Ohio Mathematics Initiative
Rethinking mathematics courses, curricula and their relationships with other disciplines

The Ohio Articulation and Transfer Network (OATN)
Ohio Mathematics Initiative (OMI)
Faculty Co-Leads Meeting
25 S. Front St., Columbus, OH 43215
Basement Level Conference Room B-004
Tuesday, June 18, 2019
10:00am to 2:00pm

Present: Jennifer Walls, Aaron Altose, Serita McGunia, Andrew Tonge, Tyler Maley, Brad Findell, Karl Hess, Steve Miller, Ricardo Moena, Donald White, Luis Casian.

ODHE/OATN and ODE Staff: Brian Roget, Anna Cannelongo, Stephanie Davidson, Brett Visger, Brenda Haas, Stephanie McCann, Paula Compton, Candice Grant, Jared Shank, Jessi Spencer, Michelle Blaney, Ellen Peterson, Nicole Chain.

I. **Welcome & Introductions**

The meeting convened at 10:00am with re-introductions from the subgroup co-leads and Ohio Department of Education (ODE) and Ohio Department of Higher Education (ODHE). Dr. Luis Casian, Dean of Natural and Mathematical Sciences at The Ohio State University, reviewed the overall goals of the Ohio Mathematics Initiative (OMI). In addition, Dr. Casian discussed the results of the previous Chairs/Leads Network Meeting and set some targets for the current meeting.

II. Key Initiatives Impacting the Future

Anna Cannelongo, Education Program Specialist in Mathematics for ODE, opened her presentation by reviewing the strong link between K-12 and higher education. She emphasized that ODE has a new collaborative strategic plan that focuses on the whole child – rather than just childhood or young adulthood. She stated that the strategic goal for ODE and ODHE is to increase the percentage of students engaged in post-graduate pursuits. The three core principles of the plan ODE strategy are equity, partnerships, and quality schools.

Ms. Cannelongo stated that Ohio currently has about 45% of students engaging in post-secondary degrees or certificates of value to the workforce, which places the state in the bottom third nationally. ODHE has set an attainment goal of 65% engagement in post-graduate education by 2025. She presented a variety of strategies that Ohio is implementing to reach this goal, including supporting multiple ways of evaluating student knowledge and success, providing support to faculty, and increasing professional learning activities for educators. The group, as well as Ms. Cannelongo, also supported the idea of a math gateway course which filters students into relevant math courses for their future goals.

Ms. Cannelongo discussed ODE's partnership with The Dana Center to promote their goals of a more integrated mathematical experience for the transition from high school to college. The Conference Board of Mathematical Sciences (CBMS), is an umbrella organization consisting of eighteen professional societies whose goals include those similar to the ODE/ODHE vision. Namely, diffusion of knowledge in the mathematical sciences and improvement of mathematical education. CBMS is working in collaboration with The Dana Center at the University of Texas to promote Mathematics Pathways and held a forum in May to discuss bridging the gap between college and high school math courses. The Dana Center is working with the state of Ohio to implement their principles of quick structural change and continuous improvement to develop pathways that will allow students to take mathematics courses relevant to their interests and future goals. The Dana Center has offered a learning course and guided materials on implementing Quantitative Reasoning (QR) courses to achieve the goal of becoming remediation-free.

Currently, Algebra II or an equivalent course, taken in high school, is not meeting the needs of all students but is the only course required by law for graduation. The tension surrounding this course within the mathematics and higher education communities involves the overwhelming need for more STEM students yet the irrelevancy of the course to career tasks for those outside the field. In addition, the law concerning Algebra II does not include set student learning outcomes. Rather, districts are leftto determine what should be taught. As a part of the Launch Years, pathways will be developed that assist students without STEM career goals in filtering into pathways that better fulfill their intentions such as Statistics or QR. It will be important to keep the pathways flexible in case students change their goals, yet it should also be ensured that a strict rigor is in place so that students are not divided by their strengths in Algebra II.

For the OMI, this will mean further involvement of K-12 faculty and administrators – these will likely be integrated into Subgroup 5. The timeline begins in October 2019 with a goal to have committees created and meetings initiated. Throughout 2020 the initiative intends to review math courses and consider gateway courses, with intentions to release recommendations by the end of the year. The group then discussed the potential of using a technical math course as an Algebra II equivalency course; however, this course presented concerns of maintaining college-level standards. Dr. Ricardo Moena is reviewing the feasibility of technical math alignment, as well as Dr. Candice Grant through her development of mathematics pathways in the Ohio Guaranteed Transfer Pathways (OGTP).

Mr. Brett Visger gave an overview of Strong Start to Finish (SSTF), which is an initiative with a goal to increase the number of students completing gateway mathematics and English courses within their first academic year of higher education. Currently 33% of first-time students at

participating colleges and universities complete college-level mathematics and English in their first year. This rate is lower for minorities and adults under 25 years of age, and Ohio SSTF is committed to reducing these equity gaps. Mr. Visger asked for the co-chairs' help in determining the gateway math courses from their institutions, as currently only 27 institutions have provided this information and several others have incompletely submitted the data. Once ODHE has the data on these courses, they can do more analyses on co-requisites and equity gaps. Mr. Visger also stated that their initiative is working to perfect the placement process for students, as testing and other "best" practices may not work for evaluation of every student.

III. Lunch

IV. Faculty Group FY19 Accomplishments and Future Direction

After lunch, each subgroup shared an update on their respective goals and accomplishments. Subgroup five began by discussing the possible restructuring and recruitment campaign that they will need to undergo. Serita McGunia stated that the group already has a roster of interested high school teachers to whom they could reach out to broaden the voices of the K-12 educators. They hope to select a liaison for the K-12 teachers and assign that individual to be the 4th co-lead who would have an equivalent role to the other three. Co-leads stated that they will intend to include in their annual report what they have done to redesign their structure and how the new structural changes have impacted their scope of work.

Dr. Karl Hess stated that Subgroup 1 has researched and documented the co-requisite structure of mathematics courses and will share this information with multiple groups. Within the next year, the group intends to organize 4-5 regional small-sized conferences with hopes to increase statewide participation in the initiative. A survey concerning co-requisite implementation was conducted approximately one year prior to evaluate the strengths and weaknesses of these courses. The group will re-distribute this survey in the coming year and summarize their results at an upcoming co-chairs meeting. So far the group has determined that multiple co-requisite models are being implemented across the state and they are in the process of determining how to use each model most efficiently.

Subgroup 2 is one of the larger groups with about 24 faculty on board, and their progress was summarized by Dr. Ricardo Moena. Due to the size there are several projects currently ongoing. The group has developed an Ohio Transfer Module course for technical math which will be distributed for endorsement soon. The group also has a life science calculus option in development for an additional OTM course. In the upcoming year, the group intends to examine potential gateway courses for the STEM pathway. This will involve an option for high school faculty to work with Subgroup 2 to design College Algebra so that Algebra II is a better preparatory course for this transition. The committee asked about the resequencing of Calculus;

however, Subgroup 2 stated that this is not a priority as different institutions are currently experimenting with different sequences to evaluate the best method. The subgroup also announced that they are considering researching a year-long calculus course which would hopefully slow the dropout rate and eliminate the filter-feature of the course.

Subgroup 3, whose focus is outreach and engagement, presented recently about OMI at the Ohio Mathematics Association of Two-Year Colleges (MATYC). In addition, the group sponsored their first webinar on Open Educational Resources (OER) in collaboration with the Ohio Open Education Collaborative. The group intends to participate in more regular webinars, and intends to attempt to structure these webinars at times that are more predictable for faculty. The group is currently working to put together a 'Fast Facts' document that will address the OMI work on co-requisite models of mathematics. Some considerations that the group is exploring in the upcoming year include how to communicate more effectively with faculty, who to target with the goals and activities of the OMI, and involving the participation of students and employers in the initiative.

Subgroup 4, presented by Dr. Donald White, focuses on data collection relevant to the Ohio Mathematics Initiative and composed of Ohio's 36 public institutions. The data being collected describes the post-graduate activities of students across the state of Ohio, with an eight year-follow up period – this span will be shortened to six years for simplicity purposes. Subgroup 4 is also examining the relationship between graduation rates and mathematics courses taken in secondary and post-secondary education, and will be distributing another survey on this matter in the near future to get more recent results. These two data sources should assist the other subgroups in structuring their initiatives, communications, and research. Finally, Dr. White asked the committee for an additional co-chair to help him with needed duties.

V. Changes Needed to Implement Future OMI Initiatives and Goals & Updating Faculty Groups

Dr. Compton provided a brief summary of the goals and accomplishments from each group, and asked them to set their top priorities for the upcoming year. First, the group will need to work with ODE and the K-12 initiatives to begin the Algebra II discussion. Subgroup 1 set their top priority to announce and hold the 4-5 regional conferences to encourage statewide participation in the initiative. Subgroup 2 is prioritizing development of learning outcomes for the new courses they discussed during their presentation. They also intend to conduct a conference in the spring which will go over best practices for the year-long calculus course being tested. Subgroup 3 will be working with Subgroup 5 to find and inform high school faculty and admissions counselors of OMI initiatives and programs. Finally, Subgroup 4 will be working on finding an additional co-chair and conduct active learning seminars with statewide faculty.

Returning to some of the initial goals for the meeting proposed by Dr. Casian, Dr. Compton asked co-chairs for ideas on how to involve more women in math and STEM fields. Some suggestions included going to middle and high schools across Ohio and presenting math as a fun subject by relating it to topics students find interesting. One member proposed implementation of STEM summer camps, similar to one offered by The Ohio State University, in which the camp is run by and aimed at adolescent girls. Dr. Compton proposed including higher education collaborators, such as those involved in Strong Start to Finish, to develop a more streamlined pipeline for students with an interest in math to become STEM majors.

Dr. Compton then asked the high-school teachers present if they had any comments or thoughts on what was discussed in the meeting. Jennifer Walls commented that she appreciated the collaboration between higher and secondary education, and emphasized the need for involvement of counselors to be a liaison between students/families and educators. Aaron Altose, Assistant Professor of Mathematics at Cuyahoga Community College, stated that he felt the co-leads group had philosophical differences in their goals and views of QR courses and material. In higher education, students have a specific goal for their education and QR allows them to get closer to achieving this set objective; however, in secondary education it helps to filter students into pathways for careers and prepare them to be college-ready. He suggested that a discussion should be initiated in which they decide when it is appropriate to provide students with all options versus narrow the students into a specific pathway. Steve Miller, Summit Educational Service Center Mathematics Consultant, stressed the need for involvement of not only counselors, but high school teachers – as they will need to structure their information and courses to the various pathways.

Dr. Candice Grant, Director of the Ohio Guaranteed Transfer Pathways, said that she is also interested in communicating more with secondary counselors. She mentioned that the pathways currently under review will be finalized by the fall and they can use the results from implementation to discuss common mathematics concerns within the pathways. Jared Shank, Director of Military Apprenticeship Initiatives, expressed a strong interest in the conversation concerning technical mathematics courses as they are relevant to students on the military track.

VI. Next Steps

Dr. Compton asked the co-chair group if another subgroup should be formed focusing on diversity and equity. This group would help to address some of the issues with a lack of women in STEM majors in Ohio, open source textbooks, and inclusion of minorities in the field. One individual suggested that a collaboration with Strong Start to Finish could help to accomplish some of these ideals. Finally, Dr. Compton raised a suggestion to work with the Ohio English

Initiative (OEI); however, this goal will take more time to work out as OEI does not have a common problem that OMI could provide input on.

Dr. Compton asked the group for any final comments, and concluded the meeting by thanking the participants for their assistance and service.