



Ohio Higher Education Mathematics Steering Committee – Meeting Minutes

September 13, 2013 10:00-3:00

Ohio Board of Regents B-004

This was the second meeting of the Ohio Mathematics Steering Committee. Present in the room were:

- Committee members: Linda Chamblin, Paddy Dowling, Joan Leitzel, Krista Maxson, Jeff McNeal, David Meel, Ricardo Moena, Rodney Null, Carl Stitz, Andrew Tonge, Uri Treisman, Michelle Younker, and Jeff Zeager.
- Ex-officio members: Bruce Johnson, Brian Roget, Randy Smith, Mike Snider
- Ohio Board of Regents staff: Carlos Bing, Michelle Blaney, Paula Compton, Stephanie Davidson, Stephanie McCann, Brett Visger
- Dana Center Staff: Uri Treisman

I. Welcome and Introductions

Dr. Stephanie Davidson opened the meeting by welcoming everyone and thanking them for attending. Dr. Joan Leitzel then introduced Dr. Uri Treisman to the committee and provided biographical information. She expressed that we are very fortunate to have him here, as he is a very recognized professional and rightly so. Ms. Jenna Cullinane was unable to attend the meeting in person, due to a flight cancellation. She is the policy and strategy person from the Dana Center. She is working on her Ph.D. at the University of Texas Austin. Dr. Leitzel introduced Ms. Cullinane and provided biographical information. Ms. Cullinane joined the meeting via telephone.

Dr. Leitzel asked the meeting attendees to go around the room for introductions, and to mention each person's single best hope for the outcomes of the Mathematics Steering Committee.

The following are a few points from the round robin discussion:

- Student Completion
- Framework for students to be successful and learn mathematics skills needed for life
- There are shortcomings in the process for OTM and a need for change.
- A distinction needs to be made between college level and secondary.
- Learn more about OBR and this process
- With multiple pathways, where will students begin and how will they move along the pathway?
- Clear steps and directions
- Better clarity and clear expectations for students

- The exit of the Common Core needs to align with the beginning of college level; then alternative pathways. Even if alternative pathways mean no mathematics, so be it. We need to look at bold strategies
- What does it mean to be leaving prepared for work and college? What is college level?
- Something broader should be developed for non-traditional students.
- What do students need for their careers? Also, consistency is needed across Ohio.
- We need to look at the data and let it guide our efforts.
- Successfully fulfill the charge of the committee

II. Approval of June 26, 2013 Meeting Minutes

Dr. Leitzel asked the steering committee members about the meeting minutes from the June 26, 2013 inaugural meeting. She also acknowledged the good work of Ms. Michelle Blaney in preparing the document. The steering committee members approved the minutes as written.

III. National Perspective

Dr. Treisman and Dr. Leitzel provided the steering committee with information about what is occurring nationally. The following are a number of points from this discussion:

- Dr. Treisman mentioned in Texas about one-third of students who continue directly on to higher education have taken calculus in high school. About fifty percent of these students start in a class that has already been taken in the past.
- There has been a significant amount of reform in biology and engineering. This has opened the window for reform in mathematics. We are behind biology, engineering, and chemistry in curriculum reform.
- Completion measures are tied to the recession. Sixteen states have developed funding formulas that are tied to outcomes and nine more are likely to do so in the next year or so. Courses with the highest failure rates are being examined closely and of course, math courses are on this list.
- Dr. Treisman assigns his freshman calculus students [The Mathematical Sciences in 2025](#), and asks them to identify truly amazing recent contributions of mathematics to society.
- Legislatures are increasingly active in areas once thought to be the province of faculty members including curriculum reform
- Dr. Treisman mentioned that Ohio has more innovation per square inch than any other state he has ever been in. Ohio has good people with an enormous amount of energy devoted to improvement.
- The [Uniform Statewide Standards for Remediation Free](#) are poorly aligned with the Common Core Standards.
- How do we create a more coherent system of mathematics education with more consistency and quality?
- Quality must not become a victim of the completion agenda.
- How do we ensure credits will transfer from one institution to another?
- Ohio's solution will not look like other states. Ohio needs its own solution. We will share with other states and also learn from them.

- Book: [Fueling Innovation and Discovery](#). Dr. Treisman will include this book in the suggested reading for the steering committee.
- We need to make a much better case for mathematics as a discipline and as a means toward upward mobility. This should be an implicit goal of the committee.
- Philip Griffith, Mark Green, Tara Holm, Eric Friedlander, and Uri Treisman have been funded by the Carnegie and Sloan Foundations to catalyze productive discussions about undergraduate mathematics education.
- The amount of mathematics being taught outside of mathematics departments is increasing.
- Viable models are needed for supporting our mathematics departments' improvement activities.
- Georgia, Texas and Ohio are having this discussion with faculty involved. In some other states this discussion is so political that faculty are not involved. Faculty need to be part of the discussion to ensure the integrity of the discipline.
- The high school curriculum is changing. There is near uniform affection for the Common Core Mathematics Practice Standards, less for the content standards.
- Parents will also need to understand what college readiness means so they can help. How will we communicate this message to parents?
- Veterans' transcripts look like a littered landscape of lost credits.
- In 2009, 35,000 California community college students repeated a developmental education course five or more times.
- Mathematics education needs to be connected broadly to a student's future plans. Dr. Treisman mentioned a situation where 40 firemen were prevented from moving forward in one program due to difficulties with a mathematics course.
- A consequence of change at the secondary level is the need to change the preparation of secondary teachers.
- The CBMS booklet "[The Mathematical Education of Teachers II](#)," distributed at the meeting, is an excellent guide for those designing mathematics courses for teachers.
- Mathematics is a dynamic field and changing in many ways
- There is a national conference next spring on entry level mathematics courses.
- Re-sequencing the topics in calculus has been a big topic of discussion to get students to multivariate calculus sooner.
- How will we educate the public about these mathematics conversations?
- The Association of Public and Land-grant Universities (APLU) has a mathematics partnership called the [Science & Mathematics Teacher Imperative](#) with schools on teacher education.

IV. Committee Charge and Big Topics Discussion

Dr. Leitzel began by discussing the content of the draft steering committee charge, and asking if anyone wanted to change anything. There were no changes suggested for the draft charge.

Ms. Cullinane and Dr. Treisman gave a presentation and led a discussion on research and major topics to be considered.

- The steering committee will be working with Dr. Stephanie McCann and her staff as a resource in gathering data to support their recommendations. The data will be very important.
- The level of rigor must be high.
- “Reformers believe the future will always be better. Administrators know it can always be worse.”
- The Dana Center has been working deeply with mathematics reform.
- What are the gateway courses?
- What types of preparation will we be expecting for students?
- This is an exciting opportunity to advise the state.
- How do we modify our courses for various pathways while using recommendations from various professional organizations?
- Many students who attend college end up with debt rather than a useful certificate or degree.
- Dr. Treisman pointed out that [Complete College Ohio](#) is a good report that everyone should read.
- 78% of graduates from the University of Texas Austin (an institution similar to OSU) have credits from a community college.
- Reverse Transfer: Dr. Treisman was 6 credits short of an AA. He received it 30 years later.
- Dr. Carl Stitz mentioned that many students come to community colleges for training, licenses, or certificates, but not for a degree.
- What is the right mathematics course? Fewer than 5% of those students who take College Algebra ever take Calculus I.
- Academic advisors tend to be risk adverse. Their perspectives can be quite different.
- Are there better pathways to deliver modern mathematics while maintaining the integrity of the discipline?
- How do we create pathway courses with integrity? We don’t want courses like “Our Friends the Numbers.”
- Can we reinvigorate the minor? There are approximately 1,000 undergraduates majoring in mathematics at OSU. Approximately one-third of them are in actuarial science.
- We need to work on developing pathways that are rock solid, lead somewhere, and have success rates.
- This group needs to speak with one voice and frame the discussion with others.
- Parts of the report may include Background in Ohio, the Case for Change, and Permission Giving.
 - We will be experiencing “cycles of mutual permission giving” as this work is implemented.

Prior to the working lunch, the committee members divided into their breakout groups to address questions posed to them by Dr. Leitzel. The members were asked to identify three essential components to the committee’s work, one essential challenge to accomplishing the committee’s goals, and be prepared to explain why for each.

Group One Report Out

1. What is college level in reference to the common core?
 - a. We need a better understanding of common core and remediation free
 - b. Topics vs. depth. How are things treated?
 - c. The entry level in college needs to reflect the new common core
2. New entry points outside of the OTM are needed
 - a. What else can we use?
 - b. How do we address the delivery of courses?
 - c. How do we meet the requirements of the course?
3. Which mathematics courses are requisite for other disciplines?
 - a. How do we change delivery for these?
 - b. OTM courses should meet requirements for the major, not just the degree.

Additional Discussion

- What is the role of the mathematics department to work with other departments on alignment?
- Need to consider new course creation and prerequisites in light of the common core.
- Many departments during times of rapid enrollment turned to mathematics as the “bad cop,” and created artificial prerequisites.
- New course creation may create transferability issues
 - May wish to consider Tuning process.
- Need ways to determine college ready that are actually connected to success in the next course

Group Two Report Out

1. What does a 22 on the ACT really mean?
 - a. This is not clear statewide.
 - b. There is a message issue concerning the 1st credit bearing course.
 - c. The group should look at the Remediation Free Standards to provide better clarity.
 - d. There is a crisis emerging that should be addressed before December 15, 2013.
2. Ohio Transfer Module
 - a. How do we fix the course descriptions?
 - b. How do we permit flexibility without hurting transferability?
 - c. How do we measure outcomes?
 - d. There is no assessment of outcomes.
 - e. OTM process will need to be revised.
 - f. How do we optimize in a policy environment?

Additional Discussion

- Add information about funding formula, reverse transfer and ACT course by state law to the agenda for October.

Group Three Report Out

1. How do we facilitate transfer by fixing what we have now?
 - a. A subgroup of 3 or 4 main ideas for college algebra would be more inclusive for more courses.
2. We are currently very strict about the prerequisite, but the institution is really the one who should decide.
 - a. The institution should be accountable for the outcomes.
3. We need to encourage the creation of alternative courses?
 - a. Quality things can be done differently and still transfer.

Additional Discussion

- There is a need for greater flexibility. One solution would be to move away from considering every item and consider central ideas and evidence.
- What about measuring outcomes through the exams given to students? Standard exams are a dangerous thing. There is an enormous spread in scores across a single department.
- Do we have a responsibility to prepare our faculty for the type of teaching and courses we are about to propose?
- Has there been any movement to research pedagogy in mathematics at the graduate school level? Add this to the steering committee suggested reading list.
- We are now in the process of brainstorming. If anyone gets another idea on the way home, email it to the group.

V. New Secondary School Common Core Standards in Mathematics

Mr. Brian Roget presented a PowerPoint presentation titled “The New Learning Standards for Mathematics.” The following are a few major points from his presentation and discussion afterward:

- The new expectations were developed in 2009.
- Fall-Winter 2009-2010 the Common Core was developed.
- There was much faculty participation in the 2010 release review.
- In June 2010 the Common Core was completed and adopted.
- There are 3 things impacting implementation:
 - Standards
 - Assessments
 - Graduation Requirements
- Schools are running behind on implementation.
- The format is divided into two main parts:
 - Conceptual Categories rather than courses
 - Mathematical Practices. Mr. Roget provided a handout that contained the 8 key practices in a box on the 3rd page.
- There are many resources nationally to help teachers with implementation.

- Information for how schools should create courses is available in the appendix. There are two pathways: Traditional and Integrated.
 - It is a district decision which pathway to choose.
 - There are a fair number of districts moving toward the integrated approach. It was a teacher driven decision.
- Schools are supposed to compare the old and new curriculum to find the differences and take ownership of the standards at the high school level.
- End of course assessments
 - There is a two-part summative assessment
 - Performance-based assessment – A hand graded assessment that involves thinking, reasoning, and providing rationales or reasoning for doing something.
 - End of year/course exam
- Some students will finish the Common Core in 10th or 11th grade. In the first couple years of the implementation of Common Core, average assessment scores for all grades are expected to be significantly lower than what we've seen in recent years on Ohio's statewide assessments.
- Who is going to show teachers what will work? The Ohio Department of Education (ODE) is hoping to find best examples to demonstrate to teachers.

Additional Discussion:

- We need to consider what we want the 4th year high school courses to be for students who finish the Common Core early.
 - The University of Akron started working with the lower grades in their area 3 years ago.
 - Indiana and Colorado are looking to the 2-year sector to create bridge courses.
- Mr. Rodney Null has an initial cohort of students going through a new program. Also, teachers are going through extensive professional development.
- For students who are ready, why are they not taking dual enrollment?
 - Place dual enrollment on the list of things to examine.
 - There are strict criteria coming in the future.
 - Place dual enrollment on the agenda for a future meeting.
 - In Colorado, 100% of the legislators voted for a dual/concurrent enrollment bill.
 - Should there be a cut score for PSEO and dual enrollment?
- Some states have made a commitment that no student should run out of mathematics courses.
 - As an example, what should be done for students who score a 5 on the Advanced Placement Calculus BC exam in junior year?
 - Perry County is doing a pilot of multivariate calculus with Dr. Stitz and Lakeland Community College.
 - What about the 4th year courses for students who are struggling?
 - The Mathematics Steering Committee has the potential to influence what is taught in the high school for 4th year mathematics.
- An agenda item is needed to discuss how to communicate the excellent things that are happening.

VI. Discussion

There were three discussion questions provided on the meeting agenda:

1. Are there features in the current processes (including transfer processes) that are positive and probably should be retained?
 2. Are there innovations/experiments/new efforts underway or envisioned in programs at Ohio institutions about which all should be aware?
 3. What has been learned from these processes and innovations/experiments/new efforts?
- Mr. Null and Dr. Stitz mentioned examples of college preparation programs.
 - Dr. Krista Maxson mentioned a flipped/inverted Masters for educators teaching dual enrollment courses. Also a flipped Introduction to Statistics is in progress.
 - Dr. Null discussed an approach where developmental students cannot fail more than once. Students are put into a cohort with others who are struggling. There is a companion course with a lab component. They are currently a couple of years into the experiment with Pre- and Introductory Algebra.
 - Why would high school teachers want to teach dual enrollment? It is more preparation and planning. There is no release time. What is the incentive?
 - Dr. Zeager mentioned a pilot College Algebra class where a 5th contact hour has been added along with a “Chapter Zero” as a review. Students are charged for 4 credits of tuition plus a \$50 fee for the extra course materials.
 - Dr. Tonge suggested requiring students to work over the summer to prepare for placement.
 - Dr. McNeal mentioned a Calculus I MOOC at OSU for no credit. There were 30,000+ students enrolled. Around 8,000 of these students finished. Gathering data on this course has not yet been attempted.
 - After Calculus I at OSU there is a bifurcation into approximately 8 varieties of calculus.
 - Would it be possible to make a MOOC available to the high schools? Revenue issues are a concern nationally.
 - Dr. Maxson mentioned a MOOC at San Jose with customized course content that is similar to a flipped classroom that might be a great case study.
 - Cuyahoga Community College has a grant pilot underway to develop a developmental education MOOC for mathematics.
 - There is a standalone report on developmental education that Dr. Stitz recently received a draft of via email. There are two versions 2011 and 2013. Mr. Mike Snider is going to check into the newest report.
 - Dr. Zeager recalled when the state first allowed technical schools to grant AAS and AS degrees. He helped schools create the needed OTM courses. The structure was already there for these new courses to transfer. Being an OTM panel member is difficult, necessary, and very good work.
 - Students and their success are our primary interest. The role of decision making should belong to the faculty and not legislators.

- What have we learned? Courses are not one size fits all. Students need to be matched up with the right type of delivery.

VII. Meeting of the University System of Ohio Mathematics Chairs Discussion

- There is an interest in having a 2nd Mathematics Summit.
- Once the Steering Committee has made recommendations, the Mathematics Chairs would be a great group for testing the practicality of the recommendations. The assistance of the Mathematics Chairs may be needed both sooner and later.
- There is a spring Mathematical Association of America (MAA) meeting of chairs in March. Dr. Tonge will send Dr. McNeal information on what has been successful about the MAA chairs meetings.
- The Ohio Board of Regents (OBR) needs to ensure the right people are at the 2nd Mathematics Summit.
- There are courses in Oregon of Calculus I, II, and III with high level students where all computations come in via computer.
- There was a question about the program approval manual. Dr. Davidson said that the program approval manual is no longer relevant. Moving forward there will be the [Ohio Board of Regents' Guidelines and Procedures for Academic Program Review](#). There was a review period of the draft guidelines that closed on September 6, 2013. A Chancellor's Directive will be coming soon.
 - The guidelines need to be added to the list of policies for the steering committee to consider during their work.
 - The Engineering program at Lorain County Community College is already being affected. It is not known if they need OTM or technical mathematics for their program. Decisions are being made on outdated data.
- Dr. Tonge asked a question about who should be making the equivalency decisions for out-of-state transfer students. This question arose because his institution is not accepting the recommendation of the mathematics department. Dr. Paula Compton replied that there is not a statewide policy for out-of-state students; the decision rests entirely with the individual institutions.

VIII. Reflections

Dr. Treisman commented that this is a good group with a good mixture of members. There is a lot of potential, but everyone will need to be humble and careful.

Additional Discussion:

- Are there currently any local innovations that can be done to scale in the diversity of Ohio?
- We don't always know much about our successes, because we tend to hear more about our failures. We need to present while leaning toward the positive. We need clarity about what we are doing really well.
- May start the report with the things that we did well over the last decade, and then discuss what is coming next.

- “You can’t change culture, but you can culture change.”
- There is power in developing strong relationships across our institutions
- What are all the mathematics related committees in Ohio? A topographical map would be helpful.
- Ohio is a decentralized state. What does this mean for local content or structure changes?
- Can we use modern technology to our advantage?
- Can we keep courses the same, but have better pedagogy?
- We need a process to search for participants. Can the local areas do it? Can we use our connections to do good work?

A few things to consider:

- What are a few things that can be done that will have a big impact?
- Policy change is hard across large institutions. Which majors and which mathematics?
- Where do we have the most influence?

IX. Next Steps

The next Mathematics Steering Committee meeting is October 4, 2013 in B-004. Dr. Treisman and Ms. Cullinane will let us know if they will attend in person or via Webinar. Dr. Tonge will be unable to attend due to a centennial celebration of the mathematics department at Kent State University.

Additional Notes:

- A tentative schedule of work will be sent via email soon.
- A reading/resource list will be coming from Dr. Treisman and Ms. Cullinane
 - CBMS data analysis 2010 from all the institutions
- What questions do we need answers to for the things we are trying to accomplish? Copy Dr. Compton in on emails, so the questions/answers may be noted.
- There needs to be an emphasis on how mathematics is enabling advancement in every field.
- What happens next? OBR and Councils will develop a group of people to help with change. There will be a need for resources.

X. For the Good of the Order

There being no further business for discussion, the second meeting of the Ohio Mathematics Steering Committee was adjourned.