



Ohio Mathematics Initiative

Fiscal Year 2019 Progress Report

Ohio

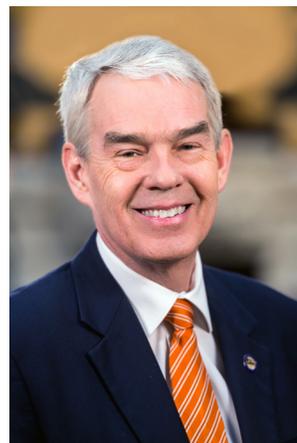
Department of
Higher Education

A Message from the Chancellor

The past year has been one of great successes and partnerships within the Ohio mathematics community. After six years of continued dedication, faculty members within the Ohio Mathematics Initiative (OMI) are still committed to their goal of rethinking mathematics in Ohio.

In the last year, OMI faculty have been:

- Disseminating information about active learning pedagogy through professional development opportunities and shared experiences from the classroom.
- Collaborating with the Ohio Department of Education on the development of a Quantitative Reasoning High School Transition Course.
- Collaborating with the Ohio Department of Higher Education and the Ohio Department of Education to work on mathematics pathways that make sense for students throughout their P-16 journey.
- Researching co-requisite remediation strategies and implementation models in collaboration with the Bridges to Success and Strong Start to Finish initiatives.



Many have viewed mathematics as a barrier to student success. I am confident the efforts of the Ohio Mathematics Initiative will guide students to the right mathematics for their chosen careers, and provide the support and resources needed along the pathway to completion.

I support the efforts of the Ohio Mathematics Initiative as it continues to make changes in support of our statewide attainment goal, which aims to have 65 percent of Ohioans between the ages of 25 and 64 with a degree, certificate, or other postsecondary credential of value by 2025.

Randy Gardner
Chancellor
Ohio Department of Higher Education

The Initiative in Review

The Ohio Mathematics Initiative is continuing to make progress as it wraps up its sixth year of rethinking mathematics in Ohio. The initiative is governed by the Chairs/Leads Network, whose membership consists of the mathematics department chairs or leads of Ohio's 36 public colleges and universities. In addition, there are five working subgroups that are composed of the Chairs/Leads themselves or faculty they have nominated as subgroup members. Each subgroup has a liaison at the Department of Higher Education (ODHE) with the exception of subgroup 5, which has not only liaisons from both ODHE and the Ohio Department of Education (ODE), but also K-12 teachers among its membership. The working areas of each subgroup have evolved over the years, but have remained true to the essential components set forth in [Rethinking Postsecondary Mathematics: Final Report of the Ohio Mathematics Steering Committee](#) from March 2014. The essential components included:

1. Developing high-quality, entry-level courses and pathways
2. Promoting the effective transfer of course credits
3. Building an Ohio mathematics community
4. Collecting, analyzing, and sharing relevant data
5. Aligning secondary and postsecondary mathematics content and instruction



Activities of the Chairs/Leads Network

Chairs/Leads Network Meetings

The Chairs/Leads Network had two meetings during the fiscal year, both held in Columbus at The Ohio State University. The first meeting was on November 2, 2018. At this statewide meeting, ODHE provided updates on the Strong Start to Finish and Ohio Guaranteed Transfer Pathways initiatives. A representative from each of the OMI subgroups provided a progress report on current projects. The Chairs/Leads also had an opportunity to discuss and identify goals for the next academic year, examine updates in Business Statistics and Introduction to Statistics courses, and revisit the importance of teaching and offering Quantitative Reasoning courses.

The second meeting was on April 26, 2019. ODHE shared a summary of the mathematics Chairs/Leads and faculty surveys, upcoming professional development opportunities for Quantitative Reasoning, and baseline research on gateway mathematics courses. Each of the five subgroups provided project updates. ODE concluded the meeting by providing an update on the Quantitative Reasoning High School Transition Course.

Surveys

The Chairs/Leads Network collaborated with the Ohio Department of Higher Education to survey the 36 institutions inquiring about their interests in regards to the OMI, and to collect information about mathematics courses at the responding institutions. One survey was targeted specifically to identify the priorities of the Chairs/Leads themselves. The second survey determined the interests of faculty within each mathematics department. The information gathered from the surveys will help identify the priority of current and future projects, and assist with locating mathematics leaders in the community. Responses were received from 33 Chairs/Leads and 122 faculty.

Quantitative Reasoning Professional Development Workshop

One of the most requested items from the surveys was professional development assistance with the Quantitative Reasoning (QR) course. As a result of the request, a Quantitative Reasoning Professional Development Workshop was hosted by the Ohio Department of Higher Education and offered by the Charles A. Dana Center from the University of Texas Austin on April 25, 2019. The Dana Center shared research-based trends in QR, and through an interactive session, discussed best practices in course design, including pedagogy, course culture, and incorporation of psychosocial factors. Experienced Ohio QR faculty members also shared their knowledge teaching QR, describing projects completed in class, methods utilized for culture-setting, and common

challenges in teaching QR. After the panel discussion, there were sessions dedicated to numeracy, probability, writing in QR, and modeling. More than 60 faculty registered to attend the workshop.

Focused Online Collaborative Interactions (FOCI)

The Ohio Department of Higher Education is sponsoring a professional learning opportunity for faculty called Focused Online Collaborative Interactions (FOCI) offered by the Dana Center. This online workshop consists of six, two-hour-long sessions designed to provide faculty with an introduction to student-centered learning, effective student discourse, and collaboration. The six sessions include:

1. Establishing a culture of student-centered learning
2. Promoting discourse through multiple problem-solving strategies
3. Questioning techniques to promote deep, connected learning
4. Managing an effective student-centered learning environment
5. Assessment in a collaborative classroom
6. Establishing an effective environment on the first day and week



Registration for the workshops started immediately following the QR Professional Development Workshop. The workshops began at the end of August 2019 and will run until mid-November 2019.

Collaboration with the Ohio Department of Education and Ohio Department of Higher Education

Ohio's Participation in the CBMS Pathways Forum and Algebra 2 Equivalency Initiative

The State of Ohio (represented by staff members from the Ohio Department of Education and the Ohio Department of Higher Education, as well as Ohio high school mathematics teachers and Ohio college and university mathematics professors) participated in the Conference Board of Mathematical Sciences (CBMS) Pathways Forum, in conjunction with the Charles A. Dana Center at the University of Texas, Austin and Achieve. The purpose of the forum was to initiate a multi-state effort directed at creating a coherent and seamless transition between high school and college mathematics. CBMS facilitated discussion among state leadership teams enabling them to draw on the expertise of the CBMS societies and the Dana Center to form task forces working to coordinate efforts across grades 11-14. These task forces will help states by suggesting policies and practices for mathematics instruction that contribute to successful completion without reducing quality. The CBMS Pathways Forum focused on responding to the changing role of mathematics in the economy, ensuring college readiness today and tomorrow, and articulating the mathematical pathways that will serve all students. Presentations and discussions covered topics such as calculus, dual credit, equity, creating math transition courses, co-requisite remediation, and Algebra 2 equivalency.

As Ohio is further along in these discussions compared to many states, Stephanie Davidson, Vice Chancellor of Academic Affairs at ODHE, participated in a panel where she discussed the Ohio Mathematics Initiative. She highlighted the work of the OMI related to defining three entry-level mathematical courses at the collegiate level, guaranteed transfer of courses, aligning mathematics courses with different disciplines, developing co-requisite/accelerated remediation models, and developing and piloting a 12th grade transition course.

During the forum, each state was given time to define a pressing problem statement concerning mathematics education in the state. Ohio is investigating a partnership with the Dana Center and Education Strategy Group (ESG) surrounding Algebra 2 equivalency titled "Strengthening K-12 & Higher Education Math Pathway Alignment in Ohio." Ohio's state team developed an initial draft of a problem statement and goal:

Problem Statement

Algebra 2 is not meeting the needs of all students. Strategy 10 of Each Child, Our Future (ODE's strategic plan) stresses multiple pathways to future success using multiple ways to demonstrate the knowledge, skills, and dispositions needed beyond graduation. Although all students need the rigorous thinking and reasoning processes that underlie the Algebra 2 content, not all students need the actual Algebra 2 content for their future career and educational endeavors.

Goal

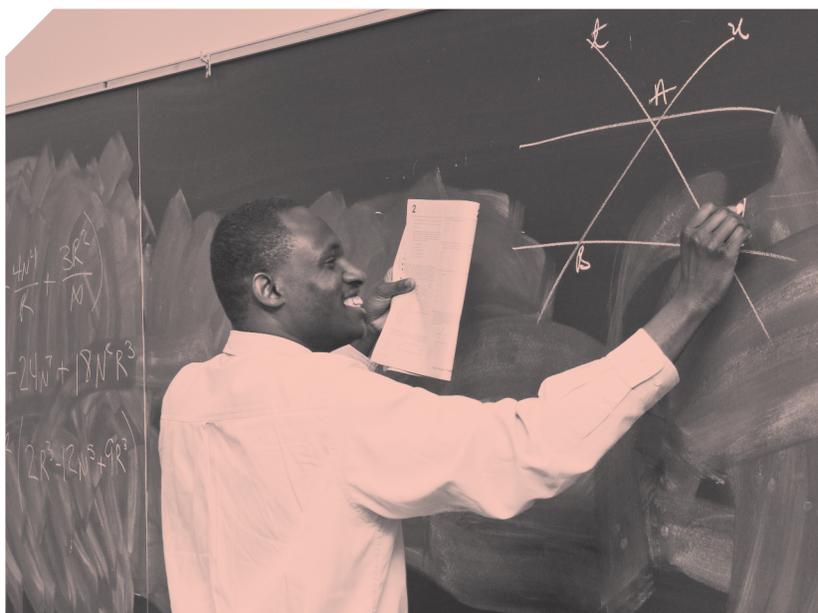
Expand high school mathematics options that prepare students for future success by:

- Evaluating the coherence between K-14 Math Pathways in college and career;
- Rethinking current Algebra 2 to STEM Pathways by leveraging Algebra 2 Equivalency (A2E); and
- Maintaining rigor in Algebra 2 Equivalency (A2E) courses.

There are plans for the Forum to continue to meet over the next 18 months.

Ohio Strong Start to Finish

The Ohio Strong Start to Finish (SSTF) network established co-requisite remediation in math and English as one of its four priority action areas, along with clearly structured programs; aligning gateway math and English to the major; and developing advising structures to support student completion. SSTF leadership leveraged the work of the [Ohio Math Initiative](#) and the [Bridges to Success](#) work to bring co-requisite remediation to scale in both community colleges and universities. In addition to convenings provided by the OMI and Bridges teams, the SSTF meetings also included breakout sessions and roundtable discussions on co-requisite remediation as part of broader student success initiatives.



2018-2019 Collaboration around Essential Components

The past year continued to be a busy year for the subgroups working on their respective goals.

Subgroup 1 – New and Alternative Pathways

Subgroup 1 hosted a Symposium on Co-Requisite Approaches in Mathematics on Friday, October 26, 2018. More than 130 people attended including faculty, advisors, registration personnel, and administrators representing more than 30 Ohio public colleges and universities. The event was an opportunity for attendees to learn and share how institutions are implementing co-requisite strategies for students to be successful in mathematics and persist to a degree.

Subgroup 1 revealed the results of its research on best practices in co-requisite remediation across the United States, as well as approaches in Ohio. After months of work and data compilation, the group identified three co-requisite developmental models for mathematics:

1. **Paired Course Model:** Provides support skills in a separate course aligned to the learning objectives of the gateway course. The separate course is paired with the gateway course and delivered in the same semester.
2. **101 Plus Model:** Offers academic support as an extension of the gateway course.
3. **Technology-mediated Model:** Requires students to complete online lab support.

The symposium also included panels on the following topics:

- Curriculum and degree programs of study – Panel participants shared their experiences in developing and implementing curricula for co-requisite support. The presenters highlighted course success rates and instructional practices.
- Challenges and solutions in course registration and transcription – Panel participants highlighted creative ways to overcome technical limitations and engage stakeholders across the institution for successful implementation of co-requisite courses.
- Advising processes and communication with students – Panel participants shared advising structures and communication examples from their institutions.

Presentations from the symposium are available at <https://www.ohiohighered.org/B2S/co-requisite-remediation> under “Presentations and Conferences.” The event was also part of the Bridges to Success initiative sponsored by the Helmsley Foundation.

Looking ahead: In the upcoming year, Subgroup 1 is planning a series of regional conferences throughout the state to create opportunities for institutions to plan co-requisite strategies with their most frequent transfer partners.

Subgroup 2 – Revision of the Ohio Transfer Module (OTM) Criteria

During fiscal year 2019, Subgroup 2 focused on drafting future learning outcomes for Ohio Transfer Module courses, as well as reminding faculty statewide to submit Quantitative Reasoning (QR) courses (TMM011) and sharing materials within the Quantitative Reasoning Knowledge Base platform. At the end of FY19, 16 of the institutions have QR courses approved for the Ohio Transfer Module (OTM) with an additional five institutions in the process of seeking approval. The efforts of Subgroup 2 have led to many new account requests for the QR Knowledge Base this past year.

Looking ahead: Subgroup 2 will continue to work on drafting learning outcomes for Life Sciences Calculus, Technical Mathematics, and Elementary and Middle Childhood Education pathways with endorsement surveys expected in fall 2019. Additionally, the subgroup has identified the need to create a survey and working group to develop a mathematics pathway for nursing. The subgroup will also continue to explore Calculus restructuring and best practices. Finally, in the upcoming year the group intends to examine the option of working with secondary faculty on redesigning College Algebra to align to Algebra II pathways.

Subgroup 3 – Communication, Outreach, and Engagement

Subgroup 3 continued to engage the mathematics community through presentations at the conferences of mathematical professional organizations. The group also collaborated with Subgroup 1 on the creation of a Fast Facts publication to share information with the mathematics community on co-requisite models. This year marked the beginning of a series of webinars designed to provide information of interest and value to the mathematics community. The first webinar was a joint effort with the Ohio Open Ed Collaborative about Open Educational Resources (OER). Webinar attendees learned about the OERs that are available in mathematics as a result Ohio Open Ed Collaborative, and how to access those resources. Subgroup 3 members hope that leveraging electronic technologies such as webinars will allow a broader reach into the community, thereby encouraging involvement of faculty that may not be in regular attendance at professional functions.

Looking ahead: Subgroup 3 is planning to continue engaging members of the mathematics community with presentations to professional organizations about the ongoing work of the various OMI subgroups. In addition, the subgroup's series of webinars will continue with others planned for mid-fall and mid-spring of the upcoming year.

Subgroup 4 – Data Collection, Analysis, and Sharing

Subgroup 4 received a large dataset from the state Higher Education Information (HEI) system that includes the 2012-2013 cohort of students with a six-year graduation rate. These data represent the state of mathematics in Ohio before the beginning of the Ohio Mathematics Initiative.

Looking ahead: Subgroup 4 would like to collect survey data from individual mathematics departments to gain information about their greatest successes and challenges to date. A new co-chair will be chosen in the next few months as a replacement for a co-chair who moved on to a new opportunity. In addition, Subgroup 4 will need additional cohort data from the state within the next couple of years to collect intermediate data now that the OMI has been working for a few years.

Subgroup 5 – Alignment between Secondary and Postsecondary Content and Instruction

Subgroup 5 has been collaborating with the Ohio Department of Education and local high school educators on the creation and piloting of a Quantitative Reasoning High School Transition Course. The transition course is a year-long course that focuses on quantitative reasoning, problem solving, and modeling within real-world contexts that is taught using active learning pedagogy with the integration of technology.

Looking ahead: Subgroup 5 will continue to collaborate with ODHE on the implementation of the transition course as it moves from the pre-pilot to the pilot phase during the 2019-2020 school year. Subgroup 5 is also planning to add additional teachers from K-12 to its membership. The additional members will provide valuable insight as the state begins examining high school pathways and Algebra 2 equivalency (A2E).

In Memoriam - Donald Van Meter

The Ohio Mathematics Initiative (OMI) lost a member of the community this past spring. Don Van Meter was a consultant with the Ohio Department of Higher Education working on the OMI. His consulting firm was hired to assist with telling the story of the OMI. Over the years, Don created many documents and reports for the OMI. He was responsible for drafting and designing the final report of the Ohio Mathematics Steering Committee, the Up 2 Date summaries from the Chairs/Leads Network meetings, and the OMI Annual Reports. Don was a talented communicator and dedicated public servant.

[View Don's Obituary](#)



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