Math Pathways and the Ohio Math Initiative
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The Ohio Math Initiative (OMI) - what it is, how it works

The OMI is a response to calls for change to deal with several important issues in the state of Ohio:

- high failure rates in mathematics courses
- difficulties in transferring credit among Ohio public institutions
- high percentage of students requiring remediation
For example:

- For two-year colleges 58.5% of students require remediation (in math & English)
- For four-year colleges 25% of students require remediation
- African-American, Hispanic, and low-income students are more likely to require remediation.
The Ohio Mathematics Initiative (OMI) is a process that was started in 2013 to reach broad faculty consensus on how to tackle some of these important educational issues across the 36 public institutions in the state of Ohio.
The Ohio Department of Higher Education, formed the Ohio Mathematics Initiative (OMI) Steering Committee in summer 2013 to study issues and make recommendations for change.

- Steering Committee comprised of 6 mathematics faculty from universities, 5 from two-year colleges, and was chaired by Joan Leitzel.
- Two consultants, Uri Treisman and Jenna Cullinane, University of Texas at Austin.
The final report of the Steering Committee identified five goals.

1) Develop high quality entry level courses and pathways

2) Develop Transfer policies which are flexible and focus on student learning outcomes

   Develop a network of Math Chairpersons aiming at having better overall communication across campuses

3) Improve Mathematics instruction while collecting, analyzing and sharing relevant data.

4) Improve student success: align post-secondary expectations with High School practice.
Goal # 1) is based on a “diagnosis” of some of the problems identified earlier:

There is a lack of adequate initial (gateway) math courses that are well-linked to the student’s intended area of study.
Figure: Math Course Progression Chart at Ohio State
Figure: Algebra courses form the “trunk”
Figure : Calculus courses are some of the “leaves,” and this is basically a “STEM-tree”
Figure: Some terminal courses that do not involve calculus.
Figure: Goal #1)
- I note that 3) led to the formation of a network of Chairs of Math Departments in the State of Ohio.
- However, it turned out that Item 3) addressed much more than a communication issue:
- It also created a space for democratic processes to take place which then lead to policies at the level of the state of Ohio.
Figure: The Network of Chairs and its democratic structures help ensure that what becomes “official policy” originates at the “grassroots” level in the state of Ohio.
What is being done?
Figure: Three pathways have recently been developed, and a fourth one for Early and Middle Childhood Education, is in development.
- Statistics Pathway - Social Work, Nursing, Nutrition etc.
- Quantitative Reasoning: Communication, Fine Arts, Education etc. Emphasizes quantitative thinking and problem solving using quantitative methods.
- STEM Pathway: Chemistry, Math Education, Engineering, Physics etc.
- Early and Middle Childhood Pathway is in the planning stages.
Why Ohio State University is leading this effort

- OSU has been very interested in educational issues for a while, and has been quietly building a “Math Education Group.” Only because of the presence of such a group OSU was able to step in and lead in this process.

- Some key tenure-track hires in 2002 and in 2014 involving Math Education:
  - Herb Clemens was hired in 2002 at the rank of Professor
  - Jim Fowler was hired in 2014 at the rank of Assistant Professor
Several “clinical faculty” appointments were made in the past 10 years.

By and large, instructional innovation in the Math Department at Ohio State has been driven by the work and enthusiasm of a group of faculty members who are not tenure-track faculty members.
OMI of course fits with what is being done in other states and is strongly influenced by the work of the The Charles A. Dana Center.

- The Ohio Math Initiative very early on asked Uri Treisman to be a consultant. He is Executive Director of the Dana Center and strongly influenced the process.

- I know that in the state of Georgia there is a similar effort underway since 2013. Colorado started doing something similar in 2014. In California there is interest in doing something like this in the future.
The STEM pathway also requires improvement. One strategy we are pursuing is to identify students that would benefit from taking a year-long Calculus One course which would include some College Algebra material. This strategy is being pursued at Colorado State University.

We are consulting with a faculty member, Jessica Ellis, from Colorado State.
Thank you!