TPSE Departmental Self-Assessment Framework
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COME-IN
Creating Opportunities in Mathematics through Equity and INclusion

TPSEMath
Transforming Post-Secondary Education in Mathematics

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COME-IN: Creating Opportunities in Mathematics through Equity and INclusion

COME-IN: Creating Opportunities in Mathematics through Equity and Inclusion is intended to guide a department in the mathematical and statistical sciences through a holistic assessment of its policies, practices, and outcomes related to equity, diversity, and inclusion (EDI). It is a structured yet flexible guidance for collecting and interpreting data in a way that is adaptable to departments in different contexts. A department that begins collecting data and making meaning from those data using this guidance is going to be well-poised for a deeper dive into a strategic planning process.
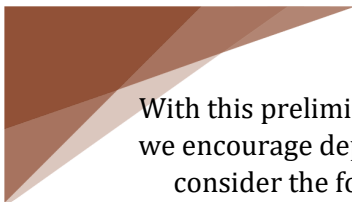
COME-IN was developed by a working group of 16 mathematicians, diverse in the types of institutions they hail from; their ethnic, cultural, racial, and gender identities; and their leadership roles in mathematical sciences societies (see Appendix I). The working group adapted the core criteria for Departmental Bronze Awards from STEMM Equity Achievement (SEA) Change—a flagship program of the American Association for the Advancement of Sciences (AAAS)—to the needs and challenges of the mathematical and statistical sciences. The working group highlighted the gatekeeping role played by mathematics for all STEM disciplines and worked to ensure the framework was relevant for departments at 2-year, 4-year, and research-intensive institutions and in disciplines across the mathematical sciences.

This preliminary release of COME-IN contains sample guidance from these core criteria along with additional material developed specifically for our field. The complete set of criteria are under consideration for a formal pilot with AAAS SEA Change. In the interim, this preliminary release is intended to demonstrate the process of self-assessment with quantitative and qualitative data for academic departments in the mathematical and statistical sciences to consider policies and practices that affect EDI outcomes among its members.

How to use the COME-IN framework

COME-IN leads change teams through a self-assessment of your department or program in three stages: the department overall, pathways, teaching, and curriculum, and specific experiences of students, faculty, and staff. In this preliminary release, we present samples of the guiding questions for the department overall, pathways, and some specific guidance for each departmental population. We also provide the full guidance for teaching and curriculum, which was developed by the COME-IN task force. Some of these questions may seem simple, and others obtuse or difficult to answer. We intentionally include some questions for which your department may not have immediate answers, as a way of encouraging you to think about equity, diversity, and inclusion in mathematics at a very broad level.

With this preliminary release, we encourage departments to consider the formation of a change team to begin to collect information and make meaning of the resulting data, including a comprehensive holistic assessment of teaching and curriculum.

The tool is designed to help you understand the different experiences and outcomes for all people who interact with your department: students, faculty, and staff, of different races, ethnicities, gender identities, nationalities, and disability status.

Step 1: Collect data

We encourage your change team to collect evidence to address each question in turn. Although your personal experience and intuition will provide important insights, a combination of qualitative and quantitative data may provide some surprises.

The evidence your department considers should include both *quantitative* data—numbers, graphs, statistics, and other metrics—and *qualitative* data—documents, policies, observations, interviews, photographs, biographies, and other information that cannot be captured by numbers alone. For example, you might look at numbers of graduate students who matriculate and those who complete their intended degree, to see if there are any disparate outcomes by race, ethnicity, or gender. Such numbers, while useful, can't tell you *why* those numbers are what they are. Is it because students of Color have a harder time finding mentors and advisors? Do they have disproportionate financial burdens? Are they encountering a hostile culture among their peers? Answering these questions requires a different type of data. You might gain important insights by interviewing students at the end of their first, second, and third years; students who leave before completing their intended degrees; and faculty. Or you might review policies and practices about the types of financial support students receive and their assistantship assignments. Are there practices that inadvertently have an inequitable impact on some groups of students? Qualitative data can also suggest important questions to investigate through quantitative data, or the reverse. You'll need both quantitative and qualitative data to obtain a complete understanding of EDI outcomes in your department.

Step 2. What does the data tell you?

Collecting data is, of course, only the first step. As your change team proceeds in your assessment, disaggregate all data by **race, ethnicity, gender identity, nationalities, disability status, and all of their overlaps and intersections**. Then, look for patterns, trends, and differences. *Focus on outcomes*. Even a policy that appears fair on its surface can have differential outcomes for different groups of people, regardless of intent or structure. For example:

- Are resources and opportunities allocated equitably?
- If resources are limited, how are decisions made about who gets what?
- How do students, faculty, and staff learn about opportunities?
- What rubrics, metrics, or other criteria are used to ensure consistent and equitable experiences and opportunities?
- How are the mathematical sciences, the thinking about mathematics, and mathematicians represented in the curriculum?
- Do people of all races, ethnicities, gender identities, nationalities, disability, and their intersections have equitable access to high quality educational and career experiences and outcomes?

Step 3. What can you do next?

Your departmental change team should examine your self-assessment and identify findings that surprised you most, or that you find the most urgent. The team will probably need to dig more deeply to find the root cause of some findings. Consider: What did you learn? What else do you wish you knew? How can you learn more?

Part I: The Department Overall

The questions in this section encourage your change team to look at your department overall. Keep in mind *all* people who interact with your department: students, faculty, and staff. As you collect qualitative and quantitative data, separate that data as you can to describe the different experiences and outcomes for people of different races, ethnicities, gender identities, nationalities, and disability status. Although some of these questions may seem to have obvious or simple answers, as we know as mathematicians, sometimes the most interesting findings are hiding within the "obvious"!

1. Context: What is your Department?

1.1. What encompasses the *department* you're investigating? Is it a single academic unit, a school of mathematics, a particular program within one of those?

1.2. What academic programs are in the department, including undergraduate majors and minors, Master's and PhD programs, bridge programs, REUs, and interdisciplinary programs.

1.3. What role does your department play in educational service courses for the general undergraduate population?

2. Composition: Who is in your Department?

2.1. How many undergraduate, graduate, postdoc, faculty, and staff members are in the department, separately by race, ethnicity, gender identity, and any other personal or professional identities?

2.2. Compare these data to a benchmark, such as a national dataset for your discipline(s), the US academic population overall, and/or the makeup of your institution.

3. Policies

3.1. What departmental or institutional initiatives support EDI? Does the department have explicitly stated policies or practices for enhancing EDI? What are they?

3.2. How does the department ensure that legal requirements, including disability accommodations and Title IX requirements, are implemented appropriately?

3.3. Are faculty and staff encouraged or required to receive training on EDI? Do they receive training on how to cultivate inclusive work and lab environments?

3.4. What responsibilities do faculty and staff have for promoting EDI? What feedback do they receive in their effectiveness?

3.5. What is the impact of EDI-related work on evaluation and promotion?

4. Sexual Harassment and Assault

4.1. What are the department's and institution's policies on sexual harassment? How are violations handled? How is the privacy and safety of both victims and those accused protected?

4.2. What training is offered or required about sexual harassment and assault?

4.3. What services are available to victims and those accused of sexual assault?

5. Role models and Diversity

5.1. How is EDI reflected in invited talks, colloquia, seminars, other events, and the event organizers?

5.2. How does the department highlight the accomplishments of all its members?

5.3. How is EDI reflected on the department and university websites, printed materials, and other communications?

6. Recruitment and Hiring

6.1. Are requirements regarding interpersonal skills, including those related to EDI, explicitly stated? Which skill sets and experiences are required, and which are optional?

6.2. Who is in the potential candidate pool of each process and strategy, and what are the outcomes of each? How are candidates recruited across the range of personal and professional identities?

6.3. What is the composition of the applicant pool, short-listed candidates, interviewees, those who receive job offers, and those who are hired?

6.4. How are search committees formed? What training or guidelines are provided to the committee?

6.5. What does the department do to assess and correct salary inequities?

7. Mentoring

7.1. Does the department have a formal definition of mentoring, separately from advising?

7.2. What training is provided to students, faculty, and staff to be effective mentors and advisors?

7.3. Are cultural competency and other EDI issues included in mentor training?

7.4. How does the department assess and track the mentoring needs of its members and how those needs are (or are not) being met? What metrics are used?

7.5. How do members of the department, especially those from underrepresented groups, learn to build and cultivate successful mentorship relationships?

8. Flexible Timelines, Caregiver Support, and Effect on Evaluation

8.1. What are the policies regarding personal and family leave and caregiving responsibilities?

8.2. Are classes, advising, work hours, meetings, and other programs and activities scheduled to accommodate students, faculty, and staff who have caregiver or other responsibilities?

8.3. Do undergraduate and graduate students, faculty, and staff have access to family care resources including childcare and lactation rooms?

9. Evaluation and Performance Review

9.1. What processes are in place to review academic or career progress? What evaluation metrics or rubrics are used?

9.2. How are evaluation results used in policy, staffing, resource allocation, and career progression?

9.3. How is the balance among learning, teaching, research, and service considered in all forms of evaluation?

9.4. Who performs performance reviews for students, faculty, and staff? What training is provided or required of those who participate in performance review?

9.5. In what ways are evaluation results used in department policy, staffing, resource allocation, and career progression?

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Part II: Pathways, Teaching, and Curriculum

This section will guide your change team through a review of what you teach, how you teach it, and who you teach it to. We invite you to reflect upon your department's curricular pathways, with an eye to who has access to which pathways, how those decisions are made, and where those pathways lead. These issues have important equity implications. For instance, historically racially minoritized students are disproportionately placed into pathways that too often are not in line with their needs, and through which few students successfully emerge, often due to flawed placement exams or other metrics. Some research shows that women are more likely to explore other majors and find barriers in place when they attempt to return to mathematics.

Include undergraduate and graduate students, majors and minors, math students, STEM students, and students outside of STEM. Some of these questions may seem simple, and others obtuse or difficult to answer. We intentionally include some questions for which you may not have immediate answers, as a way of encouraging you to think about equity, diversity, and inclusion in mathematics at a very broad level.

Disaggregate your qualitative and quantitative data to describe the different experiences and outcomes for people of different races, ethnicities, gender identities, nationalities, and disability status.

1. Teaching and Pedagogy

1.1.   What teaching pedagogies (e.g. flipped classroom, growth mindset learning, guided discovery, collaborative problem-solving sessions) are used in gateway courses?

1.2.   Are equitable practices implemented in pedagogy? Are students at the center of learning?

1.3.   Which pedagogies are faculty exposed to?

1.4.   Are curricular materials shared among instructors in course development?

1.5.   Is access to online courses and other learning technologies equitable?

2. Entry Level Courses

2.1.   How are students placed into pathways that meet their needs and facilitate their advancement?

2.2.   What measures used to place students into their initial mathematics courses? How are the outcomes of these placements assessed?

2.3.   How are students supported to succeed in credit-bearing courses in their first year?

2.4.   Are students invited and encouraged to take next-level courses?

2.5.   Are there multiple points of entry into majors and graduate programs in the mathematical sciences?

3. Student pathways

3.1.   What supports (e.g. tutoring, advising, co-requisites, Emerging Scholars Program) are in place to help both majors and non-majors advance?

3.2.   How are students encouraged to think about the mathematical sciences as tools to understand and address problems (e.g. climate change, income and wealth disparities, incarceration disparities)?

3.3.   What are the curricular pathways or programs for non-math/statistics majors to enter graduate studies in mathematical or statistical sciences?

4. Curriculum, Ethics, and Societal Issues

4.1.   How are the social and ethical implications of the mathematical sciences represented in the curriculum (e.g. model assumptions and bias, bias in data collection and analysis)?

4.2. Are the mathematical sciences discussed in a social context, including its use and misuse in addressing and sustaining social problems and oppression?

4.3. Is the social context of mathematical sciences discussed, including who succeeds in mathematics and why?

4.4. Are majors required to take courses outside the department that specifically address these issues?

5. Inclusivity and representation in the curriculum

5.1. Are culturally sensitive and culturally diverse examples used in the curriculum? For example, is the Marriage Problem presented in ways that assume gender binary or heteronormativity?

5.2. Does the curriculum represent mathematical scientists from a diverse range of identities and backgrounds? Are students and faculty expected to credit the work of a diverse range of authors in research and/or teaching (e.g. recognizing that "Fibonacci" sequences were recognized by Indian mathematicians hundreds of years before Fibonacci)?

5.3. Are courses designed to be accessible without separate ADA accommodations (e.g. are curricular materials and course sites accessible to screen-readers and other assistive technology)?

6. Math as a service course to other disciplines

6.1. What are the department's efforts to recruit undergraduate and graduate students into STEM fields?

6.2. Are undergraduate and graduate students encouraged to take mathematics courses beyond what is required for their degree program?

6.3. Does the department collaborate with other departments to coordinate curriculum in and scheduling of required courses?

6.4. Are there inequities evident in the curriculum offered for non-majors?

7. Disciplinary Inclusion

7.1. Are undergraduate and graduate students exposed to the range of modern mathematics, including applied mathematics, statistics, programming, data science, math and statistics education, and related fields?

7.2. Do these mathematical science disciplines have equivalent stature and visibility in the department, including awards, representation at colloquia, and resources (e.g., work space, graduate student funding)?

7.3. What are the differences among the traditions, practices, and culture of these disciplines?

7.4. How do students, postdocs, and faculty within these disciplines interact?

7.5. Which research, career, courses, and other opportunities are available for undergraduate and graduate students in different mathematical sciences disciplines?

7.6. Can students switch between disciplines? Are there patterns in which students enter into or switch among disciplines?

Part III: Additional Considerations for Students, Faculty, and Staff

Due to their different roles and goals, some policies, practices, and experiences are unique to undergraduate and graduate students, postdocs, faculty, and staff. The COME-IN framework encourages your change team to consider these population-specific questions to get a complete picture of the experiences and outcomes for all members of your department.

Undergraduate Students

1. Recruitment, Matriculation, and Financial Aid

1.1. How are students recruited into department programs and into STEM majors overall?
1.2. Are there articulation agreements with other institutions, particularly 2-year colleges?
1.3. What types and how much financial support are available to students?

2. Persistence, Retention, and Completion

2.1. What are trends over time in enrollment, retention and degree completion?
2.2. Are there differences in students who persist with those who leave the department programs, switch majors, and leave the institution?

3. Evaluation and Grading

3.1. How are students placed in their first-year courses? Do these placements allow them to successfully complete majors in the department and in STEM?
3.2. Are evaluation, feedback, and grading practices standardized across courses?
3.3. How, and how often, do students receive feedback on their academic progress?

4. Professional Development

4.1. How are students prepared to apply to and enter into graduate school?
4.2. Do students have opportunities to participate in research, and to attend and present at professional meetings?
4.3. What opportunities are available for students to learn more about pedagogy, both at the K-12 and postsecondary levels?
4.4. Are there leadership training and positions for students?

5. Flexible Timelines, Caregiver Support, and Effect on Evaluation

5.1. How does personal or family leave affect degree progress and retention?

Graduate Students

1. Recruitment, Financial Support, and Matriculation

1.1. What are the formal and informal processes and strategies for recruitment, and what are the outcomes of each? How are candidates recruited across the range of personal and professional identities?
1.2. What is the composition of the applicant pool, short-listed candidates, interviewees, those who receive offers, and those who matriculate?

    1.3.   Are there articulation agreements with bridge programs, four-year colleges, and minority-serving institutions?

    1.4.   How are members of the admissions committee selected? Do committee members receive training or documentation about policies and practices?

2. Pre-Candidacy and Candidacy; Retention and Completion

    2.1.   What are trends over time in enrollment, retention, and degree completion?

    2.2.   What is the average and range in time to candidacy and time to degree?

    2.3.   What resources support students in coursework, exams, research, and other requirements?

    2.4.   Are policies, procedures, and requirements transparent and available to all students?

3. Evaluation

    3.1.   How are TAs, RAs, GAs, and other student employees evaluated?

    3.2.   How, and how often, do students receive feedback on their academic progress?

    3.3.   What evaluation metrics or rubrics are used?

4. Mentoring

    4.1.   How do students learn to build and cultivate successful mentorship relationships to support them in their coursework, research, and career development?

    4.2.   Are graduate students rewarded for excellence in mentoring? What metrics are used?

5. Career and Professional Development

    5.1.   What career development opportunities are available (e.g., teaching, leadership, manuscript and grant writing, oral communication, mentoring undergraduate students)?

    5.2.   How are students supported in the transition from graduate school to careers (e.g. seeking funding, writing CVs or resumes)?

    5.3.   Are graduate students given opportunities and support to attend and present at scientific meetings?

    5.4.   Do members of the department actively advocate for graduate students for awards and other opportunities?

6. Flexible Timelines, Caregiver Support, and Effect on Evaluation

    6.1.   How does personal or family leave affect degree progress and retention?

    6.2.   What are the implications of family leave on financial support and other benefits before, during, and after returning to work?

    6.3.   How is personal or family leave reflected in evaluation, including eligibility for RA, TA, and other forms of financial support and any awards or honors?

Postdoctoral Scholars

1. Advancement, Independence, and Completion

    1.1.   What is the range and average time to completion or time spent in the postdoc overall?

    1.2.   What support does the department provide to postdocs in finding future positions?

    1.3.   What is the effect of teaching and other responsibilities on research productivity?

    1.4.   Does the department or school provide support in the transition from postdocs to careers?

2. Evaluation

2.1.   How are postdocs evaluated? How often do they receive feedback? What rubrics are used?

3. Mentoring

3.1.   How do postdocs learn to build and cultivate successful mentorship relationships to support them in their teaching, research, and career development?

3.2.   Are postdocs rewarded for excellence in mentoring? What metrics are used?

3.3.   Are postdocs given opportunities to work with faculty mentors?

4. Professional Development

4.1.   What types of training and experiences are available (teaching, research, outreach, mentorship, project management, leadership, or other professional skills)?

4.2.   How are postdocs supported in preparing job applications (writing a CV, interview skills, writing a research statement)?

4.3.   Are postdocs encouraged and supported to attend and present their work at conferences?

4.4.   What mentoring do they receive on how to network effectively?

5. Flexible Timelines, Caregiver Support, and Effect on Evaluation

5.1.   What are the impacts of personal or family leave on financial support and other benefits before, during, and after returning to work?

5.2.   Can a postdoc requesting family leave request an extension of their appointment?

Faculty

1. Evaluation, Promotion, and Tenure

1.1.   What is the promotion and tenure process? How are T&P committees formed?

1.2.   What career pathways are available for instructional, part-time, adjunct and non-tenure-track faculty?

1.3.   How is service, and in particular service related to EDI, included in faculty review?

2. Retention

2.1.   What are trends in promotion, retention, and turnover time?

2.2.   Are there regular reviews of faculty satisfaction in the department?

2.3.   Where do faculty continue their careers after they leave?

3. Course Assignments

3.1.   How do faculty provide input on course assignments, including course delivery, scheduling, and courses for non-majors?

3.2.   Do faculty receive training on how to create inclusive classroom, lab, and work environments when working both non-majors and majors?

3.3.   What feedback do faculty receive on their roles in promoting EDI in their classrooms, labs, research projects, and in the department?

4. Mentoring

4.1. Are faculty aware of differences between advising and mentoring, as they apply to majors, non-majors, graduate students, postdocs, staff, and faculty in different career stages and roles?

4.2. Do faculty mentor their research groups?

4.3. How do faculty, especially those from underrepresented groups, learn to build and cultivate successful mentorship relationships, both as mentors and mentees?

4.4. Are faculty rewarded for excellence in mentoring? What metrics are used?

5. Professional Development

5.1. Are faculty given the opportunity and support to attend scientific meetings?

5.2. What training opportunities do faculty receive in pedagogy?

5.3. Do members of the department actively advocate for faculty for internal and external awards and other opportunities? How is the equity of award nominations monitored?

5.4. How do faculty gain experience in leadership roles?

6. Flexible Timelines, Caregiver Support, and Effect on Evaluation

6.1. How is personal or family leave, or the use of flex-time, reflected in evaluation, including promotion and tenure schedules, eligibility for research funding, and eligibility for awards and honors?

6.2. Are there other benefits available related to long-term care or other caregiving support?

6.3. How are a faculty member's teaching, advising, mentoring, research supervision, committee assignments, and other departmental service handled during personal or family leave?

Staff

1. Evaluation, Retention, and Promotion

1.1. Are there regular reviews of staff satisfaction in the department?

1.2. Does the department regularly assess turnover in department-funded, institution-funded, or grant-funded positions? Are there patterns of turnover associated with specific offices or positions?

1.3. Are exit interviews performed to survey the culture and climate of the department from the perspective of the staff?

2. Mentoring

2.1. Are staff rewarded for excellence in mentoring? What metrics are used?

2.2. Do stuff receive mentoring in career development?

3. Professional Development

3.1. Do staff receive continuing support for research and professional development beyond starting offers, including time, funding, students, and personnel support?

3.2. How are staff informed of and prepared for advancement opportunities?

3.3. What training or other opportunities are available to staff to enrich their knowledge base and prepare for advancement? What mentoring or feedback do they receive on career development?

4. Flexible Timelines, Caregiver Support, and Effect on Evaluation

4.1. Are there other benefits available related to long-term care or other caregiving support?

4.2. What policies and resources apply to part-time staff?

4.3.   What are the implications of personal or family leave on salary and other benefits before, during, and after returning to work?

Next Steps

This is only the beginning! If your department has found this preliminary release of COME-IN to be illuminating, keep engaging your change team in reflective work and plan to join in a strategic planning process as soon as it is available so that you may turn your findings into actions.

Appendix I: Members of the TPSE Working Group

TPSE Liaisons and Coordinators: Michael Dorff, Abbe Herzig, Alexis Knaub, David Kung

Ed Aboufadel, Grand Valley State University

Ron Buckmire, Occidental College

(Erika) Tatiana Camacho, Arizona State University

Carrie Diaz Eaton, Bates College

Ruth Haas, University of Hawai'i

Abbe Herzig, TPSE-Math

Alexis Knaub, TPSE-Math

David Kung, Charles A. Dana Center, University of Texas at Austin

David Manderscheid, University of Tennessee-Knoxville

Amaury Miniño, Colorado State University

Nancy Rivers, Wake Technical Community College (retired)

Julia Sharp, Colorado State University

Dylan Thurston, Indiana University

Cristina Villalobos, University of Texas Rio Grande Valley

Talithia Williams, Harvey Mudd College

Kamuela (Wela) Yong, University of Hawaii - West O'ahu