Ohio Mathematics Initiative

Fiscal Year 2021 Annual Report
The Initiative in Review

The Ohio Mathematics Initiative (OMI) is a collaborative effort composed of mathematics faculty members from Ohio public colleges and universities and Ohio high schools that seeks to revisit and rethink mathematics courses, curricula, and their relationships with other disciplines. This past year, ending on June 30, 2021, marked the eighth year of work for the OMI. This dedicated group of collaborators accomplished many things to keep the goals of the initiative moving forward to benefit the students of Ohio, even during the challenges of the COVID-19 pandemic.

During the past year, the various subgroups of the OMI have continued working in their focus areas. Subgroup 1 has continued to look at co-requisite options and postsecondary mathematics pathways. Subgroup 2 has been working on new and updated learning outcomes for mathematics courses in the Ohio Transfer 36 (formerly called the Ohio Transfer Module). Subgroup 3 has been busy with outreach efforts to various parts of the mathematics community, and Subgroup 5 has been working closely with the Ohio Department of Education (ODE) on the development of high school mathematics pathways and Algebra 2 equivalent courses.
Chairs/Leads Network Meetings

The Chairs/Leads Network held two statewide meetings during the fiscal year; both were held digitally to adapt to the constraints of COVID-19. The first meeting was held on October 30, 2020. At this meeting, representatives from OMI Subgroups 1-3 and Subgroup 5 provided progress reports on current and future projects. ODHE provided updates to attendees on Strong Start to Finish. The chairs/leads also had an opportunity to receive updates on the mathematics outreach initiative, Algebra 2 course equivalencies, and held discussions around informing institutional campuses about mathematics changes. The October 30, 2020 OMI Chairs/Leads Network meeting minutes can be accessed here.

The second meeting was held on May 7, 2021. OMI Subgroups 1, 2, and 5 held discussions and updates surrounding Co-requisite Calculus courses, ODE/ODHE collaboration around high school mathematics initiatives, and statewide mathematics course development. OSU updated the chairs/leads on progress of the mathematics outreach initiative. The meeting concluded with statewide discussion on online teaching in the era of COVID-19, textbook development, Ohio Transfer 36 Diversity, Equity, and Inclusion dual approved mathematics courses, and the identification of mathematics areas that need further review. The May 7, 2021 OMI Chairs/Leads Network meeting minutes can be accessed here.
Collaboration with the Ohio Department of Education and Ohio Department of Higher Education

Collaboration on Mathematical Modeling and Reasoning

ODE, in conjunction with ODHE, sent out an invitation to locate higher education collaborators in preparation for the expansion of the Mathematics Modeling and Reasoning course. The course was piloted in the 2018-2019 school year, a developmental pre-pilot was implemented in preparation of the full pilot in the 2019-2020 school year and an expansion in 2020-2021. The Mathematics Modeling and Reasoning course is a quantitative reasoning course designed to promote reasoning, problem solving, and modeling through thematic units focused on mathematical practices while reinforcing and extending content in Number and Quantity, Algebra, Functions, Statistics and Probability, and Geometry. It is a year-long course taught using student-centered pedagogy. During the 2020-2021 school year, it serves as a fourth-year mathematics course to assist high school students to become ready to transition to college mathematics in one of three pathways (Quantitative Reasoning, Introductory Statistics, or STEM Preparation).

Higher education collaborators are provided with a small stipend and expected to:

• Attend summer orientation and professional development activity for high school collaborators.
• Speak to pilot teacher’s students about mathematics in college, explaining the multiple math pathways and gateway courses and expectations of mathematics for different degree programs.
• Communicate with high school collaborator(s), including the following:
  » Review context lessons and discuss suggestions for enhancement
    ○ Collaborate at least twice in the fall, twice in the winter, and twice in the spring
  » Co-teach a lesson
    ○ Collaboration at least once in the fall and once in the spring
  » Suggest reinforcement activities
  » Participate in online professional learning sessions.
• Visit classrooms periodically to endorse the transition from high school to college.

The following institutions had collaborators participating during the past year:

- Central State University
- Columbus State Community College
- Cuyahoga Community College
- Kent State University
- Lorain County Community College
- Northwest State Community College
- Ohio University
- Rhodes State College
- Shawnee State University
- Sinclair Community College
- University of Cincinnati
- The University of Toledo
- Youngstown State University
Ohio Strong Start to Finish

On June 30, 2021, the Ohio Strong Start to Finish (SSTF) initiative completed its final year of a three-year project to support developmental education reform and student success at Ohio public community colleges and universities. SSTF is a collaboration between the Ohio Department of Higher Education, the Inter-University Council, the Ohio Association of Community Colleges, and the 18 community colleges and 12 universities in Ohio that have committed to implementing the following priorities: ensuring that clearly structured programs of study exist for all majors; aligning redesigned gateway mathematics and English courses to all programs of study; implementing co-requisite remediation at scale in mathematics and English; and building advising structures to ensure all students register for coursework in sequences to meet their goal. In the fall, institutions reported on the activities funded by the first and second rounds of the Campus Level Action and Success Support (CLASS) grants. The majority of funds were used to support curriculum development, scale co-requisite remediation in English and mathematics, and provide professional development, but by fall 2020 many institutions had been unable to complete their activities due to the pandemic, so many requested budget revisions or time extensions.

The Fall Learning Network Convening, held virtually this past year, had more than 360 participants with representatives from every Ohio public institution of higher education. Bryan Sponsler, Ed.D, vice president, Education Commission of the States, provided opening remarks. Dr. Tia Brown McNair, Dr. Chris Hutt, Sarah Truelsch, and Dr. Katie Hern gave additional keynotes. The two-day event also included presentations by more than 45 faculty and staff from Ohio institutions. The SSTF Capstone Convening on May 20, 2021 was also held virtually and served as the wrap-up for the SSTF grant with all 30 institutions sharing accomplishments and successes from the past three years. Each institution provided a summary of a significant accomplishment on its campus summarizing work completed as part of the Strong Start initiative. These campus highlights can be seen here.

SSTF’s partnership with Sova produced a series of webinars during the year along with workshops by Complete College America on Co-requisites, and Motivation Lab on Mind Set. Ohio SSTF received an additional grant to support faculty professional development statewide. The grant enabled more than 100 faculty members who teach co-requisite mathematics or English courses to participate in the Association of College and University Educators (ACUE) Effective Online Teaching program. The courses started in September and ended in May, concluding with a pinning celebration in June.
Ohio Statewide Mathematics Outreach Project

In 2019, members from The Ohio State University's Buckeye Aha! Math Moments (BAMM) spoke at the Ohio Mathematics Initiative (OMI) Chairs/Leads Network meeting to outline their mission to create a deeper appreciation of mathematics for high school females and underserved minority groups through the form of a math summer camp. OMI representatives were encouraged to increase public awareness of the program and nominate faculty within their institution to participate in the Ohio Statewide Mathematics Outreach Project.

Due to the impacts of COVID-19 this work has been delayed; however, it is still ongoing and scheduled to be reestablished. This important initiative tying diversity, equity, and inclusion to the world of mathematics is open to all institutions across the state. Should your institution be interested in participating, we encourage your mathematics department and faculty to contact outreach@math.osu.edu. Future updates surrounding this project will be shared with the OMI Chairs/Leads Network.
Collaboration around Essential Components

Subgroup 1 – New and Alternative Pathways

Subgroup 1 is interested in exploring options around a Calculus I course over two semesters integrating pre-calculus content in a just-in-time format. It is also exploring various co-requisite options for the existing pathways and potential future pathways. In the upcoming year, the subgroup hopes to explore options for sub-pathways within STEM-Prep to include applied and non-applied options. It also wishes to gather additional information and provide professional development that would allow institutions to learn more about the integrated pre-calculus/calculus model.

Subgroup 2 – Revision of the Ohio Transfer 36 Criteria

Subgroup 2 is charged with redesigning Ohio Transfer 36 course criteria and processes to focus on student learning outcomes, increasing departmental flexibility in determining pre-requisite courses and credit hour requirements for Ohio Transfer 36 courses, and defining what distinguishes a course as “college level.”

With this charge, the subgroup has been supportive in the following projects:

• **Life Science Calculus I & II** - On February 8, 2021, an announcement was sent statewide to each Ohio public institution of higher education that the following TMM courses have been endorsed statewide as Ohio Transfer 36 courses: TMM024 - Life Science Calculus I and TMM025 - Life Science Calculus II.

• **Discrete Mathematics** - On March 12, 2021, an announcement was sent to institutions that the following TMM course was officially approved as a new Ohio Transfer 36 course: TMM023- Discrete Mathematics.

• **Introductory Data Science** - The group has created draft learning outcomes with a final draft review by the entire subgroup. Learning outcomes will be sent out for statewide endorsement early fall 2021.

• **Precalculus** - The group has created draft learning outcomes and supporting illustrations as a proposed revision to the current TMM002 - Precalculus course. Learning outcomes are currently under review by the entire subgroup with anticipated endorsement by fall 2021.

Looking ahead:

With a shift from Ohio Transfer 36 guidelines to learning outcomes, the Mathematics, Statistics, and Logic guidelines have been discontinued. Subgroup 2 will work to determine if additional course development will assist with transfer across the state. An area of group interest is the development of a logic course utilizing learning outcomes. The subgroup has intentions to review current courses to determine if additional revisions are required in the upcoming years.
Subgroup 3 – Communication, Outreach, and Engagement

Subgroup 3 focused its efforts on reaching out to the mathematics community through various webinars. On July 21, 2020, Subgroup 3 joined the Ohio Articulation and Transfer Network for a presentation during one of the Transfer Talk Tuesday events. The event focused on the history and structure of the OMI, the work that has been accomplished, and how the OMI is involved in transfer initiatives. A video recording of the event is available on YouTube.

Subgroup 3 sponsored a webinar on October 27, 2020 on Quantitative Reasoning in a Virtual Environment. This was a joint effort with the faculty members from Subgroup 2 who review Quantitative Reasoning courses for the Ohio Transfer 36. Projects and discussion materials were sent to participants in advance. Discussion topics were arranged as breakout sessions, and include the flipped classroom, active learning, software, and assessment. The webinar recording is available on YouTube.

On August 6, 2020, Subgroup 3 sponsored a webinar where mathematics faculty could gather to have an open discussion about the challenges experienced teaching courses via the pandemic-related remote delivery format, and exchange ideas for effective course delivery. The Ohio Mathematics Initiative: Online Formats in Mathematics Discussion provided an opportunity for faculty teaching mathematics courses from around the state to ask questions and share best practices. A recording of the discussion is located here.

For the upcoming year, Subgroup 3 has plans to continue sponsoring additional webinars of interest to the mathematics community.

Subgroup 4 – Data Collection, Analysis, and Sharing

Subgroup 4 has been temporarily disbanded pending availability of comprehensive data for future research. In the meantime, smaller research projects will be handled by the most closely aligned subgroup.

Subgroup 5 – Alignment between Secondary and Postsecondary Content and Instruction

Subgroup 5 focused on reinventing itself during the past year. The subgroup added new members from the high schools to its roster. It had its first meeting in October 2020 with all of the new members present. During that meeting, the members had an opportunity to share with one another information about all the changes taking place in both secondary and postsecondary mathematics. The subgroup’s focus moving into the future is going to be on increased communication and sharing of ideas between secondary instructors and postsecondary faculty.