Panel 3: Issues Facing Non-R1 Institutions

Case Study – Academic Transformation Initiatives at Towson University Mathematics Department

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TPSEmath
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Focus – Large enrollment and gateway courses
Became first System to adopt Course Redesign as a System
2006 – 2009, 10 projects funded for 3 years across the USM
Provided foundation for a state-wide approach to address Maryland’s higher-education iron triangle: *access, quality, and cost*
Subsequently, three strategic course redesign initiatives emerged
The USM Carnegie Course Redesign Initiative
- About 40 courses over three years
- USM institutions

A Lumina Foundation grant: “Growing by Degrees”
- Expansion to state-wide institutions
- Focused on developmental courses

MHEC grant: “Complete College America”
- State-wide
- Focused on developmental mathematics
Five Strategic Themes of the 2020 Plan

1. Enhancing Access, Affordability, and Attainment -- Helping Maryland Achieve Its 55% College Completion Goal, While Maintaining Quality

2. Advancing Maryland’s Economic Development and the Health and Quality of Life of Its Citizens

3. Transforming the Academic Model to Meet the Higher Education and Leadership Needs of Maryland’s 21st Century Students, Citizens, and Businesses
TU 2020 – Ten Priorities

#1. Academic excellence and student success

... ...

Also within this priority is a focus on academic transformation: Through academic transformation and course redesign we will provide multidimensional support to faculty as leaders in teaching, scholarship and service.
State-wide Context

- State goal – 55% of adult Marylanders will hold an associate or bachelor’s degree by 2025. This represents an eleven-point increase over the State’s current attainment rate of approximately 45%.

- Some Implications
  - Student population has changed and will continue to change
  - Delivery modes and impact on student learning outcomes
  - More pathways to success
Towson University–Math Course Redesign

• DVMT 101, DVMT 110 – part of the initial USM MCRI
• Math 115, Basic Mathematics for the Sciences – 2012
• Math 119, Precalculus – 2013

• Technology Context
  • Can technology be used to improve teaching outcomes and lower cost?
• Remedial Course Context
  • About 30% of incoming freshman students
  • Impact on cost to student
  • Impact on cost to institution/State
  • Impact on degree completion potential
  • Impact on time-to-degree (8.4 months longer)
    • (according to Complete College America study 2012)
Typical academic year enrollment

- DVMT 101: 20 course sections – 500 students
- DVMT 110: 15 course sections – 350 students
- Math 115: 30 course sections – 900 students
- Math 119: 25 course sections – 750 students

- Total: 90 sections with close to 2500 students
- Relative size: 22% of the Department academic year operation
Course Redesign Model

- **Format – Our Department Brand**
  - All use the *Replacement Model*
  - Replace one lecture hour by mandatory one hour in an open computer lab
  - Course content re-examined and partitioned into lecture-suitable and lab-suitable
  - Emphasize active learning practices – learning by “doing” vs. by “watching”
  - Mastery learning environment with on-demand guidance, individualized assistance and immediate feedback
  - Lab staffed by instructors, GTA’s and ULA’s
  - Increase class size from a cap of 30 to 40 students
One of the New Computer Labs
Success Indicators

• Pass rates improved 10–15% in all of the redesigned courses
• Average GPA improvement from 2.6 to 3.05 (Math 115)
• More positive student experience (from course evaluations)
• Increased faculty enthusiasm
• Cost saving (about 20 –30%)
DVMT 110 Pass Data

DVMT 110 Pass %

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<th>Year</th>
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Improved Learning Outcome

Grade Distribution, Math 115

- Spg 13, N=366: ABC% 86, DFWO% 14
- Spg 12, N=383: ABC% 75, DFWO% 25
- Spg 11, N=316: ABC% 75, DFWO% 25
- Spg 10, N=347: ABC% 74, DFWO% 26
Improved Learning Outcome (2) - Math 115

![Mean GPA Chart]
Impact on Cost Savings

Through

• Increased class size

• Increased success rates
Roadblocks

- Resistance to change
- Large number of adjunct faculty involved with long experience in traditional teaching and little time and incentive to invest in innovation
- Initial Lack of space for an open computer lab
Implementation Approaches

- Created Course Redesign Task Force
- Appointed a course coordinator for each course
- Hosted several major workshops (led by national experts)
- Started technology–related training sessions
- Encouraged faculty participation at relevant conferences
- Created resource manual for the instructor and a website for the students
- Created a process for the recruitment and training of ULA’s
- Publicized research and best practices on technology–based innovation and on the social context of the issues
- Made sure faculty efforts are recognized and rewarded
Sustainability

- With the redesign of several courses using the same model, a critical degree of consistency has been reached, with which sustainability will be easier.
- The CR practice has now become part of the department fabric.
- The existence of several working computer labs will assist in sustaining this model.
- We have built a committed team of faculty which forms a strong base for sustaining this model.
Other Initiatives – Math Dept at TU

- "Stretch/Accelerated" Courses
  - Combine DVMT 110 with a credit-bearing course
  - Students meet for 5 hours per week
  - Allows the completion of remediation and a college-level course in one semester
  - Have been part of the usual offerings for the last 10 years

- "Flipped-classroom Using MOOCs"
  - Incorporated a Precalculus MOOC class through a one-semester experimental study in Fall 2013