

Bringing **New Life** to Developmental Mathematics

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Think ... write down your answer

- ***What benefits do students get from taking your developmental math courses?***

Take about 2 minutes for this task.

Outcomes of session

Those who pay attention (☺) should:

- Understand some weaknesses of the existing 'dev math' curriculum
- **Begin to accept the view that a new model is needed**
- Understand the basic ideas of the New Life model
- **Know how to get more info on the New Life model**

What is the existing DM system?

- **Pre-Algebra and/or basic math**
'middle-school-mathematics'
- **Beginning Algebra**
HS Algebra I (year course)
- **Intermediate Algebra**
HS Algebra II (year course)

So, What's the Problem with That?

A metaphor ...

500 Dance Steps for Paramedics

(same) 500 Dance Steps for Managers

(same) 500 Dance Steps for Corrections Officers

(same) 500 Dance Steps for Nurses

(same) 500 Dance Steps for Science Majors

.

Some quick data: Two Year Colleges

- **1.1 million students in developmental math ****
- **About half will pass one course**
- **The majority of students have two or three developmental courses in their 'path'**

**** CBMS 2010 data (preliminary results)**

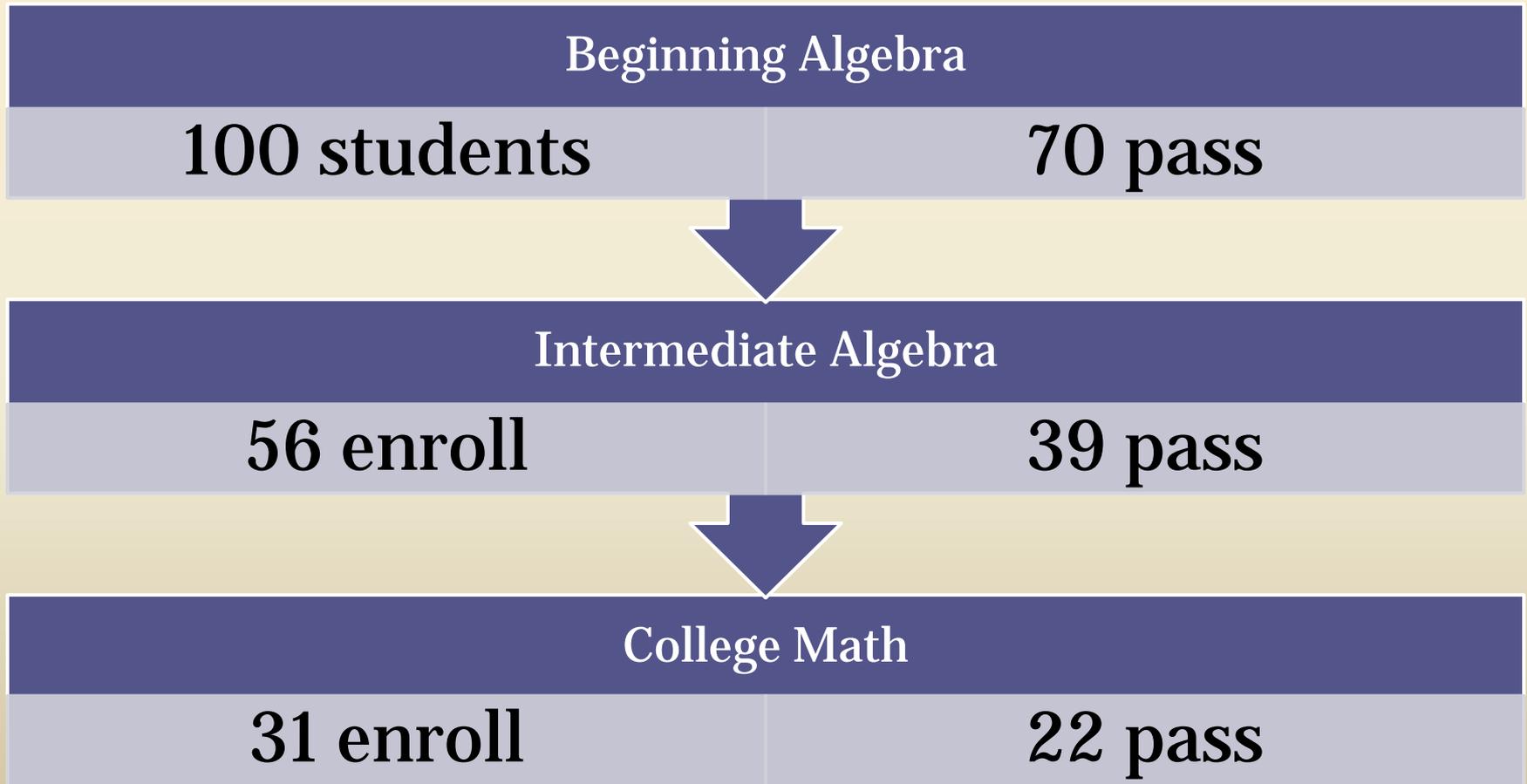
[CBMS = Conference Board of Mathematical Sciences]

Academic Truth-in-Advertising

Developmental Mathematics is ...

pre-**pre**-**pre**-**pre**-**pre**-**pre**-
calculus for the
masses

The Risk of a Longer Sequence: Assume 70% pass rate, 80% retention



More Data: Instruction (CBMS)

- Developmental mathematics instruction is less likely to involve group work (10% vs 20%+) or writing assignments (8% vs 20%+) compared to other math

{from CBMS 2005 report}

- 58% of developmental math sections are taught by adjunct faculty – compared to 30% for ‘college algebra’ and calculus

{from CBMS 2010 report}

Another Metaphor for the Problem

- The problem is **NOT** that developmental mathematics is a “bridge to nowhere”
- **The problem is that we have never designed the bridge to meet student needs**

Why do students take these courses?

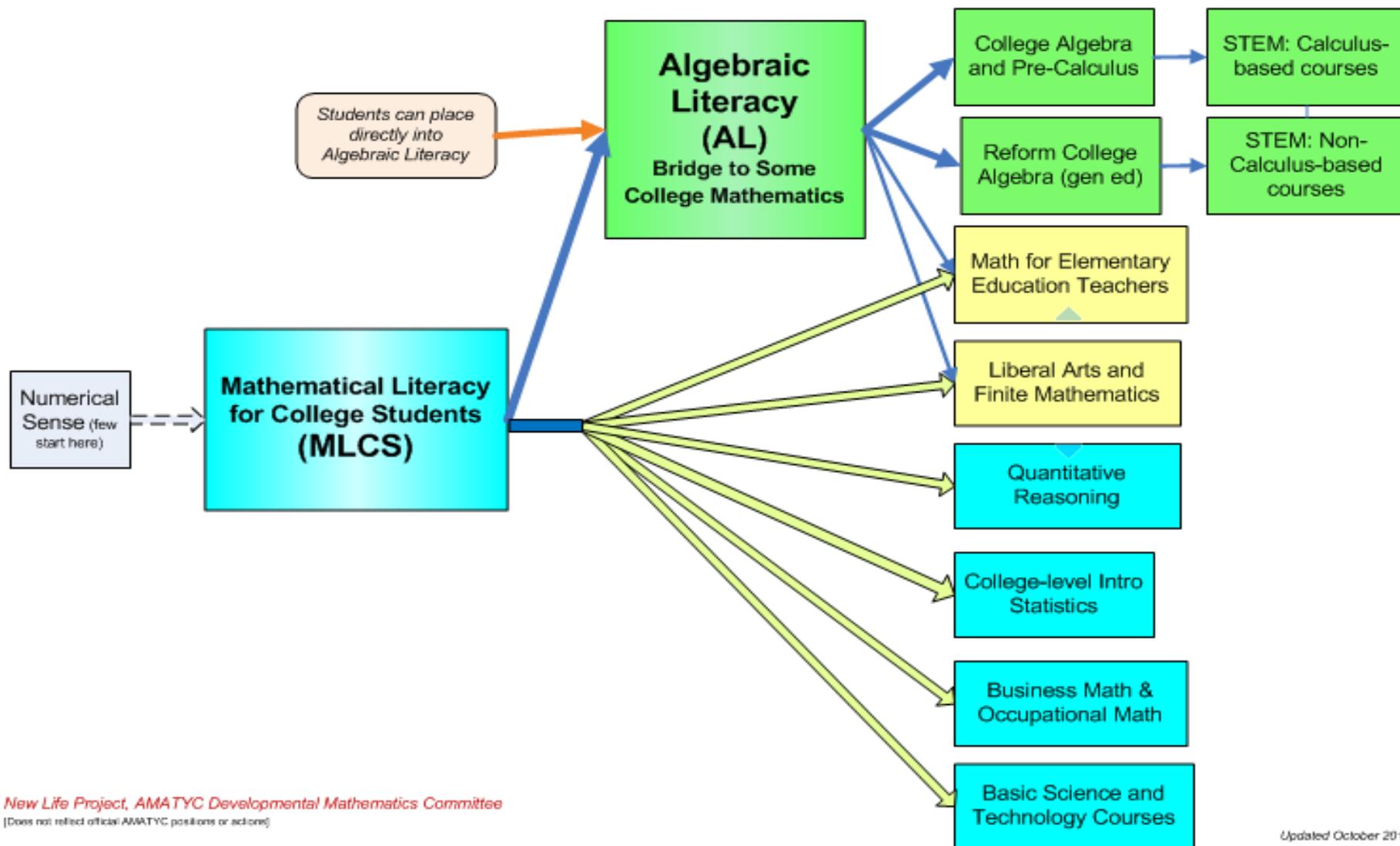
- Some (small portion) are getting ready for “serious mathematics” – pre-calculus, etc
- Quite a few are taking these courses so that they can register for their required math course (often just one)
- Many should be getting mathematical preparation for science and technology courses
- We believe all students should be ‘mathematically literate’

How many courses does it really take?

- Imagine a curriculum not controlled by a mythical school mathematics structure (arithmetic, algebra I, algebra II, etc)
- **Imagine a curriculum where the most important ideas begin in the first course**
- Imagine a curriculum where diverse student needs are honored at every level

New Vision of Mathematics Pathways: Fewer non-credit math courses for most students

from the New Life Project



The New Life Model ...

- First course at the level of beginning algebra
- **Start with a mathematical literacy course**
- Non-STEM students: only 1 developmental math course
- **Highlight critical concepts from the beginning:** relationships, reasoning, numeric & symbolic methods, and multiple representations

One 'prep' course, ready for many

- Mathematical Literacy for College Students (MLCS)
- **Prepares students for some college math, science, technology, and general academic success**
- Prerequisite skills: basic number sense

One 'bridge' course, ready for many

- Algebraic Literacy (**AL**)
- **Prepares students for STEM path mathematics and general science courses**
- Prerequisite skills: from MLCS or placement test

(Prezi)

New Life - Not Just "Better" Content

- More diversity is needed in our methodologies
- Collaborative learning ... writing to learn ... learning technologies ... technology to learn ... diverse 'applications': Parts of the new mix
- Connecting to Support Services, and Building Learning Skills with our students
- A framework: "Strands of Mathematical Proficiency" (in **Adding it Up**, Kilpatrick et al)

A Worthy Goal

- To have representative samples at the start AND end of each course

AND

- To have the majority of those who start in developmental math pass their **college** course

Details on the Courses ...

- Learning outcomes at web site (see references)
- **Implement one or both courses ... for some or all students**
- **No course required before MLCS; just-in-time remediation ... or 'boot camp'**
- Algebraic Literacy usually would include 'STEM-boosting' outcomes (unless college wants to implement two versions)

New Life for the Profession

- Inspired faculty ... inspiring students
- Skilled faculty, with a deep understanding of mathematics and learning
- Professional Development: Part of any reform (*special case: Adjunct faculty*)
- Need to develop a field of shared knowledge (*Connecting with Research Universities*)

What is the New Life Project?

- AMATYC Developmental Mathematics Committee project (began late in 2008); now a subcommittee
- Teams developed documents & ideas
- A review group provided suggestions, raised concerns (~60 people – AMATYC, MAA, NADE, others)
- Public web site for project:
<http://dm-live.wikispaces.com/>
(anybody can join; all can view)
- We seek to include everybody in the renewal of our profession

Who's Doing It? Related Projects?

- MLCS pilots and implementations are known in Illinois, Michigan, Texas and New York.
- AL pilot and implementation are known in Texas
- Related: Dana Center New Mathways
- Related: Carnegie Foundation for the Advancement of Teaching Pathways
- The core of MLCS is common to all three (New Life, Mathways, Pathways)

New Life sessions at this Conference:

- Thursday, 1:40 – 2:30pm S058
MLCS Redesigning a Pathway
Almy and Foes
- Friday, 7:50am – 8:40am S067
Ready for New Life?
Sullivan and Heymans
- Friday, 1:45pm – 3:45pm (workshop!) W08
New Life Courses (MLCS, AL)
Rotman (and the New Life team)
- Saturday, 10:45am – 11:35am S123
New Life for Intro Developmental Math
Henrikson

Finishing Touches (conclusion)

- Weaknesses of current system – not designed to meet students' needs, low results, not inspiring
- **New model is needed – more direct paths for students, meeting more needs**
- **New Life model – mathematical literacy in first course, algebraic literacy in second course**
- **More information about “New Life” online <http://dm-live.wikispaces.com/>**
- **Email at rotmanj@lcc.edu**