

Florida Mathematics Re-Design

[#FLStudentSuccess](#)

Why is Mathematics Pathways Work Important?



Dana Center Mathematics Pathways – Structural Drivers

Dana Center, 2016

Florida Student Success Center

In 2018, the Florida College System launched the Florida Student Success Center (center) in partnership with Jobs for the Future, Helios Education Foundation and the Florida College System Foundation. Florida was the 15th state to join the national Student Success Network in supporting Florida's 28 state and community colleges in developing student-centered pathways and efforts to increase student completion rates.

Mathematics pathways re-design and content alignment were the primary initiatives in the center's first year. To achieve this goal, the Florida Student Success Center established mathematics workgroups consisting of mathematics teachers, professors and administrators from Florida's public high school system, the Florida College System and State University System.

Mathematics Re-Design Workgroups

Guiding Values

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

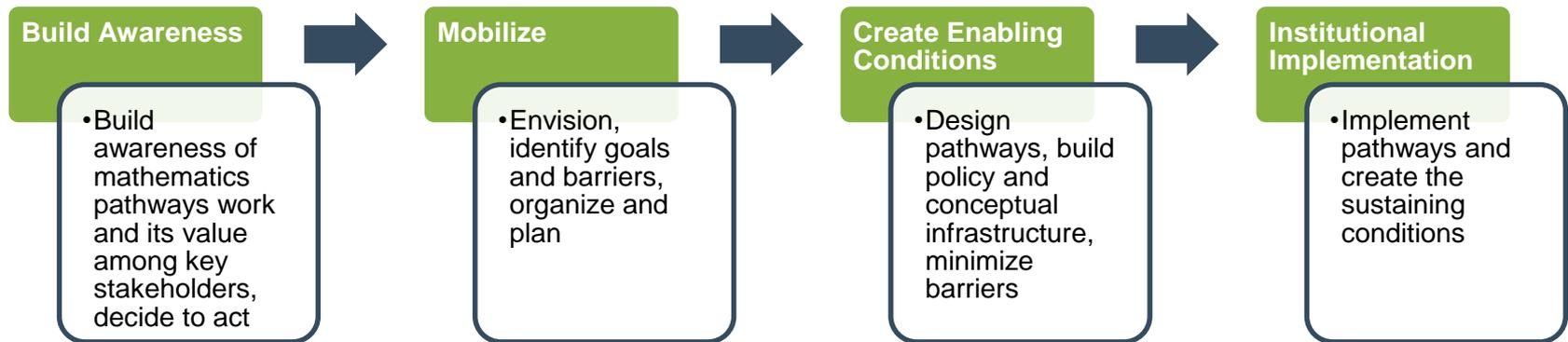
Charge

Identify current challenges in mathematics pathways and develop policy and practice recommendations to improve student achievement across education systems

Deliverables

- 1) Developing recommendations for policy and practice
- 2) Cataloging evidence-based practices designed for scale

Florida's Process of Mathematics Re-Design at Scale



Florida's Process of Mathematics Re-Design at Scale

Advancing Mathematics Pathways for Student Success, 2018; Dana Center, 2016; Summit on Mathematics Pathways, 2017

Role of Workgroups

High School to Postsecondary

Explore how high school curriculum in mathematics aligns with postsecondary expectations

- Clarify college entrance-requirements alignment with high school assessments and courses
- Examine longitudinal student data on mathematics sequencing and student success rates
- Engage high school and college mathematics faculty in dialogue about postsecondary expectations
- Identify strategies that promote greater alignment

FCS Mathematics Sequences

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

- Identify course and institutional structures that promote and deter success
- Encourage the modernization of mathematics content
- Review data on student success across algebra and non-algebra pathways
- Identify a sequence of courses in the context of a student's intended transfer major/meta-major

FCS to University Alignment

Examine how FCS curriculum in mathematics aligns with university expectations, particularly for students in transfer programs

- Clarify university mathematics requirements
- Examine the longitudinal student data on mathematics sequencing and student success rates
- Engage FCS and SUS mathematics faculty in dialogue about postsecondary expectations
- Identify strategies that promote greater alignment

Workgroup Toolkit

Milestones	Activity	Description
Milestone 1	Defining the Challenges (Pre-Work)	Administer survey to solicit workgroup feedback on key challenges related to mathematics re-design
Milestone 2	Prioritizing the Challenges	Prioritize the challenges and assign members to huddles
Milestone 3	Gathering Information	Complete <i>Template for Gathering Information</i>
Milestone 4	Linking Challenges and Solutions	Complete <i>Template for Brainstorming Solutions</i>
Milestone 5	Prioritizing Solutions	Prioritize solutions through survey
Milestone 6	Drafting Policy & Practice Recommendations	Complete <i>Template for Policy and Practice Recommendations</i> and <i>Template for Best Practices</i>
Milestone 7	Share Recommendations & Best Practices	Present findings at one-day institute

Arriving at Recommendations

Identify the problem

What are the challenges associated with math pathways implementation?

What evidence do we have that this problem exists?

What is the root cause of the problem?



Brainstorm solutions

What are the promising solutions to address this problem?

Have the solutions been implemented elsewhere and with what success?

What are the highest priority solutions?



Develop recommendations

What statewide policy solutions would address the problem at scale?

What institutional policies would address this problem at the local level?

What practices would address this problem?

Types of Recommendations



Statewide Policy. Far reaching results at scale, across educational delivery systems.

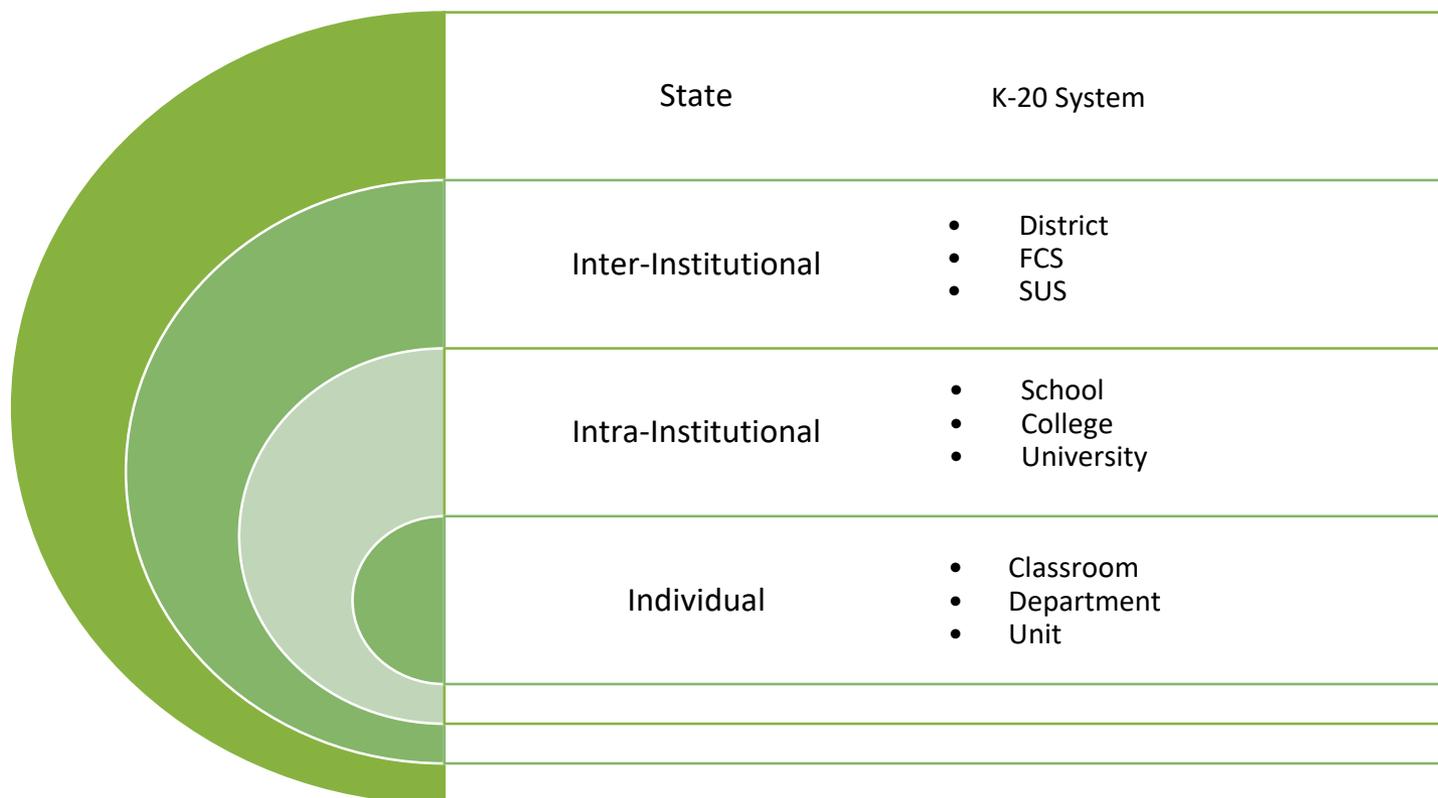
Institutional Policy. Larger changes within an institution (intra) and between institutions (inter).

Practice. Instruction, actions or activities that produce results (institutional or individual).

Guiding Questions to Inform Recommendations

Question	Statewide Policy	Institutional Policy (Intra and Inter)	Practice
What is it that we're trying to change?	Rule, regulation, statute, articulation agreement, curriculum framework, Statewide Course Numbering System	Policy manual, procedure manual, course prerequisites, program requirements	Instruction, actions, or activities of individuals or groups
Who has authority to make the change?	Governor, legislature, State Board of Education, Board of Governors, committees	Board, president, provost, administration, departments	Institutional leadership, departments, instructors
What is the process for implementing change?	Legislative session, rule or regulation development, committee meetings and approvals	Board approval, approval from leadership, shared governance process	Varies – could include training, professional development

Types of Recommendations



Key Themes

- **Pathways**
 - Creating mathematics pathways by aligning mathematics courses to educational/career pathways and identifying appropriate course sequencing/curriculum mapping for those pathways
- **Re-Design**
 - Implementing re-design of mathematics curriculum, courses or instructional methods
- **Advising and Placement**
 - Advising or counseling students into math sequences that are aligned to the academic/career pathway

Key Themes Continued

- **Learning**
 - Examining institutional SLOs for alignment with statewide SLOs, determining prerequisite skills/courses required and implementing innovative pedagogical practices to support students
- **Professional Development**
 - Providing opportunities to support instructors and advisors in areas such as active learning, critical thinking, problem solving, pathways and placement into appropriate math courses/pathways
- **Communication and Engagement**
 - Engaging and communicating with stakeholders both within and external to the institution, about mathematics curriculum, content alignment and/or student preparedness

Recommendation 1:

Create common mathematics pathways by aligning mathematics courses to programs, meta-majors and careers in Florida.

Students need different mathematics skills depending on their programs of study. Many institutions still use the college algebra pathway as the primary pathway for their students, even if the liberal arts mathematics/statistics pathway may be more appropriate for their degrees. Not all students are well served by traditional algebra-based calculus sequences; in fact, research shows that courses that are meaningful to students increase their engagement, which, in turn, increases their success.

Recommendation scope: Policy, statewide, inter-institutional

Recommendation 2:

Use a “multiple measures” model to help improve placement, especially in mathematics.

Research shows that more community college students pass college-level courses in mathematics and English when multiple measures (e.g., high school grade point average, placement test scores, level of courses taken, etc.) are used to appropriately place students.

Recommendation scope: Policy, statewide

Recommendation 3:

Ensure mathematics prerequisites align with mathematics pathways.

In 2014, the American Mathematical Association of Two-Year Colleges (AMATYC) released a position statement stating that the prerequisite of any mathematics course should be a course that prepares a student to succeed in that course for which it is a prerequisite; thus, "prerequisite courses other than Intermediate Algebra can adequately prepare students for courses of study that do not lead to Calculus." MAT 1033 Intermediate Algebra may not be the best prerequisite course for statistics or quantitative mathematics courses. A common set of prerequisite courses will provide consistency in successfully preparing students for sequential courses.

Recommendation scope: Policy, statewide, intra-institutional

Recommendation 4:

Revise the statewide learning outcomes for developmental and gateway mathematics courses and identify essential mathematical processes.

By revisiting mathematics courses, and establishing a statewide list of mathematics processes, there will be an increased awareness of essential learning outcomes and processes, more consistency of instructive practices statewide and stronger lines of communication between K-12 and postsecondary educators. The purpose of this revision is to establish the essential learning outcomes and processes for a student entering any gateway mathematics courses.

Recommendation scope: Policy, statewide, intra-institutional

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.

Nationally, data indicates that co-requisite courses provide students with the support they need to complete college-level mathematics courses. A co-requisite model that incorporates developmental education skills in credit-bearing courses should be an additional option for students to acquire foundational knowledge and skills.

Recommendation scope: Policy, intra-institutional

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.”

Collaboration across K-12 and postsecondary is critical to ensuring a seamless pathway for students to be successful in mathematics. It is important to intentionally create opportunities to open the lines of communication between secondary and postsecondary about how standards are taught and assessed.

Recommendation scope: Practice, statewide, inter-institutional

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.

It is useful for students to have an understanding of how what they are learning applies to what they will face outside the classroom now or in their future; showing how mathematics topics have practical application can inform students of which courses to take in high school.

Recommendation scope: Practice, statewide, inter-institutional. While the current recommendation is related to practice, it may be beneficial to explore this recommendation as a policy in the future.

Recommendation 8:

Offer professional development opportunities for instructors.

Professional development equips instructors with practical classroom strategies and instructional methods that support student development of mathematics skills. It can also seek to build instructor depth in content.

Recommendation scope: Practice, statewide, intra-institutional

Recommendation 9:

Establish on-demand foundational mathematical skills modules for students to access in high school and postsecondary.

Students need an opportunity to brush up on foundational mathematics skills and content. On-demand modules specific to Florida provide review and assessment of foundational learning outcomes.

Recommendation scope: Practice, statewide. While the current recommendation is related to practice, it may be beneficial to explore this recommendation as a policy in the future.

Recommendation 10:

Increase the availability of advising resources and enlist the help of mathematics faculty, where appropriate.

Students need more opportunities and support for selecting the pathway to achieve career goals with the help of advising resources. Advisors with specialized knowledge would be a great benefit in helping students navigate their mathematics pathways.

Recommendation scope: Practice, intra-institutional

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.

As students enroll in high school and begin to consider college and career, it is important for parents/guardians to be informed of their student's course scheduling plans and the mathematics sequences that are aligned with a student's pathway.

Recommendation scope: Practice, intra-institutional

Next Steps

July 2019	Florida Student Success Center publishes recommendations and begins the public review period
August-September 2019	Florida Student Success Center solicits interest for participation in the steering committee
October 2019	Public review period closes
November 2019	Steering committee meets to review recommendations and feedback, develop action plan and form project teams
January 2020	Project teams begin work

Recommendations Feedback

- Please visit <https://www.research.net/r/MathRecommendationsFeedback> to provide feedback on the Mathematics Re-Design Recommendations
- Feedback will be collected through October 31, 2019