The Mathematics Teacher Education Partnership (MTE-Partnership) was formed by the Association of Public and Land-grant Universities (APLU) in 2012 to address a major problem in secondary mathematics teacher preparation: a lack of secondary mathematics teachers entering the profession who are well prepared to ensure their students can meet rigorous state mathematics standards for college- and career-readiness, as described in the Common Core State Standards for Mathematics (CCSS-M; Common Core State Standards Initiative, 2010) and other documents. This consortium of more than 90 universities and more than 100 school systems has a common goal of transforming secondary mathematics teacher preparation using the Networked Improvement Community (NIC) design (Bryk et al., 2015). This paper will provide a brief overview of the MTE-Partnership, its evolution over the past several years, and the particular goals for the Seventh Annual Conference held in June 2018.

An Overview of the MTE-Partnership

The initial concept for the Partnership was formed at the APLU’s 2011 Annual Conference of the Science and Mathematics Teaching Imperative, which focused on how higher education might respond to the just-released CCSS-M, including necessary changes in teacher preparation. University programs participate in the Partnership as a part of teams that include K–12 school districts and other partners involved in secondary mathematics teacher preparation, with a requirement that teams engage mathematics teacher educators, mathematicians, and K–12 personnel in their activities. The inclusion of multiple stakeholders in the efforts reflects the focus of the partnership on “develop[ing] and promot[ing] a common vision and goals for how to best prepare teacher candidates who can promote student success in mathematics” within a program, as well as engaging in mutual learning and sharing responsibility across the Partnership (MTE-Partnership, 2014, p. 2). There are currently 40 partnership teams across 31 states in the United States (see Figure 1).

About a year after its formation, the MTE-Partnership adopted the NIC model developed and used by the Carnegie Foundation for the Advancement of Teaching. The planning team had identified several design challenges including (a) the need to maintain the engagement of the teams in the work of the Partnership and (b) the need to maintain a focus on disciplined inquiry consistent with the mission of universities (Martin & Gobstein, 2015). This design supports active collaboration by the partnership teams to address significant issues in secondary mathematics teacher preparation using improvement science to ensure fidelity to academic standards of inquiry. NICs are distinguished by four essential characteristics (Bryk, Gomez, Brunow, & LeMahieu, 2015); each characteristic is described as follows, along with a discussion of how the Partnership continues to address that characteristic.
Focused on a specified common aim: The Partnership is focused on the twin aims of producing mathematics teacher candidates who meet a “gold standard” of preparedness to address the Common Core and of increasing the quantity of well-prepared candidates by Partnership programs by 40% by 2020. Note that the improvement target was set through a collaborative process of collecting data from the individual teams and programs. This characteristic remains central to the success of the Partnership; as emphasized by the authors in the opening remarks to the 2018 Conference, “We will not make progress if we are not aiming in the same direction!” While many solutions might be proposed by members of the Partnership, the aim provides a litmus test of whether those solutions should be pursued.

Guided by a deep understanding of the problem and the system that produces it: Over a period of nearly a year, the membership teams worked together to develop a shared vision for the MTE-Partnership, which is reflected in its Guiding Principles for Secondary Mathematics Teacher Preparation. This document then formed the basis for identifying challenges in secondary mathematics teacher preparation. A multi-step process described by Martin and Strutchens (2014) led to the identification of four significant problem areas of primary importance to the Partnership. In the second column of Figure 2, these problems are restated in the positive as primary drivers, the Partnership’s main areas of influence necessary to promote movement toward achieving the aim (Bryk et al., 2015), which is given in the left-most column. These primary drivers are well-aligned with the Standards for Program Characteristics and Qualities in the Standards for the Preparation of Teachers of Mathematics released by the Association of Mathematics Teacher Educators (AMTE, 2017). Again, as emphasized by the authors in their opening remarks, “You cannot improve what you do not understand”—this process must be ongoing.
Disciplined by the rigor of improvement science: The use of evidence to guide the development of interventions ensures that the changes being proposed are actually improvements. Moreover, Plan-Do-Study-Act (PDSA) cycles (see Figure 3) are used to iteratively prototype, test, and refine interventions; use of PDSA cycles has the potential to lead to timely solutions to important problems (Bryk et al., 2015). Research action clusters (RACs) have been organized to carry out the development of interventions. The current RACs are summarized in the third column of Figure 2. Further discussion of their current work is given in the Research Action Cluster Reports section of the proceedings. Each RAC has developed its own aim statement and driver diagram and undertakes PDSA cycles to guide improvement efforts in alignment with its driver diagram. In some sense, the RACs may be considered sub-NICs. The RACs have continued to refine their aims and driver diagrams as needed over the years. As the authors emphasized in the opening session, based on remarks often made by their colleagues at the Carnegie Foundation, “Not every change is an improvement.” It is all too easy to engage in devising solutions to problems, but without a commitment to evidence-based decision-making, we are unlikely to make progress toward our aim.

Networked to accelerate the development, testing, and refinement of interventions and their effective integration into varied educational contexts: Rather than trying to “control” variation, as typical in traditional educational research, the Partnership’s design embraces variation to study how interventions need to be adapted to respond to the differing conditions under which they are used. As they are tested and refined, interventions can gradually spread across the network, supporting scale up (Bryk et al., 2015). Thus, rather than developing a “treatment” that is tested against a control group, the initial development and testing of an intervention begins in

Figure 2. The MTE-Partnership driver diagram (Martin & Gobstein, 2016).
Figure 3. The Plan-Do-Study-Act (PDSA) Cycle. (Adapted from Langley, Moen, Nolan, Nolan, Norman, & Provost, 2009)

a small number of settings. As its efficacy is demonstrated, it is tested in an increasing number of settings, noting adaptations that are needed due to differences in the context. Eventually, the interventions designed should be useful by teams across the Partnership. The networked organization further allows a “divide and conquer” approach in which subsets of teams can address different problem areas, providing teams access to a wider range of interventions as the work of the RACs progresses. As stated in the opening remarks, “We are stronger together.”

The Role of the Annual Conferences

Over the seven years of the MTE-Partnership, the annual conferences have served as important landmarks where many of those active with the Partnership gather together to reflect on the progress that has been made throughout the past year and set forth plans for the coming year. A brief outline of the previous six conferences follows, following the developmental trajectory of the MTE-Partnership; a more detailed account can be found in the introduction to the Proceedings of the Fifth Annual MTE-Partnership Conference (Martin & Gobstein, 2016).

2012 Conference: The first conference, held in April 2012, focused on creating an initial draft of guiding principles for the MTE-Partnership, which led to the Guiding Principles for Secondary Mathematics Teacher Preparation, since updated in 2014, the central organizing document for the Partnership described previously. A first attempt was also made at identifying central challenges in meeting the guiding principles; follow-up work led to the development of the aforementioned four primary drivers.

2013 Conference: The second conference focused on learning more about the NIC design, which had been adopted following the 2012 conference, and developing the problem space for the Partnership in alignment with that design. Initial concepts were written for a set of 13 RACs, which were later narrowed down to an initial set of five that were launched in the fall following the conference. Teams were invited to join the RACs, and an initial boot camp organized by representatives of the Carnegie Foundation was convened in the fall following the
conference to initiate their work. The Carnegie Foundation played a key advisory role throughout the launch of the
RACs.

2014 Conference: The third conference was focused on the work of the RACs. RAC members met in small
groups to review their initial work in forming an aim and driver diagrams and to begin planning specific
improvement efforts to be undertaken in the coming year using PDSA cycles in which evidence would be gathered
to guide their continued development and refinement. Additional sessions focused on increasing understanding of
the NIC design and exploring issues related to secondary mathematics teacher preparation. The RACs continued
their work throughout the following year.

2015 Conference: The fourth conference continued a primary focus on accelerating the work of the RACs.
A new RAC on improving the retention of program graduates in the profession was also launched, replacing an
earlier RAC. This conference saw the incorporation of all 22 campuses of the California State University system that
offer teacher preparation, greatly increasing the capacity of the MTE-Partnership. The 2015 conference also
introduced an emerging emphasis on program transformation, reflecting the challenges programs face in moving
beyond making changes based on the one or two RACs in which they are actively engaged, to aggregating the
findings of multiple RACs to undertake the broad-scale changes needed to ensure both the necessary quantity and
quality of secondary mathematics teacher candidates.

2016 Conference: The work in the RACs was again the focal point of the 2016 conference. A newly formed
working group on program transformation presented a panel discussion of issues related to transformational
change at the conference and continued its work throughout the following year. In addition, a new focus on equity
and social justice was launched; while these issues are embedded in the Guiding Principles and in the work of
many of the RACs, members of the planning team noted that this is not visibly a part of the Partnership aim or
drivers. A work session was held at the conference to discuss how to make equity and social justice a more explicit
focus of the Partnership. In addition, a series of refereed brief research reports were included in the conference to
enhance the sharing of ongoing work across the partnership. For the first time, Conference Proceedings (Lawler,
Ronau, & Mohr-Schroeder, 2016) were released to provide an accessible record of the work of the Partnership at
the Conference and throughout the past year.

2017 Conference: The overall trajectory of work by the MTE-Partnership continued at the 2017
conference. The work of the RACs was highlighted along the themes of program transformation and equity and
social justice. The theme of program transformation was addressed in a keynote by Jennifer Russell, fellow at the
Carnegie Foundation for the Advancement of Teaching, who discussed the power of networks for program
improvement, and a working dinner organized by the Transformations Working Group. A panel discussion by
Partnership participants addressed various aspects of equity and social justice related to secondary mathematics
teacher preparation; Nicole Joseph, noted scholar on issues of equity, served as a reactant to the panel and to the
conference at its conclusion. A new working group of equity and social justice was launched prior to the
conference, and work sessions were organized by both the Transformations Working Group and the Equity and
Social Justice (ESJ) Working Group. The series of refereed research reports was expanded, again appearing in a

Goals of the 2018 Conference

The Seventh Annual MTE-Partnership Conference had four primary goals to continue progress toward the
Partnership aim, building on the work done in previous years. Each goal is discussed in turn, along with how the
structure of the conference supported that goal.

Partnership/institutional teams will plan next steps in transforming their programs: The importance of better understanding program transformation has been repeatedly emphasized by the planning committee and in surveys of the MTE-Partnership teams. A number of elements of the 2018 conference supported this goal, including a keynote in which Susan Elrod, noted author in the area of institutional change in the science, technology, engineering, and mathematics (STEM) disciplines (cf. Elrod & Kezar, 2016), interacted with Marilyn Strutchens, noted scholar in issues related to equity in mathematics education, on the two conference themes and their interaction. A panel of representatives from five Partnership teams discussed aspects of program transformation Monday morning. The Transformations Working Group organized a discussion session Monday afternoon. A series of posters by the RACs and Working Groups presented in the opening session and available for viewing across the conference provided teams with information on other areas of work that might be of use.

The RACs will continue their work to improve aspects of secondary mathematics teacher preparation, including considering how they share their work in order to contribute to additional teams’ transformational efforts and to the knowledge of the field: This goal is central to the work of the MTE-Partnership, given that the major work of improvement happens within the RACs. The RACs spent more than nine hours working at the conference, central to their goal in progressing toward their respective aims. A special emphasis was placed on how they might begin to disseminate their work, both within the Partnership to support teams’ transformation work and to external audiences. RACs were particularly encouraged to consider how they might organize their ongoing work, given that external funding for face-to-face convenings is coming to an end. Updates on their progress can be found in the Research Action Cluster Reports section of these proceedings.

The Partnership as a whole will grow its sense of joint purpose and identity as a NIC-supporting program transformation: It is critical that the Partnership maintain a sense of common purpose and identity, since participants may tend to focus on the problems that interest them, particularly the work of the RACs in which they are involved (Martin & Gobstein, 2015). While the RACs may be their specific focus for participation, there is much to be gained by emphasizing the broader structure of the Partnership, including learning from and with the other RACs and considering the more general context for the work of the RACs. The project co-directors emphasized the defining characteristics of the Partnership as presented in the previous section, emphasizing the importance of those characteristics for the continuing success of the Partnership. Brief research reports were again included to build understanding of the work going on across the partnership. Finally, conference reactants were asked to consider cross-RAC themes, as well as recommendations for possible new directions MTE-Partnership might pursue in advancing its national profile.

Specific focus on equity and social justice will be included throughout the proceedings: The theme of equity and social justice was threaded throughout the conference. Many members of the ESJ Working Group are also members of the RACs and were charged with helping foreground relevant issues. The Working Group again organized a working session Monday afternoon to discuss how equity and social justice can be better addressed. As discussed previously, one of the speakers for the working dinner specifically addressed equity and social justice, and the reactants were encouraged to include attention to equity and social justice in their remarks.

A new feature was introduced to reflections across the conference, particularly during the plenary sessions: participants were asked to post their thoughts on Padlet. Prompts in the working dinner encouraged them to reflect on the themes of the conference, program transformation and equity and social, and opportunities they identified for making progress. They were also asked to reflect on the panel discussion on program transformation and then identify new opportunities for progress. Reflections on the conference reactants were followed by final additions to opportunities for progress. At the conclusion of the closing session, participants were asked to identify specific actions they would undertake by the end of August and by the end of September.
their posts were anonymous, the intention was that posting their plans might provide a level of accountability in carrying out those plans.

**Final Reflection**

In some sense, the 2018 MTE-Partnership conference consolidated the progress of the past seven years and will serve as a launching pad for the coming years. This conference, along with the preceding six conferences, was found very productive by the participants, as can be clearly seen in the evaluations that have been conducted each year. In thinking across the conference as a whole, participants reported the following for each of the seven annual conferences:

- 94% or more agreed that the conference had clear goals (100% in 2017 and 2018).
- 97% or more agreed that progress was made in achieving conference goals (100% in 2017 and 2018).
- 92% or more agreed that the conference was informative and worthwhile (100% in 2017 and 2018).
- 100% agreed that the interactions with other participants were useful and productive for all seven conferences.
- 94% or more agreed that the conference was a good use of their time (100% in 2017 and 2018).
- 98% or more expressed interest in participating in future MTE-Partnership events (100% in 2017 and 2018).

Many of their concluding remarks, both on the Padlet discussion space organized across the conference and in the subsequent conference evaluation, suggest that the themes of the conference (“Transformation. Equity. Leadership.”) were realized. As the Partnership moves beyond its existing sources of external funding, which have supported its infrastructure over the past years, the commitment and creativity of Partnership participants will be essential in building on the trajectory established over the past seven years.

**References**


