Leading Large-Scale Reform

A Case Study on Florida Mathematics Re-Design Efforts

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Objectives

1. Learn key concepts related to undertaking reform and large-scale change

2. Highlight recommendations for state policy, institutional (or local) policy and evidence-based practices designed for scale around mathematics redesign

3. Encourage participants to reflect on how their state/institution is making progress in reducing barriers to student success in mathematics
The Process
Florida Context

- Number 1 state in country for higher education (U.S. News & World Report)
- Longstanding K-20 system of articulation, student tracking (data), common course numbering
- By the numbers
  - 67 school districts
  - 28 state colleges
  - 12 state universities
Mathematics Workgroups

<table>
<thead>
<tr>
<th>High School to Postsecondary Alignment</th>
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<tbody>
<tr>
<td>Explore how high school curriculum in mathematics aligns with postsecondary expectations</td>
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<tr>
<td>• Clarify college entrance-requirements alignment with high school assessments and courses</td>
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<tr>
<td>• Examine longitudinal student data on mathematics sequencing and student success rates</td>
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<tr>
<td>• Engage high school and college mathematics faculty in dialogue about postsecondary expectations</td>
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<td>• Identify strategies that promote greater alignment</td>
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<th>FCS Mathematics Sequences</th>
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<td>Examine multiple pathways for students to enter based on programs of study as well as the re-design of course structures to maximize support for students</td>
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<td>• Identify course and institutional structures that promote and deter success</td>
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<td>• Encourage the modernization of mathematics content</td>
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<td>• Review data on student success across algebra and non-algebra pathways</td>
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<td>• Identify a sequence of courses in the context of a student’s intended transfer major/meta-major</td>
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<td>Examine how FCS curriculum in mathematics aligns with university expectations, particularly for students in transfer programs</td>
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<td>• Clarify university mathematics requirements</td>
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## Charge, Values & Deliverables

### Charge

Explore complex issues surrounding mathematics pathways to prepare: high school students for transition into postsecondary; Florida College System students for success in gateway courses aligned to their programs; and Florida College System students for transition into four-year universities.

### Guiding Values

- Transparency, collaboration, respect, diversity, evidence-based inquiry

### Deliverables

1. Cataloging evidence-based practices designed for scale
2. Developing recommendations for state policy and institutional policy and practice around mathematics re-design
Workgroup Chairs

Professor Cynthia McGinnis  
Northwest Florida State College  
**Chair:** High School to Postsecondary Alignment

Dr. Julie Phelps  
Valencia College  
**Chair:** FCS Mathematics Sequences

Dr. Tommy Minton  
Seminole State College of Florida  
**Chair:** College to University Alignment
## Milestones

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<tr>
<th>Milestone 1</th>
<th>Milestone 2</th>
<th>Milestone 3</th>
<th>Milestone 4</th>
<th>Milestone 5</th>
<th>Milestone 6</th>
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<tr>
<td>Defining the Challenges</td>
<td>Prioritizing the Challenges</td>
<td>Gathering Information</td>
<td>Linking Challenges &amp; Solutions</td>
<td>Prioritizing Solutions</td>
<td>Policy Recommendations &amp; Evidence-Based Practices</td>
</tr>
<tr>
<td>Administer survey to on key challenges &amp; synthesize findings</td>
<td>Prioritize the challenges and assign members to huddles—smaller working groups</td>
<td>Identify factors contributing to challenges, evidence &amp; drivers or root causes</td>
<td>Brainstorm &amp; evaluate potential solutions to the challenges previously identified</td>
<td>Propose and prioritize formal recommendations</td>
<td>Identify policy recommendations and evidence-based practices</td>
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Realizations

• Speaking the same language
• Lack of existing intentional communication channels
• Data distrust
• Awareness about resources
• Finger pointing
Definition Overload

- Pathways or Mathematics Pathways
- Multiple sequences
- Active Learning (and what about online active learning)
- Modeling
- Co-requisite Models
- Multiple Measures Placement
- College Algebra
- Quantitative Literacy
- Affective characteristics: attitudes, self-efficacy, motivation, tenacity, locus of control, math anxiety vs statistics anxiety, productive persistence, social belonging, mindset (grit... yikes)
- Stereotype threat
- Rigor (mathematical)
- Assessing Student Success
- Supportive Learning Environments
Challenges

- Staff turnover at state office and at institutions
- Workgroup member engagement
- Representation across education systems
- Policy changes
- Trust
- Engaging virtually (vs. face to face)
- Sustaining momentum between face-to-face gatherings
Advice

- Put faculty first
- Don’t go in with a pre-determined outcome
- Trust the process
- Listen & adapt
- Schedule face to face time
The Result
## Challenges with Mathematics Pathways

### High School to Postsecondary Alignment

- Content alignment from elementary to college
- Professional development for math teachers
- Advising students into math sequences & career paths
- Improving fundamental math skills & concepts
- Assessment of students

### FCS Mathematics Sequences

- Foundation preparedness
- Multiple sequences/pathways
- Ambiguity of math sequencing resulting in content overlap
- Placement, advising misplacement & single measure of college readiness
- Revisit prerequisites for commonality

### FCS to University Alignment

- Communication about desired math outcomes for degree programs
- Alignment of course content
- Advising of math pathways
- Aligning prerequisites for courses between institutions

Highlighted = overlap
Recommendation Types

1. Statewide Policy Recommendations
   • Laws, rules and regulations that shape public higher education in Florida
   • Broad number of stakeholders and gatekeepers
   • Multi-institutional, spanning several institutions or education delivery systems
   • Can take significant time and investment—but can result in far reaching change at scale
2. Institutional (Local) Policy Recommendations

- Organizational policy and procedures that are reflected in board rules, policy manuals, catalogs, handbooks, etc.
- Can be inter-institutional (district, college, university institution level) OR intra-institutional (department, school or administrative unit level)
- Change at this level can create quick wins and can sometimes lead to larger changes that typically are not as labor-intensive as statewide policy
3. Practice Recommendations

• Actions and activities of individuals or groups within an organization designed to execute or implement a plan or idea
• Fruit of what individuals do and is largely composed of tacit knowledge rooted in the experience of those individuals and groups
• While practices often emerge in specific institutional contexts, other organizations may benefit from adopting practices that have proven to be effective
## Considerations for Implementation

<table>
<thead>
<tr>
<th>Question</th>
<th>Statewide Policy</th>
<th>Institutional Policy (Intra and Inter)</th>
<th>Practice</th>
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<tbody>
<tr>
<td>What is changed?</td>
<td>Rule, regulation, statute, articulation agreements, curriculum frameworks, SCNS</td>
<td>Policy manual, procedure manual, course prerequisites, program requirements</td>
<td>Instruction, actions or activities of individuals or groups</td>
</tr>
<tr>
<td>Who has authority?</td>
<td>Governor, legislature, State Board of Education, Board of Governors, committees</td>
<td>Board, president, provost, administration, departments</td>
<td>Institutional leadership, departments, instructors</td>
</tr>
<tr>
<td>What is process?</td>
<td>Legislative session, rule or regulation development, committee meetings and approvals</td>
<td>Board approval, approval from leadership, shared governance process</td>
<td>Varies – could include training, professional development</td>
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Recommendations
Policy Recommendations

**Recommendation 1:** Create common mathematics pathways by aligning mathematics courses to programs, meta-majors and careers in Florida

**Recommendation 2:** Use a “multiple measures” model to help improve placement, especially in mathematics

**Recommendation 3:** Ensure mathematics prerequisites align with mathematics pathways
Policy Recommendations

**Recommendation 4:** Revise the statewide learning outcomes for developmental and gateway mathematics courses and identify essential mathematical processes

**Recommendation 5:** Encourage colleges and universities to implement instructional models (such as the co-requisite model) that place students, when appropriate, directly into college-level mathematics courses carrying general education credit
Practice Recommendations

**Recommendation 6:** Create recurring opportunities for K-20 stakeholders to promote collaboration to strengthen mathematics pathways for students via standing advisory groups/working groups and “big meetings”

**Recommendation 7:** Determine the K-12 standards that align with the postsecondary courses identified for each major or meta-major to inform student course selection in high school

**Recommendation 8:** Offer professional development opportunities for instructors
Practice Recommendations

**Recommendation 9:** Establish on-demand foundational mathematical skills modules for students to access in high school and postsecondary

**Recommendation 10:** Increase the availability of advising resources and enlist the help of mathematics faculty, where appropriate

**Recommendation 11:** Ensure parents/guardians are informed of how to support and advise high school students into mathematics sequences aligned with the student’s college and career pathway
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