Transformations Working Group

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and the Transformations Working Group

From its inception, the Mathematics Teacher Education Partnership (MTE-Partnership) has had as its goal "transforming secondary mathematics teacher preparation" in alignment with the Common Core State Standards and other rigorous standards. As the MTE-Partnership subsequently adapted the Networked Improvement Community (NIC) design (Bryk et al., 2015), two aims were set: (a) increase the supply, and (b) increase the quality of secondary mathematics candidates, and a set of four primary drivers was identified. The MTE-Partnership disaggregated its work into five Research Action Clusters (RACs) addressing various aspects of the primary drivers, thus allowing the MTE-Partnership to "accelerate learning" through the power of the network (Bryk, et al., 2015, p. 141). This, however, results in a conundrum: Each partnership team generally is only involved in one (or perhaps two) of these RACs – meaning that they are addressing only some of the areas of critical need. To fully meet the aim of the MTE-Partnership, teams must integrate the work of the partnership across multiple RACs. However, accomplishing this will in many cases raises a number of significant challenges, including capacity and human capital, issues with the "will" to improve mathematics teacher preparation across stakeholder groups, and issues with institutional resources and support structures.

The Transformations Working Group was formed in Spring 2016, including members nominated by teams across the MTE-Partnership, with the following charge: "To establish a foundation for the MTE-Partnership's strategic focus on overall transformation of secondary mathematics teacher preparation programs." The approach proposed by the MTE-Partnership Planning Committee was that the Working Group design ways to support teams in creating "strategic pathways" to scale up incorporation of the MTE-Partnership's improvements with the ultimate aim of comprehensive program transformation, with a focus on building capacity and infrastructure, collaboration with K-12 and other stakeholders, and cross-team collaboration. The Working Group began its work at a meeting directly following the 2016 MTE-Partnership Conference. It met again in November 2016 and May 2017 and also held several conference calls. During these meetings, the group has explored the literature on institutional change (e.g., Corbol et al., 2016; Elrod & Kezar, 2016), conducted several surveys of the membership, and done extensive brainstorming on how to best support transformational change across the MTE-Partnership teams. Note that the Association of Mathematics Teacher Educators' (2017) *Standards for preparing teachers of mathematics* reiterates many of the conclusions reached by the Working Group.

Table 1

Transformation Working Group Members

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Mark Ellis, California State University, Fullerton	Jennifer Oloff-Lewis, California State University, Chico
Dana Franz, Mississippi State University	Robert Ronau, National Science Foundation
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Judy Kysh, San Francisco State University	Wendy Smith, University of Nebraska-Lincoln
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Proposal for Formation of a Transformations RAC

The initial work of the Working Group resulted in a proposal to form a new RAC. The proposed RAC includes attention to the MTE-Partnership primary driver, Creating a Vision. However, the partnership driver diagram may need to be revisited to better accommodate the new emphasis on program transformation. A key issue is that transformation efforts need to "see the system": considering all the components of teacher preparation, including people (pre-service teachers, K-12 teachers, K-12 administrators, university faculty, university administrators, state-level policymakers); interactions among people; institutions (colleges, K-12 schools); and the community. Transformation efforts need to understand how the local contexts together produced or perpetuate the current system before attempting to improve the system. A first draft of a revised MTE-Partnership driver diagram is provided in Figure 1, which proposes a new primary driver focusing on transformation that overarches the other primary drivers.
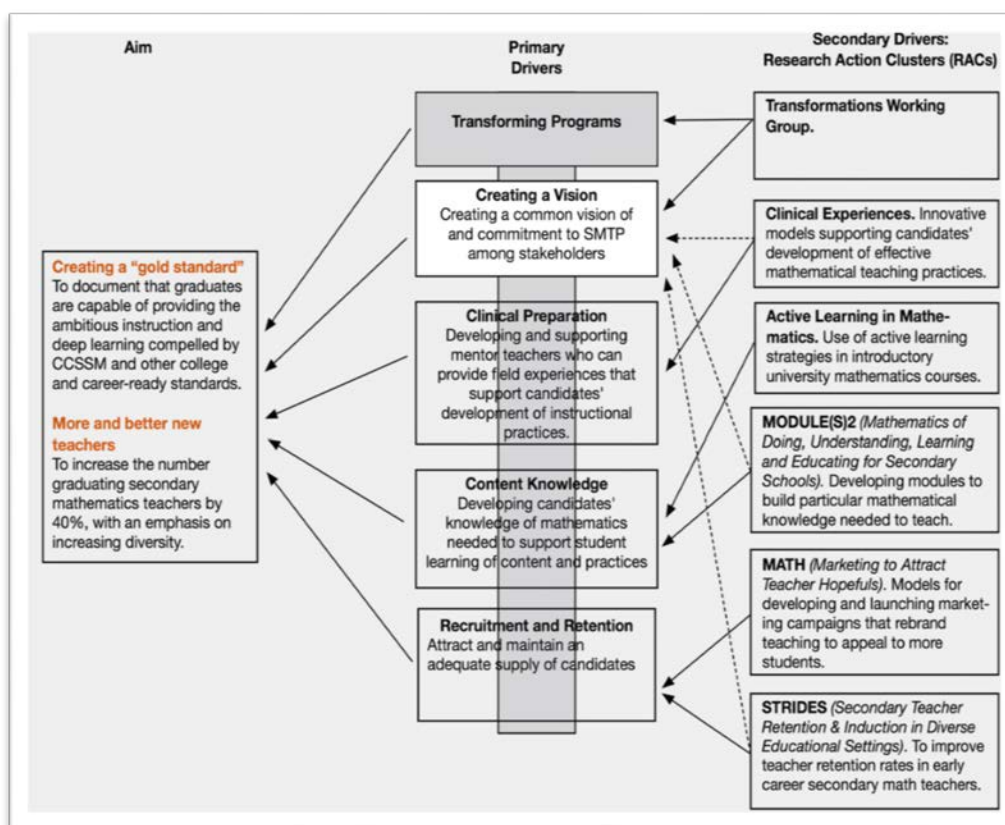

Figure 1. Proposed revision to the MTE-Partnership driver diagram.

Analysis of the Problem: Based on multiple discussions and data sources (including a recent survey of MTE-Partnership teams), problems and subproblems that impede progress toward program transformation were identified and organized into a fishbone diagram, given in Figure 2. A fishbone diagram is a tool that visually represents a group's causal systems analysis (sometimes known as a cause-and-effect diagram or Ishikawa diagram) (see https://www.carnegiefoundation.org/resources/learning-to-improve-glossary/ for more information).
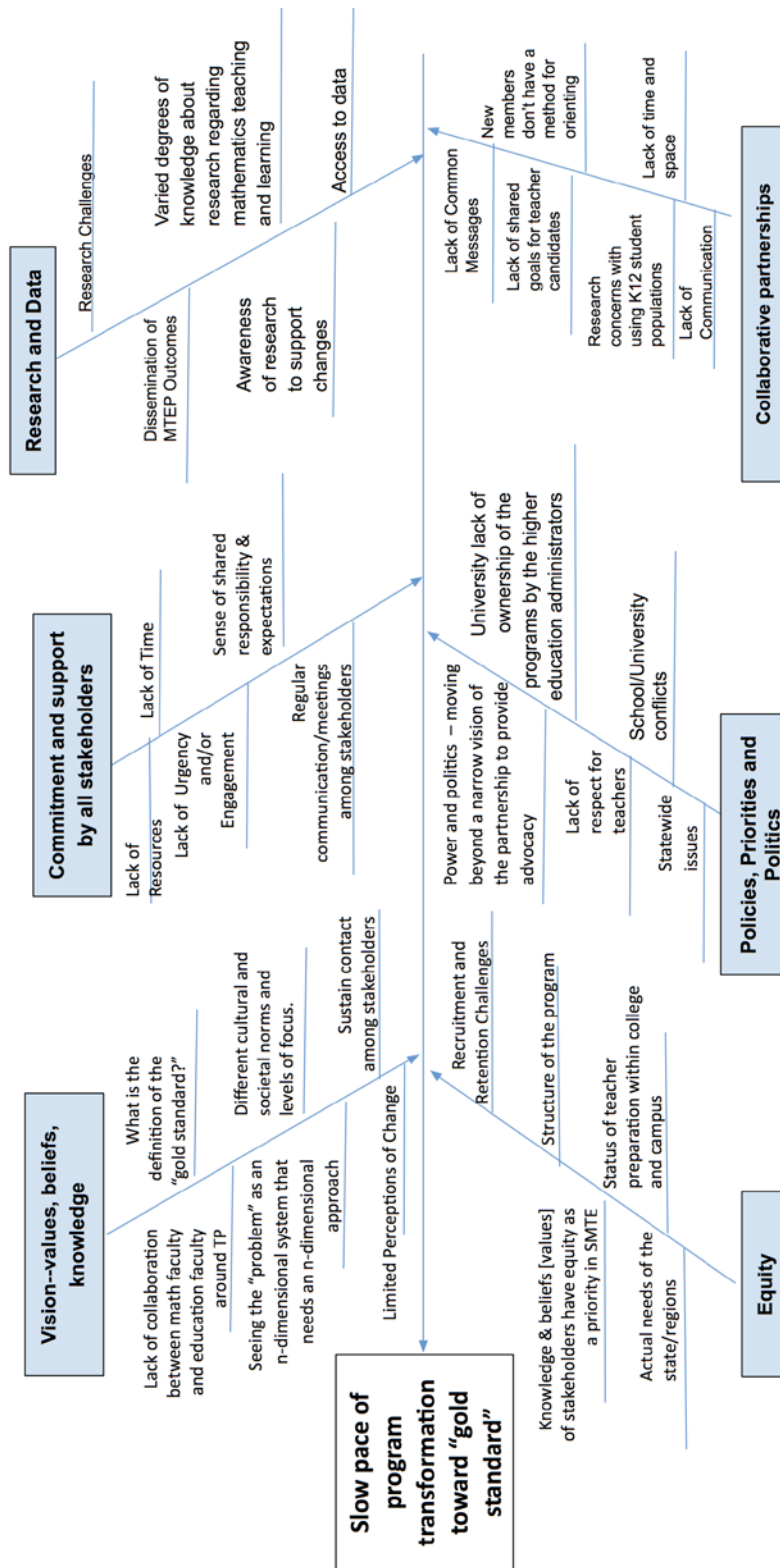
Note: TP=Teacher Preparation; SMTE=Secondary Math Teacher Education

Figure 2. Fishbone diagram representing the problem space for program transformation in secondary mathematics teacher preparation.

Aim: Based on its analyses of the problem space, the following aim is proposed to guide the emerging work in this area:

In order to attain the overall MTE-Partnership aim ("gold standard" as expressed in the Guiding Principles and number of candidates produced), N teams will be engaged in an **explicitly defined** continuous improvement process of overall transformation of their secondary mathematics teacher preparation programs by June 2019, in collaboration with other teams engaged in that process.

Several notes are made to better understand this statement:

- "Program" as used here includes the continuum from recruitment of future teachers of mathematics, undergraduate content coursework, early fieldwork experiences, methods coursework, fieldwork with mentor teachers in partner school districts, to early career induction support.
- In order to meet the condition, there must be an explicit plan for improvement for the program, including methods of documentation.
- Continued attention is needed as to whether the Guiding Principles sufficiently define the gold standard, particularly with respect to induction, in light of the new *Standards for the Preparation of Teacher of Mathematics* from the Association of Mathematics Teacher Educations; see www.amte.net/standards .
- "N" will initially be somewhat small (perhaps 10), but then expand to be more aggressive (perhaps up to 80), and then ultimately encompass all MTE-Partnership teams.

Driver Diagram: A Driver Diagram is a tool that visually represents a group's working theory of action to drive program improvement. The Driver Diagram creates a common language and coordinates the effort among the many different individuals joined together in solving a shared problem; see Figure 3. The first column includes the Primary Drivers, a representation of a community's hypotheses about the main areas of influence necessary to advance the improvement aim. The second column includes the Secondary Drivers, a small set of system components that are hypothesized to activate each primary driver. The final column includes Change Ideas, alterations to a system or process that are to be tested through a PDSA cycle to examine their efficacy in improving some driver(s) in working theory of improvement (see https://www.carnegiefoundation.org/resources/learning-to-improve-glossary/ for more information).

Next Steps

The Transformation Working Group provided two opportunities to engage teams in discussion about program transformation at the 2017 MTE-Partnership Conference:

1. During the working dinner following the opening keynote address addressing networked communities, teams were presented with a series of structured questions to help team members to explore their current context.
2. A discussion session was organized Monday evening to provide interested team members with an opportunity to discuss the work that has been done by the working groups and prospects for participation in program transformation as a part of the proposed Transformational Change Research Action Cluster (RAC).

Based on the feedback at the conference, the Working Group will devise and implement a process for teams to apply to join the RAC, tentatively in Fall 2017. In addition, members of the subgroup will be working to develop a white paper outlining relevant research and analysis underlying the development of the RAC.
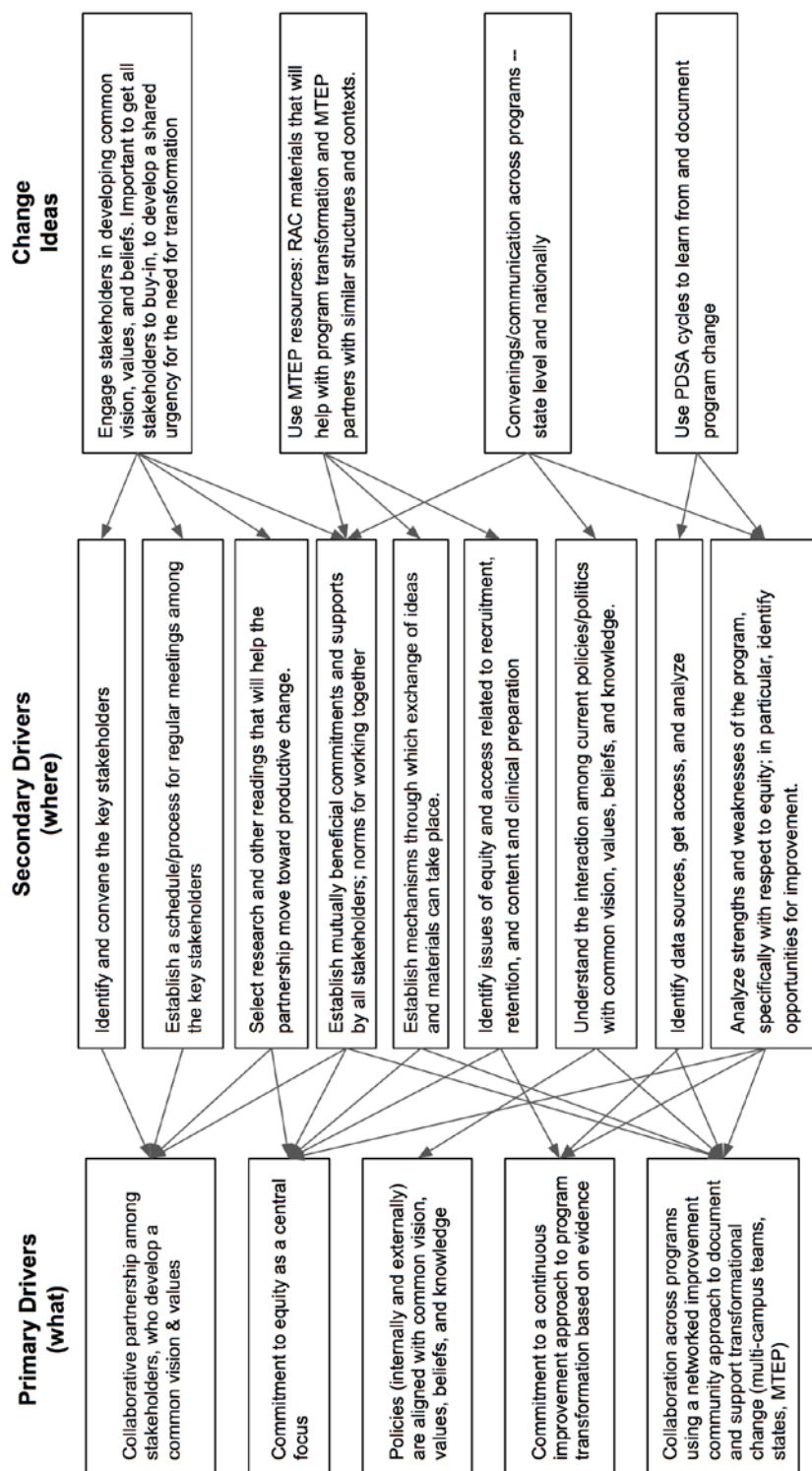

Figure 3. Driver diagram to guide progress toward the aim of program transformation.

Smith, W. M., Lawler, B. R., Bowers, J., & Augustyn, L. (Eds.). (2017). *Proceedings of the sixth annual Mathematics Teacher Education Partnership conference*. Washington, DC: Association of Public and Land-grant Universities.

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Smith, W. M., Lawler, B. R., Bowers, J., & Augustyn, L. (Eds.). (2017). *Proceedings of the sixth annual Mathematics Teacher Education Partnership conference*. Washington, DC: Association of Public and Land-grant Universities.