



**The Ohio Articulation and Transfer Network (OATN)
Ohio Mathematics Initiative (OMI) Chairs/Leads Network Meeting**

Friday, May 7, 2021

WebEx Virtual Meeting

10:00 am to 1:00 p.m.

Present: Lee Wayand, Brad Findell, Luis Casian, Anna Cannelongo, Ricardo Moena, Karl Hess, Cosmin Roman, Jim Fowler, Andrew Tonge, Monica Delgado, Greg Goodhart, Robert Raupach, Carl Stitz, Blerta Ereditario, Tyler Maley, Sara Rollo, Martin Mohlenkamp, Phil Blau, Aaron McClure, David Redett, Jean Lafont, Kevin Kreider, Ayse Sahin, Tom Wakefield, Alice Taylor, Arun Rahunanthan, Christina Hamman, Ivan Sopruncov, Kelly Stady, Larisa Russell, Marianna Doolittle, Patrick Dowling, Sandy Siegrist, and Xiang Yan

ODHE/OATN Staff: Thomas Sudkamp, Paula Compton, Zoe Woodbury, Candice Grant, Jessi Spencer, Jared Shank, Michelle Blaney, and Mitch Wilson

I. Welcome and Introductions

Dr. Luis Casian, Dean of Natural and Mathematical Sciences at The Ohio State University (OSU), welcomed the Chairs/Leads Network to the spring statewide meeting.

II. Co-Requisite Calculus Courses

Mr. Karl Hess, Chair of Mathematics at Sinclair Community College and Dr. Cosmin Roman, Associate Professor of Mathematics at The Ohio State University, provided insights that over the last several years, Subgroup 1 has focused on learning about the different models for co-requisite remediation that have been used by different institutions around the state of Ohio, and then sharing information on those models in the form of workshops.

Mr. Hess went on to describe that Subgroup 1 has been focusing their energies on the three pathways Ohio has already identified: The STEM-prep pathway (where the gateway course would be College Algebra), the Introductory Statistics pathway, and the Quantitative Reasoning pathway. They identified the STEM-prep pathway as an area that needed more in-depth consideration. The STEM pathway could rather easily be divided into two sub-pathways based upon two types of STEM degrees, those that are applied and those that are not applied. The applied programs often start with College Algebra as the first credit-bearing course. The non-applied degrees usually have Calculus I or some form of Calculus I like Calculus for Life Science as the beginning of the degree requirements. For the non-applied degrees, starting in College Algebra is like

starting in a remedial course. Mr. Hess went on to state that these degrees are heavily sequenced, so starting out behind in mathematics has a large impact on student success. One way that remediation has been addressed is the accelerated Pre-Calculus course which reduces remediation to a semester. The Pre-Calculus course can be challenging because it is two courses combined into one course.

Mr. Hess and Dr. Roman spoke to the Network about discussions around the creation of integrated course sequences. In this situation, a series of integrated sequences of courses would cover what is in Calculus 1 over two semesters but also integrate what would have been covered in Pre-Calculus. This integration is currently being done at The Ohio State University, Kent State University, as well as the University of Cincinnati. Mr. Hess and Dr. Roman discussed the possibility of a workshop in the near future to provide more information on course integration statewide. Those in attendance suggested interest in attending a workshop on this topic.

III. Update on ODE/ODHE High School Mathematics Initiatives

Ms. Anna Cannelongo, Education Program Specialist- Education at the Ohio Department of Education (ODE) provided an update on the Strengthening Ohio's High School Math Pathways Initiative,. Ms. Cannelongo began by noting that the advisory council has written a statement letter in support of the initiative, a final version of this will be available soon. She went on to mention that the Mathematics Modeling and Reasoning (MMR) Pilot Program has grown significantly in the last year, totaling approximately 90-100 participating schools in 45 Ohio counties. Data collection will also resume this year, after losing data collection capability last year due to COVID-19. It was also noted that around thirteen higher education institutions collaborated with the MMR Pilot Program in the 2020-2021 academic year, but the program needs additional higher education collaborations across the state in 2021-2022. Next was an update on the Data Science Pilot. Ms. Cannelongo mentioned that there are currently about 20 schools interested in Data Science. Most of the interest to date has been in central and southwest Ohio. In fall of 2021, the initiative will be announced on the ODE website with Quantitative Reasoning (QR) and Data Science Foundations being piloted. In fall 2022, the proposed timeline will continue with schools implementing pathways and Algebra 2 equivalency courses. Computer Science/Discrete Math will be piloted, and QR and Data Science Foundations will be expanded in phases across the state. Ms. Cannelongo went on to mention that with the QR MMR course moving to the third year as an Algebra 2 equivalent course, that opens the possibility for students to take a QR course in their senior year through College Credit Plus (CCP). A few preliminary figures were provided

regarding the number of potential students who may be interested in taking a CCP course through a partner school. Examples included 200-500 students for Cincinnati State, 45-205 students for Clark State, 300-450 students for Columbus State, 58-198 students at Cuyahoga Community College, and 290-760 students for Sinclair Community College. These were preliminary numbers while data was still be gathered. These students might be interested in a CCP course for the 2023 school year. Institutions should consider whether they offer enough sections of the QR course and have enough teachers trained to meet this possibly growing need. Ms. Cannelongo concluded that next fall, a Toolkits page with resources will be launched on the ODE website. There will be sections of resources that are general resources, or for administration, counselors, teachers, and maybe eventually a higher education section. Overall, during the presentation there were three needs presented to the Chairs/Leads Network: the need for more CCP QR teachers, more higher education collaborators, and a plan to sustain higher education and high school partnerships after the pilot program ends.

IV. Mathematics Course Development Update

Dr. Ricardo Moena, Assistant Department Head and Professor of Mathematical Sciences at the University of Cincinnati and Dr. Lee Wayand, Associate Professor of Mathematics at Columbus State Community College provided an update on mathematics course development. The group has received statewide endorsements for Technical Mathematics I & II, Elementary Mathematics Education I & II, Life Science Calculus I & II, and Discrete Mathematics. A Data Science endorsement is still pending. The group is awaiting final edits from a late April meeting before reviewing the material in summer 2021 with statewide endorsement anticipated fall 2021. Pre-Calculus materials have been sent to the Ohio Transfer 36 Mathematics, Statistics, and Logic faculty panel, which is also Subgroup 2 of the OMI for review, with anticipated statewide endorsement fall 2021. It was also mentioned that in the future there will no longer be guidelines in the Ohio Transfer 36. All courses will need to have learning outcomes; thus Subgroup 2 will begin to work on a set of learning outcomes for logic courses. As an addition to the earlier QR discussion, Dr. Moena mentioned that there are 26 institutions right now with courses approved for QR. Dr. Wayand went on to provide an update on Pre-Calculus. There are aspects of mathematical thinking that need to be taught to put reasoning back into the STEM pathway. Currently in the Ohio Transfer 36, College Algebra plus Trigonometry is equal to Pre-Calculus. This is not currently working, with institutions already starting to move away from that arrangement. On behalf of Subgroup 2, Dr. Wayand acknowledged that it is time to take a different approach and begin looking at courses that provide reasoning with functions as a preparation for

Calculus. There is a need to consider the student coming out of the course rather than just the content in the course. Students need communication, reasoning, logic, conditions and conclusions, justifications, investigation, conjectures, counterexamples, revision, perseverance, and critical thinking. Institutions need to stop thinking of these as qualities that will allow students to move on, and rather deliberately and explicitly put these items into class to teach students how to think this way. Pre-Calculus needs to be thought of as the beginning of Calculus. It is the beginning of a discussion that's going to continue through Calculus, and it needs to be deliberately designed. Dr. Wayand went on to conclude that this represents the building of a new idea on an old foundation of College Algebra which does not support this approach. Thus, College Algebra needs to be removed from the STEM pathway and replaced with a new approach to Pre-Calculus preparation. Removing College Algebra would involve many changes, but it is time to rethink why students are taking Calculus and how to prepare them to understand new ideas. There is still a place for College Algebra, but it needs more reasoning, programs that want this type of education that do not lead to Calculus need to be identified.

V. **Mathematics Outreach Programs Updates**

Ms. Monica Delgado, Associate Director of Outreach at The Ohio State University and Dr. Claire Merriman, Ross Assistant Professor at the Ohio State University, representatives from the leadership committee of the Ohio Statewide Math Outreach Project provided an update on math outreach programs. The group has formed a three-person leadership committee to better target outreach efforts. The main objective of this group is to obtain data about mathematics diversity in Ohio higher education. Ms. Delgado noted that this is an ambitious task, and that the group needs to figure out what Ohio public institutions of higher education require in terms of outreach. An overview of outreach events that have been occurring through the Buckeye Aha! Math Moments (BAMM) initiative at the Ohio State University was provided to attendees. These include digital monthly classroom workshops, a science and sustainability festival, seminars, an essay contest, a diversity in math movie series, and a beyond the classroom summer mathematics camp. Due to COVID-19 there has been a delay in progress however, the initiative is scheduled to continue progress and expansion of attendees. Ms. Delgado concluded that if institutions are interested in participating or replicating the initiative at their institution, please reach out for additional information.

VI. Discussion

Dr. Casian opened the last part of the meeting for a four-part discussion. First, attendees discussed COVID-19 and online teaching. Attendees went on to discuss textbook development. There were no major announcements or updates provided during the discussion. Attendees also discussed the Ohio Transfer 36 course review process. There are many currently approved Ohio Transfer 36 mathematics courses that will have to be re-reviewed. In general, there are 3,200+ courses that must be re-reviewed across all five areas of the Ohio Transfer 36. The re-review process will be conducted in order of year of prior approval. Attendees concluded with discussions around observed score differences between proctored and unproctored placement tests over the last year.

VII. For the Good of the Order

Dr. Casian concluded the meeting by thanking attendees for participating. This was followed by meeting adjournment.