The Good Shepherd
California’s parable for Developmental Mathematics

MSRI CIME 2015
Katherine F. Stevenson
California State University, Northridge
Goal for today

• The necessary ingredients for guiding change
  — Know, listen, adapt, herd (and pick a good dog)
Goal for today

• The necessary ingredients for guiding change
  – Know, listen, adapt, herd (and pick a good dog)

• The different and specific forms of change required in Developmental Mathematics (California)
  – Different manifestations within different institutions
  – Different needs of different populations between, as well as within, institutions
  – Different agendas for, and purposes of, change
Goal for today

• The necessary ingredients for guiding change
  – Know, listen, adapt, herd (and pick a good dog).

• The different and specific forms of change required in Developmental Mathematics (California)
  – Different manifestations within different institutions
  – Different needs of different populations within institutions
  – Different agendas for and purposes of change

• Give example of successful and less successful attempts at change

• Discuss myths surrounding Developmental Mathematics
California’s College-Bound Story

• Private 4-year College:

• UC System:

• CSU System:

• CCCS System:

• Total Public:
California’s College-Bound Story

- Private 4-year College: 1%
- UC System: 7.2%
- CSU System: 10.5%
- CCCS System: 22.9%
- Total Public: 40.6%

http://www.cpec.ca.gov/
California’s College-Bound Story

- Private 4-year College: 1%
- UC System: 7.2%
- CSU System: 10.5%
- CCCS System: 22.9%
- Total Public: 40.6%

http://www.cpec.ca.gov/
California’s Fairy Tale: The Master Plan

- Research 1 Universities (9 campuses, 238,700 students)
  - Top 10%

- Comprehensive Universities (23 campuses, 437,000 students)
  - Top 30%

- Community colleges (112 campuses, 2.1 million students)
  - Open access to all HS graduates.
California’s Fairy Tale: The Master Plan

- Research 1 Universities (9 campuses, 238,700 students)
  - Top 10%
  - College ready (credits, courses, CASHEE, GPA, Testing)
    http://admission.universityofcalifornia.edu/freshman/requirements/

- Comprehensive Universities (23 campuses, 437,000 students)
  - Top 30%
  - College ready (credits, courses, CASHEE, GPA, Testing)
    https://secure.csumentor.edu/planning/

- Community colleges (112 campuses, 2.1 million students)
  - Open access to all HS graduates.
California’s Fairy Tale: The Master Plan

• Research 1 Universities (9 campuses, 238,700 students)
  • Top 10%
  • College ready (credits, courses, CASHEE, GPA, Testing)
    http://admission.universityofcalifornia.edu/freshman/requirements/
  • No Developmental Math – Assumed proficient

• Comprehensive Universities (23 campuses, 437,000 students)
  • Top 30%
  • College ready (credits, courses, CASHEE, GPA, Testing)
    https://secure.csumentor.edu/planning/
  • Developmental Ed – Placement tests in math and English
    • Entry Level Math Test (ELM)
    • One year completion cap

• Community colleges (112 campuses, 2.1 million students)
  • Open access to all HS graduates.
  • Developmental Ed – Placement tests in math and English
    • Assorted tests
    • Traditionally no time cap
California’s Reality Program

- Research 1 Universities
  - 7.2% (not 10%)

- Comprehensive Universities
  - 10.5% (not 20%)

- Community colleges
  - 22.9%

2013 Harvard study: 16% of LAUSD's Class of 2011 college ready
California’s Reality Program

- Research 1 Universities
  - 7.2% (not 10%)
  - All proficient

- Comprehensive Universities
  - 10.5% (not 20%)
  - 50% in Dev. Math
  - Disproportionately African American and Hispanic

- Community colleges
  - 22.9%
  - 85% in Dev. Math
  - 61% African Americans 52% Latinos into lowest levels

2013 Harvard study: 16 % of LAUSD's Class of 2011 college ready
California’s Reality Program

- **Research 1 Universities**
  - 7.2% (not 10%)
  - All proficient
  - 6 yr. grad rate ~ 80%

- **Comprehensive Universities**
  - 10.5% (not 20%)
  - 50% in Dev. Math
  - Disproportionately African American and Hispanic
  - 85% Freshman to Sophomore retention
  - 6 yr. grad rate < 50%

- **Community colleges**
  - 22.9%
  - 85% in Dev. Math
  - 61% African Americans 52% Latinos into lowest levels
  - 30% of Dev Math students complete transfer math
  - 17.4% African American

2013 Harvard study: 16% of LAUSD's Class of 2011 college ready

California’s Reality Program

- Research 1 Universities
  - 7.2% (not 10%) 
  - All proficient 
  - 6 yr. grad rate ~ 80%

- Comprehensive Universities
  - 10.5% (not 20%) 
  - 50% in Dev. Math 
  - Disproportionately African American and Hispanic 
  - 85% Freshman to Sophomore retention 
  - 6 yr. grad rate < 50% 
  - [http://www.cpec.ca.gov/](http://www.cpec.ca.gov/)

- Community colleges
  - 22.9% 
  - 85% in Dev. Math 
  - 61% African Americans 52% Latinos into lowest levels 
  - 30% of Dev Math students complete transfer math 
  - 17.4% Start at bottom and complete transfer math

2013 Harvard study: 16 % of LAUSD's Class of 2011 college ready

Dev ED in CC’s Bailey & Cho
California’s Developmental Approaches

- Research 1 Universities
  - Boot camp
  - Intensive Social Emotional Support Programs
  - Online adaptive intervention

- Comprehensive Universities

- Community colleges
California’s Developmental Approaches

• Research 1 Universities
  • Boot camp
  • Intensive Social Emotional Support Programs
  • Online adaptive intervention

• Comprehensive Universities
  • Boot camp / Early Start Math
  • Intensive first year experience
  • Continued Social Emotional Support Programs
  • Coordinated Developmental/College Level Programs

• Community colleges
California’s Developmental Approaches

- Research 1 Universities
  - Boot camp
  - Intensive Social Emotional Support Programs
  - Online adaptive intervention

- Comprehensive Universities
  - Boot camp / Early Start Math
  - Intensive first year experience
  - Continued Social Emotional Support Programs
  - Coordinated Developmental/College Level Programs

- Community colleges
  - Boot camp
  - Developmental Math Combined with Social Emotional Support programs
  - Coordinated Developmental/College Level Programs
The Integration Challenge
The Integration Challenge
The Integration Challenge
The Integration Challenge
The Integration Challenge

Different:
Definitions of Developmental Math
Placement tools
(P. Burdman)
The Integration Challenge

Different:
Definitions of Developmental Math
Placement tools
(P. Burdman)

Disconnected:
Administrations
Trusted communities
The Integration Challenge
The Integration Challenge

Coordinate:
Definitions of Developmental Math
Placement tools
(P. Burdman)

Create:
Communities of Practice
Opportunities to collaborate

Opposing Forces That Shape Developmental Education:
Assessment, Placement and Progression at CUNY CC’s
Smith Jaggars & Hodara

Your academic freedom ends where my articulation begins!
Cautionary Tale:
CSU’s Administrative push for Statistics Pathways

The plan...
• Several CCC’s approached by Carnegie to try Statway
Cautionary Tale:
CSU’s Administrative push for Statistics Pathways

The plan...
• Several CCC’s approached by Carnegie to try Statway
• Neighboring CSU’s invited
• GEAC consults CSU Mathematicians
• GEAC waives “Intermediate Algebra” Requirement
Cautionary Tale:
CSU’s Administrative push for Statistics Pathways

The plan...
- Several CCC’s approached to try Statway
- Neighboring CSU’s invited
- WHICH CSU Mathematicians consulted
- GEAC waives “Intermediate Algebra” Requirement
Cautionary Tale:
CSU’s Administrative push for Statistics Pathways

The plan...
- Several CCC’s approached to try Statway
- Neighboring CSU’s invited
- Not the CSU Council of Math Chairs
- GEAC waives “Intermediate Algebra” Requirement

What happened.
- CSU Math Council objects
- CSU students complain about unfair dual system
- UC BOARS digs in against Statway and all other “locally grown” Stat-path and quantitative reasoning pathways
Happy Ending:

The plan...

• Several CCC’s approached to try Statway
• Neighboring CSU’s invited
• CSU Math Council Consulted
• GEAC waives “Intermediate Algebra” Requirement

What is happening, eventually

• UC-BOARS Accepted Statway
  Left vague the status of other stat-pathways.
• CSU-GEAC Approved extension of waiver
• CSU Math Council – preparing a statement
Success Story: CSU’s Early Start Initiative
CSU’s Early Start Initiative

The plan...

• All CSU entering freshman must start remediation in the summer before they matriculate
• Students can do ESM at any CSU campus
CSU’s Early Start Initiative

The plan...

- All CSU entering freshman must start remediation in the summer before they matriculate
- Students can do ESM at any CSU campus
- Entry Level Math Test Equivalent score – Transparency within the system
- Credit (move up), No Credit (non-compliant), Required Progress (tried)
- Local control over what/how/when to do ESM (online, face-to-face, hybrid, boot camp,...)

Used trusted networks
Listened
Compromised
CSU’s Early Start Initiative

The plan...
• All CSU entering freshman must start remediation in the summer before they matriculate
• Students can do ESM at any CSU campus
• Entry Level Math Test Equivalent score – Transparency within the system
• Credit (move up), No Credit (non-compliant), Required Progress (tried)
• Local control over what/how/when to do ESM (online, face-to-face, hybrid, boot camp,...)

What happened.
• Students came!
• Transfers of scores happened
• Ideas were shared
• Standards were coordinated
• CSUN Freshmen retention up (73% to 78%)
Myths we can easily bust:

• There is no solution
• It’s one problem
• There is one solution

Listen, know, adapt, herd
Myths we can easily bust:

• There is no solution
• It’s one problem
• There is one solution

Listen, know, adapt, herd
More Myths

- Intermediate Algebra is essential
- Intermediate Algebra is irrelevant

\[ S = a(r_1(E_1) + (1-r_2)(E_2))/C \]

\[ E = (%\Delta \text{Demand})/(%\Delta \text{Price}) \]
\[ E(p) = -ap/(b-ap) \]
More Myths

• This is a US problem:
  – Nationwide increase in international students placing into Dev Math.

Saudi Arabia

• Test for English as a Foreign Language: Mean 60 vs 81
• TIMS bottom 3
  https://www.insidehighered.com/news/2013/05/30/international-educators-discuss-challenges-facing-saudi-students-and-strategies
• Similarly: Kuwait, Oman, Quatar
  – UK, Open University’s Bridge to Success: mathematics and learning-to-learn content so students can close gaps in their abilities and move into college-level courses
Good Shepherding

To Find Answers:

• Know
• Listen
• Adapt
• Herd

Make it easier and more attractive for students, faculty, and administrators to do the right thing than the wrong thing.