

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

MC Redesign

Faculty Interaction

- 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:

- o 90% on each homework assignment
- o 80% on quizzes (unproctored without learning aids)
- o 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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