New Directions in Developmental Math

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Why do we need to change anything?
A National Problem

- 43% of all students enrolled in public 2-year colleges have enrolled in a developmental course

- 29% of all students at 4-year colleges enrolled in a developmental course

- 1 million students at public community colleges enroll in developmental courses
Math: The Barrier

- 68% of students pass all of the developmental writing courses in which they enroll.

- 71% pass all of their developmental reading courses.

- 30% pass all of their developmental math courses.
Persistence

- Only 3 to 4 out of 10 students (less than 40%) who are referred to remediation complete the entire sequence

- Almost half fail to complete the first course in their sequence

- More students fail to enroll than fail courses
How Does Maryland Compare?

- Two thirds (66.4\%) of the high school graduates in 2004-05 who enrolled in community colleges were assessed as needing remediation.

- Nearly half (48.3\%) of the high school graduates at a Maryland college or university, directly from high school, were assessed as needing remediation in math, reading or writing.
High School Graduates at MD Community Colleges

- 31.2% assessed as needing remediation in writing
- 31.4% assessed as needing remediation in reading
- 58.6% assessed as needing remediation in math
Montgomery College

- 1 in 5 students enrolls in a developmental math course each fall
- Fall 2010, 5270 of 26,000 students enrolled in developmental math courses
- 54% of all math classes offered at Montgomery College are developmental
- 74% of Spring MCPS graduates who enrolled in math Fall 2010 are taking developmental math
Likelihood of completing CLM (College Level Math)

Intermediate Algebra
- 62% of students attempt a CLM course
- 50% pass a CLM course in a standard timeframe

Intermediate Algebra for Liberal Arts
- 49% of students attempt a CLM course
- 39% pass a CLM course in a standard timeframe
Likelihood of completing CLM (College Level Math)

Elementary Algebra
- 35% of students attempt a CLM course
- 22% pass a CLM course in a standard timeframe

Prealgebra
- 15% of students attempt a CLM course
- 10% pass a CLM course in a standard timeframe
Critical Causes of Low Success Rates

- Lack of time on task
- Lack of engagement
- Inconsistent mastery of basic concepts
- Inconsistent academic standards
- Requiring all students to progress at the same pace
- Failure to take math continuously until sequence is completed
- Length of path (time) to complete CLM
MC Redesign

- Redesign and Combine Pre-Algebra and Beginning Algebra into one year-long course

- Use MyLabsPlus to Manage all sections

- Have common syllabus/standards across every section on every campus.
MC Redesign

Individualized Instruction

- Computer assisted instruction providing continuous assessment
- Timely one-on-one instruction from faculty
- Facilitates self-pacing
- One required 1 ½ hours class each week with assigned instructor
- 2 ½ hours required each week in a dedicated open math lab
Faculty work one-on-one with students to:

- Provide on-demand instruction
- Address topics when the student is ready to understand the concept
- Encourage, support, mentor, advise, and teach
MC Redesign
Mastery learning

Students work independently to:

• Rapidly advance through concepts already mastered
• Spend additional time where needed – never lost because “the class” has moved ahead
• Complete 100% of homework correctly prior to taking tests
MC Redesign

Mastery learning - Consistent High Standards

- 80% - Minimum passing score on tests
- Test retakes
  - After completing additional review (personalized assignment)
- Collegewide course developed by faculty
- Collegewide standards set and maintained by faculty
Student Reactions
Student Reactions

http://www.youtube.com/watch?v=r3mGJC4ilhl
Non-academic Challenges that Derail Students

**Early Alert Program** – Early Intervention

- Faculty work with counselors to identify students struggling for academic and non-academic reasons that interfere with their persistence and success.

  - Study skills
  - Math anxiety
  - Organizational skills

  - Financial
  - Family/Personal
Collegewide Initiative

Cooperation and Buy-In from:
- Facilities
- IT
- Enrollment management
- Financial aid
- Full- and part-time faculty
- Counselors
- Students
- Senior Administration
What’s Next?

- Extend course redesign to additional courses, including college level math courses, as appropriate.
- Encourage or mandate early enrollment in developmental math.
- Collaborate with MCPS to identify students prior to their senior year who are not on track to be college ready and offer a pathway to college readiness.
Huge Disclaimer
Anne Arundel Community College

• Redesigned courses

Some Sections of PreAlgebra (MAT 010) (MyLabsPlus)
Some Sections of Beginning Algebra (MAT 011) (MyMathLab)
Some Sections of Intermediate Algebra (MAT 012) (MyMathLab)
AACC Redesign

• Developed two week extension (E) courses for MAT 011 and MAT 012

• Developed a Note-taking guide to help students.

• Has one large and several small computer labs/classrooms
AACC Redesign

Mastery Learning

To continue students must earn:
- 90% on each homework assignment
- 80% on quizzes (unproctored without learning aids)
- 70% on tests
Hagerstown Community College

• Redesigned courses

All Sections of College Algebra (MAT 101) (MyMathLab)
All Sections of Introduction to Statistics (MAT 109) (MyMathLab)
HCC Redesign

Results We Noticed:

- Students with grades of C or higher averaged at least 45 hours on the online portion of the class.
- Students were doing the homework.
- Attention to details and not following directions were the major problems with the student software interface.
HCC Redesign

- Four hour concept
- Combined section of 40 students for 1.5 hrs. weekly lecture
- Meet with group of 20
  - For individualized instruction
  - For 1.5 hrs weekly
- Students required to go to open lab to complete an additional 1 hour of work online
What Else is Driving This?

• Governor O’Malley has set a statewide goal that by 2025 at least 55% of residents age 25-64 will hold at least 1 degree credential (Associate’s or Bachelor’s degree).

• This represents an increase over the current rate of 44%.

• To attain the level of degree awards necessary to reach the 55% goal, Maryland must go produce an additional 58,000 degrees per year, an increase of 21,000 new degrees annually by 2025.
Thank you!

- If you have any questions feel free to contact me

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