

Improving Quality and Reducing Costs: Lessons Learned at Penn State and 90 Other Institutions

John T. Harwood

Teaching and Learning with Technology

Information Technology Services

Penn State

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A Word about Penn State

- PSU is large (~90K students, 6K faculty, and 15K staff) @ 24 campuses ranging from 700 students to 44K students
- Increasing % of classes taught by TA's and fixed-term or part-time faculty
- Highest tuition of any public University (~\$13K for in-state students in 2008-2009)
- Lots of courses with high DFW rates and attrition at some campuses

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Penn State Campuses



Goals for Today

- Why change anything?
- Why NCAT for Stat 200 @ PSU?
- Which elements and challenges of redesign really matter?
- Does redesign last?
- Just getting started? Attend NCAT in March 2010



Why Redesign?

- National Competitiveness
- The World is Flat and Getting Flatter
- Resource Constraints in EVERY State
- Greater Expectations about Accountability
- The Spellings Commission's Report



The Spellings Commission Asks Us About ...

1. **Accessibility:** "There are far too many Americans who want to go to college but cannot—because they're either not prepared or they cannot afford it."
2. **Affordability:** "There is little to no information why costs are so high and what we're getting in return."
3. **Accountability:** "No current ranking system of colleges and universities directly measures the most critical point—student performance and learning."



NCAT, Redesign and Penn State

NCAT Then and Now

- Program in Course Redesign (Pew, 1999-2003)
 - 30 Colleges and Universities, 50K Students
- Roadmap to Redesign (FIPSE, 2003-2006)
 - 20 more institutions
- Colleagues Committed to Redesign (FIPSE, 2006-2009), 60 more institutions
- Numerous state systems have joined
- Common focus on the 1% solution



PROGRAM IN
COURSE REDESIGN (1999-2003)

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**

**PSU's Stat
200 was in
the pilot
group, so
stay tuned!**

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A Redesigned Stat 200 Spawned Other Redesigns

- Stat 200 (NCAT)
- Biology 110 (Mellon Foundation)
- Spanish 1-3 (Textbook publisher)
- So why not fund the redesigns ourselves
— the PSU “Blended Learning Initiative”



Penn State Funds Its Own Redesigned Courses

- Landscape Architecture (online, ~350 students)
- Intro to Meteorology (online, ~350 students)
- Energy Conservation (online, ~900 students)
- Bottom line: In 2008-2009, 10% of undergrad enrollments at UP were online!



Course Redesign Is ...

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.

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A Word about Quality

- We can measure students' progress toward course objectives
- DFW is not a dirty word - it is a metric
- Quality=learning, not grade inflation
- Failure is costly - and so is ignorance



A Word About Cost

- Shhh, it's a secret!
- Nobody wants to talk about cost, esp. faculty
- Redesign cares about both - this is not an either/or



Show Me the Money (NCAT Results from 90 Universities)

- Redesigned courses reduce costs by 37% on average, with a range of 15% to 77%.
- Collectively, the 30 courses saved about \$3 million annually.
- Where do the \$\$ go?
 - Central vs. departmental?
 - Incentives
 - Sustainability
 - Funding for additional courses



What about the DFW's?

- Penn State - 12% to 9.8% (Stat 200)
- 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%

24 measured; 18 showed improvement.

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Redesign: Elements & Challenges

Five Models for 100's of Courses

1. Supplemental - Add to the current structure and/or change the content
 2. Replacement - Blend face-to-face with online activities (PSU's Statistics 200)
 3. Emporium - Move all classes to a lab setting
 4. Fully online - Conduct all (most) learning activities online
 5. Buffet - Mix and match according to student preferences (Ohio State's Statistics course)
- Bottom line: all models work! Not every model will suit every course! Your mileage may vary!



Six Principles of NCAT Redesign

- 1. *Whole course redesign.* In each case, the whole course rather than a single class or section is the target of redesign.
- 2. *Active learning.* The redesign projects make the teaching and learning process more active and learner-centered, moving students from a passive, "note-taking" role to an active-learning orientation.



Six Principles of Redesign (cont.)

- 3. *Computer-based learning resources.* Instructional software and other Web-based learning resources play an important role in engaging students with course content.
- 4. *Mastery learning.* Rather than depending on class meetings, student pacing and progress are organized by the need to master specific learning objectives according to scheduled milestones for completion.



Six Principles of Redesign (cont.)

- 5. *On-demand help*. Helping students be part of a learning community is critical to persistence, learning, and satisfaction. Many projects replace lecture time with individual and small-group activities that take place either in computer labs or online, enabling students to have more one-on-one assistance from faculty, teaching assistants and peers.



Principles of Redesign (cont)

- 6. *Alternate staffing.* Support systems of various kinds of instructional personnel allow the projects to apply the right level of human intervention to individual student problems.
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- Bottom line: Redesign focuses on learning, not teaching. Whatever model you select will build on these principles but in different ways.



Challenges of Redesign

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Challenges (1)

- Readiness (technological, administrative, curricular – even a fiscal crisis)
- Leadership (the Harkness factor and the Cyr factor – find a sparkplug)
- Project management (understanding of the model and the principles)
- Doubts that students can learn w/o me!



Challenges (2)

- Respect for data, colleagues, and students
- Capacity for success and satisfaction from new roles for faculty, students, and staff
 - “But I love to lecture” (faculty member X)
 - “Teach, dammit, teach” (student Y @ PSU)



Stat 200, Then and Now

- Enrollment today is larger than in 2000
 - 1,600 fall; 1,300 spring; 600 summer
- Required by ~40 majors
- Our redesign is the “substitution” model
- Redesign began before we had a course management system, so we had to write one. Now we use ANGEL - big PLUS!
- Leadership matters (Bill Harkness rocks!)



Stat 200, Then and Now

- Stat 200 continues to innovate
 - Efficient use of ANGEL quizzes
 - Adoption of high-stakes testing yields additional time for instruction
 - Clickers may provide additional feedback
- Stat 200 now has an online version
- Student learning remains high and DWF low; cost savings continue



Stat 200, Then and Now

- The “models” remains intact
 - Fewer lectures lead to more active learning
 - Lots of time-on-task (weekly lab exercises, homework, and 2 quizzes)
 - 93-98% of the students complete the assigned quizzes and homework (=mastery learning)
- Costs do not increase w/enrollments
- New faculty embrace the model(s)



Stat 200, Then and Now

"John, we will change class time to: two lectures and two labs. It may take up to two years to fully implement. Recent students do not seem to do as good as a job as learning one credit of material on their own. I agreed to try teaching in 100 Thomas (and maybe will start using those clickers for starters)."

Email to JTH on April 2, 2008

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In Conclusion: Keep on Plugging Away!

