quality




“Bolt-on” Instruction




WHAT’S WRONG WITH THE LECTURE?

- Treats all students as if they are the same
- Ineffective in engaging students
- Inadequate individual assistance
- Poor attendance and success rates
- Students fail to retain learning



WHAT’S WRONG WITH MULTIPLE SECTIONS?


- In theory: greater interaction
- In practice: large class size
- In practice: dominated by the same presentation techniques
- Lack of coordination
- Inconsistent outcomes



A STREAMLINED REDESIGN METHODOLOGY

“A Menu of Redesign Options”

- Readiness Criteria
- Five Principles of Successful Course Redesign
- Five Models for Course Redesign
- Cost Reduction Strategies
- Course Planning Tool
- Course Structure Form
- Five Critical Implementation Issues
- Planning Checklist
- Five Models for Assessing Student Learning



INSTITUTIONAL READINESS

- What does it mean to be ready to do a major course redesign?
- Is your institution ready?

INSTITUTIONAL READINESS CRITERIA

- Does your institution want to control or reduce costs and increase academic productivity?
- Is there a demonstrated commitment on the part of institutional leaders to use technology to achieve strategic academic goals (that moves beyond using technology to provide general support for all faculty and for all courses)?

INSTITUTIONAL READINESS

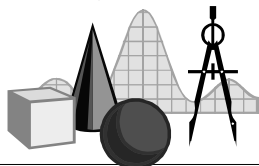
- Is computing firmly integrated into your campus culture?
- Do you have a mature information technology (IT) organization(s) to support faculty integration of technology into courses? Or do you contract with external providers to provide such support?

INSTITUTIONAL READINESS

- Do a substantial number of faculty members have an understanding of and some experience with integrating elements of computer-based instruction into existing courses?
- Does your institution have a demonstrated commitment to learner-centered education?
- Has your institution made a commitment to assuring learner readiness to engage in IT-based courses?

INSTITUTIONAL READINESS

- Is there a recognition on your campus that large-scale course redesign using information technology involves a partnership among faculty, IT staff and administrators in both planning and execution?



INSTITUTIONAL READINESS

- Desire to reduce costs
- Commitment to use technology strategically
- Pervasive computing
- Mature IT organization
- Faculty experience
- Commitment to learner-centeredness
- Commitment to learner readiness
- Partnership in planning and execution

COURSE READINESS

- Which courses are “ready” – that is, are good candidates for a comprehensive redesign?
- What should be considered in the selection of courses?

THE ONE PERCENT SOLUTION

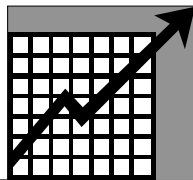
- Maricopa Community College District
- 200,000 students
- 2,000 course titles
- 25 courses = 44% enrollment



All CCs = 51%
All four-year = 35%

THE ONE PERCENT SOLUTION

- English (7)
- Psychology (1)
- Mathematics (5)
- Fitness (1)
- Sociology (1)
- Computing (1)
- Philosophy (1)
- Economics (2)
- Biology (2)
- Accounting (1)
- EMT (1)
- Spanish (1)
- Chemistry (1)



COURSE READINESS CRITERIA

- Will changes in this course have a high impact on the curriculum?

FACTORS TO CONSIDER WHEN THINKING ABOUT HIGH IMPACT

Consider addressing a problem that impacts student performance such as:

- High withdrawal/failure rates
- Difficulty getting qualified adjuncts
- Students on waiting lists
- Students turned away – graduation bottleneck
- Over enrollment of courses leading to multiple majors – consistency of preparation
- Difficulty in subsequent courses

COURSE READINESS CRITERIA

- Does the course offer the possibility of capital-for-labor substitution?
- Are decisions about curriculum in this department, program or school made collectively—i.e., beyond the individual faculty member level?
- Are the faculty able and willing to incorporate existing curricular materials in order to focus work on redesign issues rather than materials creation?

COURSE READINESS CRITERIA

- Do the project participants have the requisite skills?
- Have the course's expected learning outcomes and a system for measuring their achievement been identified?
- Do the faculty involved have a good understanding of learning theory?
- Do you have a business plan for achieving redesign goals so that the innovation can be self-sustaining in the future?

COURSE READINESS CRITERIA

- High impact
- Capital-for-labor substitution
- Collective decision-making
- Willingness to incorporate existing materials
- Requisite skills
- Learning outcomes and way to measure
- Faculty understanding of learning theory
- Business plan to be self-sustaining

FIVE PRINCIPLES OF SUCCESSFUL COURSE REDESIGN

- #1: Redesign the whole course
 - Q – Course coherence and quality control
 - C – Eliminate duplicate effort; use alternate staffing
- #2: Encourage active learning
 - Q – “Learning is not a spectator sport.”
 - C – Reduce faculty preparation and presentation time (e.g., interactive software, peer learning teams)
- #3: Provide students with individualized assistance
 - Q – Students get help when they are “stuck” and stay on task rather than giving up
 - C – Apply the right level of human intervention

FIVE PRINCIPLES OF SUCCESSFUL COURSE REDESIGN

- #4: Build in ongoing assessment and prompt (automated) feedback
 - Q – Enables practice, diagnostic feedback, focused time on task
 - C – Automation reduces cost while improving quality
- #5: Ensure sufficient time on task and monitor student progress
 - Q – Self-pacing vs. milestones for completion
 - C – Course management systems can reduce costs while increasing oversight

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



COMMON CHARACTERISTICS of the MODELS

- Redesign applied to all sections of the course
- Active Learning
- Computer Based Learning Resources
- Mastery Learning
- On Demand Help
- Alternative Staffing

SUPPLEMENTAL MODEL

- Maintain the basic current structure
- Change the content so that more is available on line
- Change interaction so that students are interacting more with the material
- Change the use of the time to reduce or eliminate lecturing and increase student interaction

BIOLOGY University of Massachusetts

CHALLENGES

- Inconsistent student preparation
- Poor class attendance
- Lectures that repeated the contents of the textbook
- High dissatisfaction with course by both faculty and students

BIOLOGY University of Massachusetts

- Continue to have large class meetings
- Require short pre-tests before the start of the first class each week and these are available for the entire term as review
- Receive small number of points for taking the online quiz
- Provide 24/7 online study materials
- Include small group interactions during class focused on applied biology problems
- Class periods are now used to discuss biology problems, rather than lecture

BIOLOGY University of Massachusetts

Student Outcomes

- In spite of more difficult questions, scores on exams in the redesigned course averaged 73% vs. 61% in the traditional course.
- 23% of the exam questions in the traditional model required reasoning or problem solving skills vs. 67% in the redesigned course.
- Attendance averaged 89.9% in the redesigned course vs. 67% in the traditional course.

REPLACEMENT MODEL

- Blend face-to-face with online activities
- Determine exactly what activities required face-to-face and reduce the amount of time to focus only on those activities in class
- Provide 24/7 online interactive learning materials and resources
- Include online self-assessment activities with immediate feedback

ENGLISH COMPOSITION Tallahassee CC

- Diverse Student Population
- Many students still in need of remediation
- Many class hours used to review grammar skills
- High inconsistency among sections
- Poor success rates (>60%)

**ENGLISH COMPOSITION
Tallahassee CC**

GOAL: Student Centered Learning Environment

- Individualized diagnosis and prescription
- Active participation
- Meaningful writing assignments
- Collaboration
- Flexibility

**ENGLISH COMPOSITION
Tallahassee CC**

<p style="text-align: center;"><u>Traditional</u></p> <ul style="list-style-type: none"> • 3000 students annually in sections of ~30 • ~50% lecture • ~50% discussion • High inconsistency among sections • High use of full-time faculty to help increase consistency 	<p style="text-align: center;"><u>Redesign</u></p> <ul style="list-style-type: none"> • 3000 students annually in sections of ~30 • Taught in computer labs • Interweave writing and reading • Menu of reading & writing activities • Discussion board for Peer Collaboration • SMARTHINKING tutors
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**ENGLISH COMPOSITION
Tallahassee CC**

QUALITY IMPROVEMENTS

- Individualized programs of study
- Immediate feedback and prescribed activities
- Increased time-on-task
- Decreased feedback time on writing assignments

**ENGLISH COMPOSITION
Tallahassee CC**

QUALITY IMPROVEMENTS

- More time for writing activities, conferencing, collaborative activities, critiques, discussion, etc.
- More time to explore ideas, and develop critical thinking skills
- More time for one-on-one and small group conferencing

**ENGLISH COMPOSITION
Tallahassee CC**


OUTCOMES

- Increased success rates, 60.7% in traditional and 68.4% in redesign
- Increased time on task
- Writing about literature
- Increased communication and interaction about writing

**SPANISH
University of Tennessee**

CHALLENGES

- Inconsistent student preparation
- Inability to accommodate all who would like to take this course – bottleneck to graduation
- Inability to accommodate different learning styles
- Limited number of qualified instructors
- Time in class devoted to grammar and vocabulary – not expressive speaking and writing



SPANISH
University of Tennessee

ACADEMIC GOALS

- Enhance quality by individualizing learning opportunities
- Provide feedback and direction to allow students to make up for specific deficiencies
- Spend greater class time on expressive speaking and writing by shifting vocabulary and grammar study online
- Serve more students more effectively to enhance graduation opportunities – remove the bottleneck

Traditional

- 57 sections (~27)
- Adjuncts + 6 TAs
- 100% in class
- \$167,074 (\$2931/section)
- \$109 cost-per-student

Redesign

- 38 sections (~54)
 - Instructor-TA pairs
 - 50% in class, 50% online
 - \$56,838 (\$1496/section)
 - \$28 cost-per-student
- ✓ 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

EMPORIUM MODEL

- Move all classes to a lab setting
- Permit the use of multiple kinds of personnel
- Allow students to work as long as they need to master the content
- Can be adapted for the kinds of students at a particular institution
- Allow multiple courses the same time
- Include multiple examples in math

EMPORIUM MODEL
University of Alabama

PRE-CALCULUS MATH
University of Alabama

Problems

- No support for multiple learning styles
- No flexibility in instructional pace
- Lack of student success
 - D/F/W rates as high as 60%
- Very high course repeat percentage
- Negative impact on student retention
- Significant drain on resources

PRE-CALCULUS MATH
University of Alabama

Redesigned Course Format

- 30-50 minute group meetings weekly
- 3-4 hours in lab or elsewhere working independently using software that presents a series of topics covering specific learning objectives
- Practice problems and assessments that cover defined learning objectives
- Quizzes taken multiple times with immediate feedback
- Tests available on demand with a specified completion date
- Instructors and tutors available in lab to provide individualized assistance

PRE-CALCULUS MATH University of Alabama

Pass Rates by Ethnicity

	<u>F 98</u>	<u>F 99</u>	<u>F 00</u>	<u>F 01</u>	<u>F 02</u>
African-American	46.2%	35.0%	59.4%	60.4%	63.6%
Caucasian	46.9%	41.1%	46.5%	60.7%	62.3%
Overall	47.1%	40.6%	50.2%	60.5%	63.0%

FULLY ONLINE MODEL

- Moves all or most of the learning environment online
- Provides access to anyone, anywhere, anytime – on demand
- Allows international groups of students to interact easily and learn from each other



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

WORLD LITERATURE U of Southern Mississippi



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.

PRE-CALCULUS MATH Rio Salado College



Traditional

- 4 courses taught by 4 instructors
- Student interaction = each instructor
- \$49 cost-per-student
- Retention = 59%

Redesign

- 4 courses taught by 1 instructor
- Student interaction = interactive software, 1 course assistant, and 1 instructor
- \$31 cost-per-student
- Retention = 65%


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
- Built in continuous assessment to provide instantaneous feedback
- Offer appropriate, varied human interaction when needed

STATISTICS
Ohio State University

CHALLENGES

- Previous redesign using IT increased the cost
- Students had highly variable learning styles
- Lectures were poorly attended
- 20% of the students repeat the course each quarter even though most have satisfactorily completed initial modules
- Too many emails for faculty
- Faculty time was used inefficiently
- Inconsistency among sections



STATISTICS
Ohio State University

- Students use online assessment by Felder and Solomon.
- There are multiple routes to established outcomes for each module.
- Students are assisted in thinking about how they approach learning and what mode is easiest for them.
- Students file a learning plan for each module.
- Various kinds of learning activities using websites, software, video lectures, small group discussions, individual and group projects.

STATISTICS
Ohio State University

PRELIMINARY OUTCOMES

- Redesign students had greater success on common exams (mean = 78.3) than traditional students (mean = 70).
- The number of students needing to retake the course was reduced from 33% to 24%.

FACULTY BENEFITS

- Increased opportunity to work directly with students who need help
- Reduced 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

COST REDUCTION

- Cost reduction strategies
- Course structure form
- Course planning tool

COST REDUCTION STRATEGIES


- Step 1 - Identify the enrollment profile of the course
 - Stable enrollment
 - Growing enrollment
- Step 2 - Choose the appropriate cost reduction strategy
- Step 3 - Choose the labor savings tactic(s) that will allow you to implement the chosen strategy with no diminution in quality

STABLE COURSE ENROLLMENT

- Reduce the number of sections and increase the section size. (Reduce the number teaching the course.)
- Reduce the number of graduate teaching assistants (GTAs). (Only 9 of 30 projects!)
- Change the mix of personnel teaching the course. (Adjuncts, undergrad learning assistants)


Mix and match for greater savings!

FAIRFIELD UNIVERSITY General Biology



<u>Traditional</u>	<u>Redesign</u>
• 7 sections (~35)	• 2 sections (~140)
• 7 faculty	• 4 faculty
• 100% wet labs	• 50% wet, 50% virtual
• \$131,610	• \$98,033
• \$506 cost-per-student	• \$350 cost-per-student

VIRGINIA TECH Linear Algebra




<u>Traditional</u>	<u>Redesign</u>
• 38 sections (~40)	• Single section (1520)
• 10 tenured faculty, 13 instructors, 15 GTAs	• 1 tenured faculty, graduate & undergraduate assistants
• 2 hours per week	• 24 x 7 in open computer lab
• \$91 cost-per-student	• \$26 cost-per-student

ACCOMMODATE ENROLLMENT GROWTH

- Increase the number of sections, keep section size the same and keep personnel the same.
- Reduce the number of sections, increase the section size and change the mix of personnel.
- Change the mix of personnel teaching the course.


Mix and match for greater savings!

RIO SALADO COLLEGE Pre-Calculus Mathematics



<u>Traditional</u>	<u>Redesign</u>
• 4 courses taught by 4 instructors	• 4 courses taught by 1 instructor
• Student interaction = each instructor	• Student interaction = interactive software, 1 course assistant, and 1 instructor
• \$49 cost-per-student	• \$31 cost-per-student

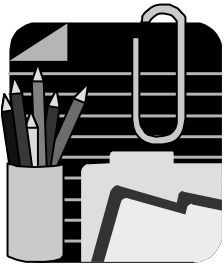
U OF TENNESSEE Spanish



<u>Traditional</u>	<u>Redesign</u>
• 57 sections (~27)	• 38 sections (~54)
• Adjuncts + 6 TAs	• Instructor-TA pairs
• 100% in class	• 50% in class, 50% online
• \$167,074 (\$2931/section)	• \$56,838 (\$1496/section)
• 1529 students @ \$109	• 2052 students @ \$28

COURSE STRUCTURE FORM

A formatted spreadsheet that enables institutions to compare the structure of the traditional course with the that of the redesigned course (types of sections, number of students enrolled and the kinds of personnel)



COURSE STRUCTURE FORM									
Institution Name:									
Course Name:									
	TRADITIONAL				REDESIGN				
	Fall	Spring	Summer	Total	Fall	Spring	Summer	Total	
COURSE STRUCTURE									
Length of term (in weeks)									
Total course enrollment									
# of type 1 sections									
# of type 2 sections									
# of students per type 1 section									
# of students per type 2 section									
COURSE MEETINGS									
Type 1 Section									
Total # of in-class hours per week									
Total # of lectures per week									
Length of each lecture (hours)									
Total # of recitations per week									
Length of each recitation (hours)									
Total # of labs per week									
Length of each lab (hours)									
Total # of other meetings per week									
Length of each (hours)									
Type 2 Section									
Total # of in-class hours per week									
Total # of lectures per week									
Length of each lecture (hours)									
Total # of recitations per week									
Length of each recitation (hours)									
Total # of labs per week									
Length of each lab (hours)									
Total # of other meetings per week									
Length of each (hours)									

INSTRUCTIONAL PERSONNEL									
Type 1 Faculty									
Number teaching the course									
Number of sections per faculty									
Number of lectures per faculty									
Number of recitations per faculty									
Number of labs per faculty									
Number of other meetings per faculty									
Type 2 Faculty									
Number teaching the course									
Number of sections per faculty									
Number of lectures per faculty									
Number of recitations per faculty									
Number of labs per faculty									
Number of other meetings per faculty									
Graduate Teaching Assistants (GTAs)									
Number teaching the course									
Number of sections per GTA									
Number of lectures per GTA									
Number of recitations per GTA									
Number of labs per GTA									
Number of other meetings per GTA									
Undergraduate Assistants (UGAs)									
Number assisting in the course									
Number of sections per UGA									
Number of lectures per UGA									
Number of recitations per UGA									
Number of labs per UGA									
Number of other meetings per UGA									


LABOR SAVINGS TACTICS

Substitute (in part or in whole)!

- Coordinated development and delivery and shared instructional tasks
- Interactive tutorial software
- Automated grading
- Course management software
- Peer interaction or interaction with other personnel
- Online training materials
- Individual development and delivery
- Face-to-face class meetings
- Hand grading
- Human monitoring and course administration
- One-to-one faculty/student interaction
- Face-to-face training of GTAs, adjuncts and other personnel

COURSE PLANNING TOOL

A formatted spreadsheet that enables institutions to compare the "before" activities and costs (the traditional course) and the "after" activities and costs (the redesigned course)



ACTIVITIES AND COSTS

- Determine all personnel costs expressed as an hourly rate.
- Determine the specific tasks associated with offering a course.
- Determine how much time each person spends on each of the tasks.
- Calculate the total instructional costs.
- Redesign the course by task and re-calculate the costs.

Instructional Costs per Hour

Faculty		TAs/GAs	
Salary	\$89,538	Salary	\$32,618
% devoted to instruction	50%	% devoted to instruction	50%
% devoted to this course	50%	% devoted to this course	50%
\$ devoted to this course	\$22,385	\$ devoted to this course	\$8,155
Contact hours for course	30	Contact hours for course	116
Out of class hours	140	Out of class hours	244
Total hours	170	Total hours	360
Cost per hour	\$132	Cost per hour	\$23
Support Staff	\$ per Hour		
Position			
#1	\$19		
#2	\$29		
#3	\$12		
#4	\$7		

Traditional Course Preparation

	FACULTY		TAs/GAs	
	Hourly rate =	\$132	Hourly rate =	\$23
I. Course Preparation	# of Hours	Total Cost	# of Hours	Total Cost
A. Curriculum Development				
B. Materials Acquisition				
C. Materials Development				
1. Lectures/presentations	60	\$7,900	464	\$10,510
2. Learning materials/software				
3. Diagnostic assessments				
4. Assignments				
5. Tests/evaluations	12	\$1,580	88	\$1,993
Sub-Total	72	\$9,480	552	\$12,503
D. Faculty/TA Devmt/Training				
1. Orientation			240	\$5,436
2. Staff meetings	15	\$1,975	120	\$2,718
3. Attend lectures			240	\$5,436
Sub-Total	15	\$1,975	600	\$13,590
Total Preparation	87	\$11,455	1152	\$26,093

Traditional Course Delivery

II. Course Delivery	# of Hours	Total Cost	# of Hours	Total Cost
A. Instruction				
1. Diagnose skill/knowledge level				
2. Presentation	30	\$3,950		
3. Interaction	30	\$3,950	1048	\$23,737
4. Progress monitoring				
Sub-Total	60	\$7,900	1048	\$23,737
B. Evaluation				
1. Test proctoring	11	\$1,448	32	\$725
2. Tests/evaluation	12	\$1,580	648	\$14,677
Sub-Total	23	\$3,028	680	\$15,402
Total Delivery	83	\$10,929	1728	\$39,139
TOTAL	170	\$22,384	2880	\$65,232
Support Staff = \$3805				
GRAND TOTAL		\$91,421		
Total # of students	350			
Cost per student		\$261.20		

Redesigned Course Preparation

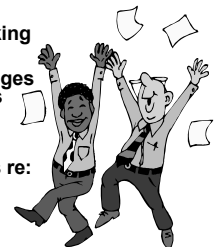
I. Course Preparation	FACULTY		TAs/GAs	
	# of Hours	Total Cost	# of Hours	Total Cost
A. Curriculum Development	Hourly rate =	\$132	Hourly rate =	\$23
B. Materials Acquisition				
C. Materials Development				
1. Lectures/presentations	15	\$1,975	224	\$5,074
2. Learning materials/software				
3. Diagnostic assessments				
4. Assignments				
5. Tests/evaluations	12	\$1,580	88	\$1,993
Sub-Total	27	\$3,555	312	\$7,067
D. Faculty/TA Devmt/Training				
1. Orientation			240	\$5,436
2. Staff meetings	15	\$1,975	120	\$2,718
3. Attend lectures			120	\$2,718
Sub-Total	15	\$1,975	480	\$10,872
Total Preparation	42	\$5,530	792	\$17,939

Redesigned Course Delivery

II. Course Delivery	# of Hours	Total Cost	# of Hours	Total Cost
A. Instruction				
1. Diagnose skill/knowledge				
2. Presentation	30	\$3,950		
3. Interaction	30	\$3,950	808	\$18,301
4. Progress monitoring				
Sub-Total	60	\$7,900	808	\$18,301
B. Evaluation				
1. Test proctoring	11	\$1,448	32	\$725
2. Tests/evaluation	12	\$1,580	408	\$9,241
Sub-Total	23	\$3,028	440	\$9,966
Total Delivery	83	\$10,929	1248	\$28,267
TOTAL	125	\$16,459	2040	\$46,206
Support Staff Carryover		\$3,805		
Additional Support Staff	480	\$3,350		
Total Support Staff		\$7,155		
GRAND TOTAL		\$69,830		
Total # of students	350			
Cost per student		\$199.51		

THE CPT - IS IT WORTH IT?

- Provides a structure for thinking about activities and costs
- Allows consideration of changes in specific instructional tasks
- Permits visualization of duplication and waste
- Enables cost/benefit analysis re: type of personnel per task



FIVE CRITICAL IMPLEMENTATION ISSUES

- Prepare students (and their parents) and the campus for changes in the course.
- Train instructors, GTAs and undergraduate peer tutors.
- Ensure an adequate technological infrastructure to support the redesign as planned.
- Achieve initial and ongoing faculty consensus about the redesign.
- Avoid backsliding by building ongoing institutional commitment to the redesign.



REDESIGN CHECKLIST

- Consensus about Curriculum
- Course Organization
- Materials Selection and Adaptation
- Faculty Development and Training
- Student Preparation
- Infrastructure

Assessment Strategies

WHY ASSESS?

To establish the degree to which improved learning has been achieved as a result of the course redesign.



TYPES OF ASSESSMENT

- Ongoing or Formative – to help students understand what they know and what they don't know so that they can focus on what they don't know
- Summative – to determine whether students have achieved the learning outcomes desired

ONGOING ASSESSMENT

- Require frequent low stakes assessment options such as quizzes or online exercises
- Include immediate automated feedback and guidance for further review
- Encourage students to take low stakes quizzes multiple times – “do it until you get it right”
- Be sure there are points or rewards associated with taking ongoing assessments
- Use results to help students structure individual study time
- Use results to organize in-class meetings as results provide focus on areas of weakness

KEY SUMMATIVE ASSESSMENT Q's

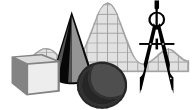
How will you know that students are learning as least as much as they were before the redesign?

- How will students demonstrate that they have
- mastered the concepts?
 - achieved the learning outcomes?

ASSESSMENT PLANNING

Step 1. Establish the method of obtaining data.

Step 2. Choose the measurement method.



ESTABLISH THE METHOD OF OBTAINING DATA

Pilot Phase

- Parallel Sections – Compare traditional sections and redesign sections.
- Baseline “Before” (Traditional) and “After” (Redesign)

ESTABLISH THE METHOD OF OBTAINING DATA

Full Implementation Phase

- Use baseline data from an offering of the traditional course before the redesign began.
- Use data from parallel sections offered in the traditional format during the pilot phase.

VALIDITY FACTORS

- Focus on learning outcomes so that you are measuring what you think you are measuring.
- Be sure that you use the same measures and procedures to collect the data for the pilot and full implementation.
- As much as possible, be sure that any differences between the student populations in each type of section are minimized.

CHOOSE THE MEASUREMENT METHOD: FIVE MODELS

- A. Comparisons of Final Exams
- B. Comparisons of Common Content Items Selected from Exams
- C. Comparisons of Pre- and Post- Tests
- D. Comparisons of Student Work using Common Rubrics
- E. Comparisons of Course Grades using Common Criteria

WHAT ELSE MIGHT BE ASSESSED?

- **Retention**
 - Grade Based
 - Not always reflective of learning
- **Satisfaction**
 - Why assess?
 - How to think about the responses?
- **Downstream Success**
 - Important but difficult to do
 - Tracking within the major – an option

TIPS

- **Avoid “add on” assessments unless they provide useful data.**
- **If parallel sections are based on student choice, consider whether student differences account for results.**

FIVE ASSESSMENT MODELS

- **Step 1. Establish the method of obtaining data**
 - Pilot phase
 - Full implementation phase
- **Step 2. Choose the measurement method**
 - Comparisons of Common Final Exams
 - Comparisons of Common Content Items Selected from Exams
 - Comparisons of Pre- and Post-tests
 - Comparisons of Student Work Using Common Rubrics
 - Comparisons of Course Grades Using Common Criteria

CASES FOR REDESIGN USING THE 5 MODELS

- Statistics at a Large Research University**
- Fine Arts at a State University**

STATISTICS Penn State University

CHALLENGES

- Faculty would like to address different learning preferences of students.
- Lectures are quite passive and students are not engaged with the content.
- Requiring 12 GTAs, the course has high personnel costs
- There is no tutoring assistance.
- Students do not remember what they have learned in subsequent courses.

STATISTICS Penn State University

- Reduces lectures each week from 3 to 1.
- Use Readiness Assessment Tests (RATs) to identify both student and group readiness to move on by measuring mastery of material as well as testing knowledge students already have.
- Traditional recitations are now computer-mediated workshops.
- Greater one-to-one contact between students and faculty.
- GTA roles shift from instruction to guidance.

STATISTICS
Penn State University

OLD STRUCTURE

- Annual enrollment – 2200 students in large sections of ~240 students
- 4 FT faculty lecture to ~240 students 3 times a week
- 12 GTAs lead 2 recitation sections of ~40 students each per week
- GTAs hold office hours and grade

STATISTICS
Penn State University

NEW STRUCTURE

- Annual enrollment – 2200 students
- 1 lecture section of ~240 students per week
- 2 1-hour computer labs
- 4 FT faculty lecture 1 hour per week, create exams, review materials, provide assistance to students in the lab and supervise GTAs
- 6 GTAs provide assistance to students in the lab, proctor computerized tests
- UGTAs assist students in the lab

STATISTICS
Penn State University

OUTCOMES

- Redesign students outperformed the traditional group on overall posttest performance (66% vs. 60%)
- DFW rates reduced from 12% to 9.8%
- Number of GTAs needed reduced by 1/2
- Use of UGTAs has been extremely successful
- Cost per student reduced by 30%

FINE ARTS
Florida Gulf Coast University

CHALLENGES

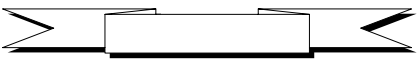
- Significant inconsistency among multiple sections
- Difficulty finding either faculty or adjuncts with the breadth of knowledge in all of the humanities
- Poor performance in this course required by all freshmen
- Growth in students and no money for new faculty

FINE ARTS
Florida Gulf Coast University

- Each module covers one aspect of the Humanities
- Each module is designed and monitored by a faculty expert in that academic area
- One course coordinator manages the course of 400+ students each term
- Undergraduate peer tutors and adjuncts guide discussion groups and evaluate longer papers
- 24/7 interactive learning resources are available anytime, any place

FINE ARTS
Florida Gulf Coast University

- Online tests are evaluated automatically
- The Intelligent Essay Assessor (after being trained) evaluates short focused essay test questions
- Students attend performances and art shows in their home community or on campus
- The model is scalable because more discussion groups can be added as needed.



FINE ARTS
Florida Gulf Coast University

<u>Traditional</u>	<u>Redesign</u>
• 25 sections (~30); 6 sections (~15) = 800	• Single section (~950)
• Taught mainly by adjuncts	• Taught by 1 faculty, 1 course coordinator, 20 preceptors
• "Course drift"	• Consistent & coherent
• \$132 cost-per-student	• \$81 cost-per-student

✓ Average exam scores increased from 70% to 85%

✓ Number of A's/B's increased from 31% to 75%

✓ DFW rate decreased from 45% to 11%

Designed for Learning

Calendar

- Workshop #1 – October 14, 2005
- Course Readiness Criteria Due – December 2, 2006
- Workshop #2 – January 27, 2006
- Submission of Proposals – March 24, 2006
- Awards Announced – April 7, 2006


For more information, see
<http://www.ctf.mnscu.edu/programs/special-initiatives/index.htm>

Or contact Richard Brown at
Richard.Brown@so.mnscu.edu

**IMPROVING QUALITY
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