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AMERICAN MATHEMATICAL ASSOCIATION OF TWO-YEAR COLLEGES • 13 NOV 2020

NEW RESEARCH AND PRACTICE FRONTIERS IN THE TWO-YEAR COLLEGE LANDSCAPE

AGENDA

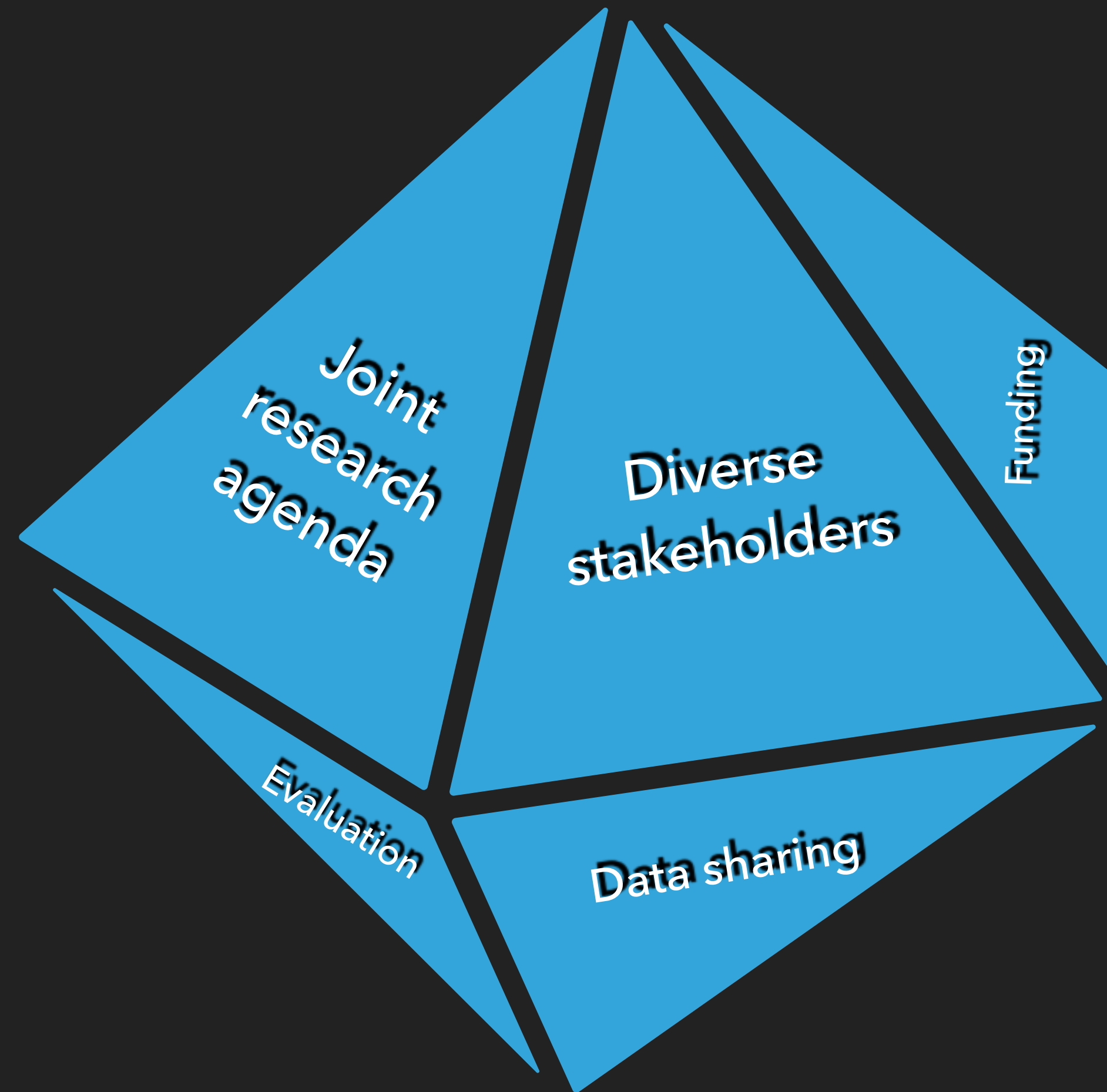
- ▶ The nature of research-practice partnerships
- ▶ Areas of critical need in mathematics education
- ▶ Examples from the field
- ▶ Discussion and call to action

CREATING A RESEARCH- PRACTICE PARTNERSHIPS

WHY ARE RESEARCH-PRACTICE PARTNERSHIPS IMPORTANT RIGHT NOW?

- ▶ Need for stronger articulation in mathematics teaching and learning across the 6-16 spectrum
- ▶ Rise in both students and faculty that 'cross over' between institutions
 - ▶ College-in-high-school credit-bearing programs
 - ▶ Transfer and reverse transfer agreements
 - ▶ Increasing reliance on adjunct faculty members at all levels
- ▶ **How do we justify that the work we do is making a difference with students?**

KEY FACETS OF A RESEARCH-PRACTICE PARTNERSHIP



DEVELOPING A JOINT RESEARCH AGENDA

- ▶ This doesn't have to be fancy or elaborate!
- ▶ Focus on real-world priorities
- ▶ Develop multiple levels of inquiry
- ▶ What's the one thing that if we learn about, we'll consider the work successful?

DIVERSE STAKEHOLDERS

- ▶ Research-practice is a spectrum – where is your work on it?
- ▶ Four As
 - ▶ Access
 - ▶ Acumen
 - ▶ Availability
 - ▶ Attitude

DIVERSE STAKEHOLDERS

- ▶ A small, committed team may be better than a large, scattered one
- ▶ Differentiate roles and allow for flexible movement
- ▶ Set up regular opportunities to re-evaluate and recruit additional folks

EVALUATION AND DATA SHARING

- ▶ How are we collectively defining success?
- ▶ Who's responsible for helping us understand if we're making progress?
- ▶ Who will have access to data, by what means, and for how long?

AREAS OF CRITICAL NEED

**LET'S DISCUSS.
WHAT ASPECTS OF YOUR WORK WOULD BENEFIT
FROM A RESEARCH-PRACTICE PARTNERSHIP?**

CRITICAL NEED AREAS IN SECONDARY-TERTIARY MATHEMATICS EDUCATION

- ▶ Curricular overlap between secondary and early college mathematics
- ▶ Efficacy of research-based pedagogical practices in early college mathematics
 - ▶ NCTM 8 effective mathematics teaching practices
 - ▶ Practice-based frameworks (5 Practices, number talks, etc.)
- ▶ Mathematics needed for majors/careers & alignment with course content
- ▶ Developmental mathematics

CASE 1: THE M³ PARTNERSHIP

THE CREATION OF A COMPREHENSIVE, QUALITY PUBLIC EDUCATION NETWORK THAT LIFTS OUR CITY AND NURTURES OUR STUDENTS AS THEY DEVELOP INTO THE CRITICAL THINKERS, STRONG LEADERS AND INNOVATORS WHO WILL HELP MILWAUKEE THRIVE FOR DECADES TO COME. WE WILL TRANSFORM THE WAY WE EDUCATE STUDENTS AND MAKE IT EASIER FOR STUDENTS TO TRANSITION BETWEEN OUR INSTITUTIONS.

M³ Vision

M³ GOALS

1. Raise aspirations, readiness and student success
2. Educate families about the value of post-secondary learning
3. Align curriculum and services from middle school to post-secondary education to create a seamless system
4. Create and cultivate a culture of learning in which there is an expectation to continue education after high school
5. Engage the student voice, provide safe spaces, and commit to equity and inclusion

ALIGN CURRICULUM AND SERVICES FROM MIDDLE SCHOOL TO POST-SECONDARY

- ▶ Curricular articulation in subject areas to reduce overlap for students
- ▶ Cross-level professional development around key mathematical ideas
 - ▶ High cognitive demand tasks
 - ▶ Productive struggle
- ▶ Focus on strengthening pathways to credit bearing mathematics

TARGETS: COMPLETING FOR-CREDIT MATH AT MATC AND UWM IN FIRST YEAR

Strategies:

- Design and implement a professional development series to ensure curriculum alignment between MPS and MATC/UWM and to develop faculty and staff leaders in English Language Arts (ELA), Math and Science.
- Address math deficiencies prior to high school graduation to ensure readiness for college level work.
- Provide for early math placement testing and begin remediation, including Saturday while students are still in high school.

Targets: (Current: 2015-2016)

2015-2016: 57% MATC, 64% UWM	2016-2017: 60% MATC, 67% UWM	2017-2018: 63% MATC, 69% UWM	2018-2019: 66% MATC, 71% UWM	2019-2020: 68% MATC, 75% UWM	2020-2021: 70% MATC, 79% UWM
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CRITICAL OUTCOMES THUS FAR

- ▶ Common language for talking about teaching, student thinking, and student learning
- ▶ Realignment of the high school-college mathematics pathways
- ▶ Meaningful reforms to developmental mathematics coursework
- ▶ Push to de-emphasize college algebra as the primary credit-bearing course and shift to quantitative reasoning
- ▶ Development of meaningful 4th-year math courses in Milwaukee Public Schools

CASE 2: SUCCESSFUL TRANSITIONS TO COLLEGE PROJECT (EWU)

SUCCESSFUL TRANSITIONS TO COLLEGE PROJECT INQUIRIES

- ▶ Creating a math classroom environment that promotes independent learning and perseverance
- ▶ Transferring knowledge from precalculus to calculus
- ▶ Helping math students think critically about what they read
- ▶ Observing a culture of student independence

FINDING COMMON GROUND IN THE RPP

- ▶ Worked to collectively define the problem
- ▶ Collaboratively designed observation protocol based on shared values
- ▶ Observed one another's teaching across levels (HS-2YC-4YC)
- ▶ Forged a path forward for intervention

CALL TO ACTION

WHAT YOU CAN DO

- ▶ Meet informally with colleagues across levels to discuss shared challenges
- ▶ Make use of local and state professional associations
(NCTM, AMATYC, AMTE affiliates)
- ▶ Use professional standards and guidelines as a grounding point

WHAT YOU CAN DO

- ▶ Seek funding internally and externally
 - ▶ Spencer Foundation, Gates, and the National Science Foundation fund RPPs
- ▶ Tackle modest problems that can scale
- ▶ Don't feel like you need to change the world all at once
- ▶ Share in-progress work back to the professional communities

**WHAT ARE YOU
WONDERING ABOUT?**