

The Rice University Robert Noyce Master Teaching Fellowship Program (RU-MTF)

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Introduction

Located in the heart of the greater-Houston metropolitan area, Rice University recognizes its responsibility and role to fully engage with the city of Houston and the Houston Independent School District (HISD). The Rice University Robert Noyce Master Teaching Fellowship Program (RU-MTF) is a partnership between the Rice University School Mathematics Project (RUSMP) and HISD to increase the mathematics expertise of secondary teachers. RUSMP identified 16 Master Teaching Fellows (MTF) and in June of 2017 began providing them with focused professional development, leadership development experiences, and salary supplements.

RU-MTF extends RUSMP's prior NSF Mathematics Leadership Institute (MLI) and MLI's Noyce Supplemental Award work, which developed and supported high school teacher leaders. Knowledge about and experience with MLI ensure that all aspects of RU-MTF are designed for maximum impact on mathematics education in the greater-Houston area. RU-MTF expands on MLI's work with high schools to include both middle and high schools.

Over five years (2016-2021) the RU-MTF will deepen the grounding of Master Teaching Fellows (MTFs) in sound mathematical content and research-based pedagogy, leadership, adult education, and mathematics advocacy skills. Reform-based mathematics teaching strategies, a central focus of the RU-MTF, emphasizes problem-solving and motivational strategies, classroom assessment, differentiated instruction, questioning strategies (National Council of Teachers of Mathematics, 2000), and mathematical knowledge for teaching (Hill, Ball, & Schilling, 2008) through sustained professional development that will encompass high-quality instructional methods deemed effective in past research (e.g., Desimone, 2009; Learning Forward, 2011).

By sharing their mathematics content knowledge and pedagogical techniques, MTFs will gain experience in developing meaningful professional learning experiences for teachers at their schools and across the district.

HISD is fortunate to have a racially and ethnically diverse student body, MTFs serve as advocates for equitable mathematics excellence among all students also.

RU-MTF Goal and Objectives

The overarching goal of RU-MTF is to develop exceptional secondary mathematics teachers into leaders who are deeply grounded in sound mathematical content and research-based pedagogical, leadership, adult education, and mathematics advocacy skills. RU-MTF objectives are to develop MTFs who have:

1. a strong knowledge base in both university-level and secondary mathematics and a solid understanding of the connection between the two;
2. a deep understanding of and skills to implement effective precollege mathematics curriculum, instruction, and assessment;
3. exceptional leadership, mentoring, and adult education skills;
4. a robust understanding of equity and diversity issues in STEM, in particular mathematics; and
5. a repertoire of research-based methods for motivating and supporting **all** students to persist and achieve in mathematics with a special focus on motivating URMs.

Evaluation Design

This report concerns the first year of the RU-MTF (Spring, 2017, Summer 2017, and Fall 2017). This report presents: a description of the evaluation design, a description of the first year of the program, an analysis of assessment results thus far, and a discussion of these results.

The purpose of this evaluation was to determine the extent to which the program's goals were met. Accordingly, the guiding questions of the evaluation were:

- To what extent are activities aligned with and sufficient to meet the project's goals and its objectives?
- How do project activities conform to its planned activities and timelines?
- How responsive are project developers to evidence of needs for project adjustments?
- How well does the mechanism work for tracking MTFs' progress?

The 16 MTFs were selected and notified of their acceptance in December 2016. They met for the first time as a group on February 4, 2017. Discussions about their responsibilities as Noyce Fellows, documentation, and compensation took place. Their first task was to draft individual 5-year plans describing the scope of work they propose to complete. These plans were due on May 1, 2017. Sadly, one of the MTFs died unexpectedly during the spring. Permission was given to the PI by the NSF Program Director to not replace this MTF.

Research and evaluation meetings were held with RUSMP administrators to ensure that activities were implemented as planned and when necessary appropriate adjustments were made. In addition, the external evaluator was introduced to the MTFs during the 2017 Spring Networking Conference and observed RU-MTF during its first summer program.

The first summer program for the MTFs took place June 6-9, 12-15, and 19-22. Prior to the summer program, MTF's completed a pre-RU-MTF survey measuring their engagement in leadership activities and diversity dispositions. Assessments of their mathematical knowledge for teaching (content and pedagogical knowledge) were administered on the first day of the 2017 summer program. In addition, 3-5 colleagues and administrators of for each MTF completed a survey in fall 2017 measuring MTFs' teacher leadership attributes as a pre-measure for the RU-MTF program. Pre-test and pre-program survey results will be used to assess changes in teachers' mathematical knowledge for teaching, engagement in leadership activities, understanding of diversity and equity issues in education, and their colleagues' perceptions of MTFs' leadership characteristics.

The report that follows is divided into three sections. The first section presents a description of the summer program components. The second section presents the results of teachers' pre-program survey responses, pre-program mathematics content tests, their colleagues' survey results, and academic-year program components thus far. Finally, the third section presents a discussion of the results.

2017 RU-MTF Description

The first summer program constituted the core of RU-MTF activities for 2017. The summer program was held from June 6-8 and 12-15 at The Rice School/La Escuela Rice, June 9 on the Rice University campus, and June 19-22 in the RUSMP classroom. Classes met from 8:30 a.m. until 3:30 p.m. each day of the

summer program. The program included components on advanced mathematics content, secondary mathematics pedagogy, leadership skills, and diversity and equity issues in STEM.

RUSMP provided each MTF who attended the program with a stipend, classroom materials, and the textbook *Applications of Algebra and Geometry to the Work of Teaching* (2015). To satisfy the requirement of completing the first of two four-hour Rice University graduate courses in Contemporary Topics in Secondary Mathematics, MTFs worked and discussed mathematics problems in both small and large groups under the guidance of PI Dr. Anne Papakonstantinou, RUSMP Director, and Co-PI Dr. Richard Parr, RUSMP Executive Director. MTFs also participated on a mathematics scavenger hunt while on the Rice campus.

During the last week of the first summer program, MTFs also completed two AVID Path Trainings under the direction of Angie Potts, AVID instructional coach. The strands complement the mathematics learned in the Contemporary Topics in Secondary Mathematics and support the program's focus on diversity and equity.

The Mathematics I strand was designed for mathematics teachers new to AVID concepts and methodologies and focused on strategies outlined in AVID's The Write Path I Mathematics Teacher Guide which emphasizes the use of Writing, Inquiry, Collaboration, Organization, and Reading (WICOR) as tools for learning in the mathematics classroom.

The second AVID strand was Culturally Relevant Teaching: Transforming Educators. This strand was designed for experienced teachers ready to work with their colleagues to conduct self-examinations and address issues of race, class, gender, and accountability and provides a framework of effective methodologies that validate the culture of all students in the classroom and on the campus.

During the first summer program, MTFs also participated in presentations from:

- Alyssa Howell, HISD Director of Secondary Mathematics, who shared her vision of mathematics instruction for the district and requested the assistance of MTFs to bring her vision to reality
- Co-PI Dr. Judy Radigan, Director of the Rice University Teacher Education Program, who led RU-MTF through an ice-breaker exercise to improve the relationship between students and teachers and discussed the roles that MTFs can play in the University's work in teacher and principal education.
- Co-PI Professor Richard Tapia, University Professor, Maxfield-Oshman Chair in Engineering, Rice University, who spoke with MTFs on the subject of *Room at the Top: We the Underrepresented Minorities are here; but we are not there*
- Undergraduate and graduate students in STEM from Rice University who spoke about the challenges they had as underrepresented minorities in STEM fields

RU-MTFs' Pre-program Mathematics Content Test Scores and Survey Responses and Colleagues' Ratings of their Leadership Attributes

Of the 15 MTFs in the 2017 summer program, eight were female; three were African American, seven were Anglo, two were Asian, and three were Latino.

Table 1 presents MTFs' ratings of their engagement in leadership activities. The majority of MTFs reported that in the past year, they "rarely" or had "not yet" engaged in the following activities:

- Involved (or served as a member) in professional teacher organizations
- Created partnerships with the community
- Involved in selecting types of professional development for my campus
- Presented/led a workshop/session for colleagues
- Influenced school budgeting
- Led/chaired school committees

Table 1. Survey of AVID Teachers

| In the past 12 months, how often you engaged in the following activities? | | Often | Sometimes | Rarely | Not yet |
|---|---|-------|-----------|--------|---------|
| Involved (or served as a member) in professional teacher organizations | N | 1 | 4 | 4 | 6 |
| | % | 6.67 | 26.67 | 26.67 | 40 |
| Helped develop school policy | N | 2 | 6 | 3 | 4 |
| | % | 13.33 | 40 | 20 | 26.67 |
| Involved in campus level decision-making | N | 4 | 6 | 4 | 1 |
| | % | 26.67 | 40 | 26.67 | 6.67 |
| Planned school improvement | N | 2 | 6 | 3 | 4 |
| | % | 13.33 | 40 | 20 | 26.67 |
| Redesigned instruction based on student assessment | N | 11 | 2 | 1 | 1 |
| | % | 73.33 | 13.33 | 6.67 | 6.67 |
| Shared ideas with colleagues | N | 10 | 5 | 0 | 0 |
| | % | 66.67 | 33.33 | 0.0 | 0.0 |
| Served as a mentor to new teachers | N | 4 | 4 | 3 | 4 |
| | % | 26.67 | 26.67 | 20 | 26.67 |
| Helped make personnel decisions | N | 7 | 1 | 4 | 3 |
| | % | 46.67 | 6.67 | 26.67 | 20 |
| Created partnerships with the community | N | 2 | 4 | 3 | 6 |
| | % | 13.33 | 26.67 | 20 | 40 |
| Involved in selecting types of professional development for my campus | N | 2 | 5 | 4 | 4 |
| | % | 13.33 | 33.33 | 26.67 | 26.67 |
| Presented/led a workshop/session for colleagues | N | 1 | 6 | 1 | 7 |
| | % | 6.67 | 40 | 6.67 | 46.67 |
| Influenced school budgeting | N | 0 | 2 | 7 | 6 |
| | % | 0.0 | 13.33 | 46.67 | 40 |
| Collaborated with peers | N | 12 | 2 | 1 | 0 |
| | % | 80 | 13.33 | 6.67 | 0.0 |
| Led/chaired school committees | N | 3 | 4 | 2 | 6 |
| | % | 20 | 26.67 | 13.33 | 40 |
| Reflected on my own teaching practice | N | 13 | 2 | 0 | 0 |
| | % | 86.67 | 13.33 | 0.0 | 0.0 |
| Initiated school activities | N | 1 | 7 | 5 | 2 |
| | % | 6.67 | 46.67 | 33.33 | 13.33 |

Table 2 presents MTFs’ ratings regarding their knowledge and skills dispositions related to the beliefs, relations, and knowledge of culturally relevant teaching. Less than half of teachers reported that they “strongly agreed” with the following statements:

- Students enter my class with excitement about what the day will bring.
- I continue to reteach my students until they have an understanding of the content.
- I contact my students’ parents/guardians about positive growth.

Table 2. Diversity Disposition Index—Knowledge and Skills

| To what extent do you agree that you use the following educator skills to help your students gain knowledge? | | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|--|---|----------------|-------|----------------------------|----------|-------------------|
| I teach my students the skills to gain knowledge on their own. | N | 11 | 3 | 1 | 0 | 0 |
| | % | 73.33 | 20 | 6.67 | 0.0 | 0.0 |
| I work to develop my students’ critical thinking skills. | N | 11 | 4 | 0 | 0 | 0 |
| | % | 73.33 | 26.67 | 0.0 | 0.0 | 0.0 |
| I am successful at creating meaningful relationships between students' existing knowledge and new information. | N | 10 | 5 | 0 | 0 | 0 |
| | % | 66.67 | 33.33 | 0.0 | 0.0 | 0.0 |
| Students enter my class with excitement about what the day will bring. | N | 4 | 7 | 3 | 0 | 1 |
| | % | 26.67 | 46.67 | 20 | 0.0 | 6.67 |
| I use the teaching “moment” to enhance my students’ understanding of today’s world. | N | 11 | 3 | 0 | 1 | 0 |
| | % | 73.33 | 20 | 0.0 | 6.67 | 0.0 |
| I provide opportunities and structure for my students to work cooperatively. | N | 8 | 6 | 1 | 0 | 0 |
| | % | 53.33 | 40 | 6.67 | 0.0 | 0.0 |
| I possess a large repertoire of teaching strategies to help students access their prior knowledge. | N | 8 | 5 | 1 | 1 | 0 |
| | % | 53.33 | 33.33 | 6.67 | 6.67 | 0.0 |
| I create opportunities for my students to express their knowledge in a variety of ways. | N | 9 | 5 | 1 | 0 | 0 |
| | % | 60 | 33.33 | 6.67 | 0.0 | 0.0 |
| I create opportunities for and encourage my students to share their knowledge and talents with their peers. | N | 8 | 4 | 3 | 0 | 0 |
| | % | 53.33 | 26.67 | 20 | 0.0 | 0.0 |
| I differentiate expectations for individual students. | N | 8 | 7 | 0 | 0 | 0 |
| | % | 53.33 | 46.67 | 0.0 | 0.0 | 0.0 |
| I encourage my students to take responsibility for their own and their peers’ learning. | N | 13 | 2 | 0 | 0 | 0 |
| | % | 86.67 | 13.33 | 0.0 | 0.0 | 0.0 |
| I make an effort to build positive relationships with my students’ parents/guardians. | N | 12 | 2 | 1 | 0 | 0 |
| | % | 80 | 13.33 | 6.67 | 0.0 | 0.0 |

Table 2. Diversity Disposition Index—Knowledge and Skills (cont'd)

| Item | | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|---|---|----------------|-------|----------------------------|----------|-------------------|
| I deliver instruction using an interactive process that enhances further discovery. | N | 8 | 5 | 1 | 1 | 0 |
| | % | 53.33 | 33.33 | 6.67 | 6.67 | 0.0 |
| Many of my lessons require my students to think critically. | N | 9 | 5 | 1 | 0 | 0 |
| | % | 60 | 33.33 | 6.67 | 0.0 | 0.0 |
| I determine where my students are academically and help them reach their potential. | N | 9 | 6 | 0 | 0 | 0 |
| | % | 60 | 40 | 0.0 | 0.0 | 0.0 |
| I help students understand how they are connected to global issues. | N | 8 | 5 | 1 | 1 | 0 |
| | % | 53.33 | 33.33 | 6.67 | 6.67 | 0.0 |
| I continue to reteach my students until they have an understanding of the content. | N | 6 | 8 | 0 | 1 | 0 |
| | % | 40 | 53.33 | 0.0 | 6.67 | 0.0 |
| I contact my students' parents/guardians about positive growth. | N | 3 | 11 | 1 | 0 | 0 |
| | % | 20 | 73.33 | 6.67 | 0.0 | 0.0 |

Table 3 presents MTFs' ratings regarding their beliefs about teaching and learning related to the beliefs, relations, and knowledge of culturally relevant teaching. The majority of teachers reported that they "strongly agreed" with all of the statements.

Table 3. Diversity Disposition Index—Beliefs about Teaching and Learning

| Items | | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|---|---|----------------|-------|----------------------------|----------|-------------------|
| I believe that all students can succeed. | N | 12 | 2 | 1 | 0 | 0 |
| | % | 80 | 13.33 | 6.67 | 0.0 | 0.0 |
| I believe that all students can learn. | N | 13 | 2 | 0 | 0 | 0 |
| | % | 86.67 | 13.33 | 0.0 | 0.0 | 0.0 |
| I believe that students learn in a variety of ways. | N | 15 | 0 | 0 | 0 | 0 |
| | % | 100 | 0.0 | 0.0 | 0.0 | 0.0 |
| I demonstrate enthusiasm for the content I teach. | N | 14 | 1 | 0 | 0 | 0 |
| | % | 93.33 | 6.67 | 0.0 | 0.0 | 0.0 |
| I look for new ways to teach difficult material. | N | 15 | 0 | 0 | 0 | 0 |
| | % | 100 | 0.0 | 0.0 | 0.0 | 0.0 |
| I am enthusiastic about sharing knowledge with my students. | N | 15 | 0 | 0 | 0 | 0 |
| | % | 100 | 0.0 | 0.0 | 0.0 | 0.0 |

Table 3. Diversity Disposition Index—Beliefs about Teaching and Learning (cont'd)

| Items | | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|--|---|----------------|-------|----------------------------|----------|-------------------|
| I collaborate with others in order to learn and grow. | N | 12 | 3 | 0 | 0 | 0 |
| | % | 80 | 20 | 0.0 | 0.0 | 0.0 |
| I am reflective about how my actions affect student achievement. | N | 13 | 2 | 0 | 0 | 0 |
| | % | 86.67 | 13.33 | 0.0 | 0.0 | 0.0 |
| I can express myself creatively as a teacher. | N | 10 | 5 | 0 | 0 | 0 |
| | % | 66.67 | 33.33 | 0.0 | 0.0 | 0.0 |
| I continue to look for new information to share with my students. | N | 14 | 1 | 0 | 0 | 0 |
| | % | 93.33 | 6.67 | 0.0 | 0.0 | 0.0 |
| I learn from my students. | N | 14 | 1 | 0 | 0 | 0 |
| | % | 93.33 | 6.67 | 0.0 | 0.0 | 0.0 |
| I continually search for new knowledge within my content area. | N | 14 | 1 | 0 | 0 | 0 |
| | % | 93.33 | 6.67 | 0.0 | 0.0 | 0.0 |
| I am responsible for creating an atmosphere where all students feel free to openly exchange ideas, thoughts, and opinions. | N | 14 | 1 | 0 | 0 | 0 |
| | % | 93.33 | 6.67 | 0.0 | 0.0 | 0.0 |
| I believe in setting high standards for all students. | N | 12 | 3 | 0 | 0 | 0 |
| | % | 80 | 20 | 0.0 | 0.0 | 0.0 |
| I am passionate about my own learning. | N | 15 | 0 | 0 | 0 | 0 |
| | % | 100 | 0.0 | 0.0 | 0.0 | 0.0 |
| I believe that diversity enhances student knowledge. | N | 13 | 0 | 2 | 0 | 0 |
| | % | 86.67 | 0.0 | 13.33 | 0.0 | 0.0 |

Table 4 presents MTFs' ratings of their community connectedness dispositions related to the beliefs, relations, and knowledge of culturally relevant teaching. Less than half of teachers reported that they "strongly agreed" with the following statements:

- I collaborate on providing community service opportunities for my students.
- I plan instructional opportunities for my students to interact with peers, family members, and the whole community.
- I help my students make connections in their community.
- I am involved in the community where I teach.
- It is important that I attend activities in my students' neighborhoods.
- I work to establish positive school-community relationships.

Table 4. Diversity Disposition Index— Community Connectedness

| Items | | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|---|---|----------------|-------|----------------------------|----------|-------------------|
| I collaborate on providing community service opportunities for my students. | N | 6 | 2 | 5 | 1 | 1 |
| | % | 40 | 13.33 | 33.33 | 6.67 | 6.67 |
| I plan instructional opportunities for my students to interact with peers, family members, and the whole community. | N | 5 | 6 | 2 | 2 | 0 |
| | % | 33.33 | 40 | 13.33 | 13.33 | 0.0 |
| I help my students make connections in their community. | N | 5 | 5 | 3 | 2 | 0 |
| | % | 33.33 | 33.33 | 20 | 13.33 | 0.0 |
| I encourage my students to give back to their community. | N | 9 | 4 | 2 | 0 | 0 |
| | % | 60 | 26.67 | 13.33 | 0.0 | 0.0 |
| I am involved in the community where I teach. | N | 6 | 3 | 3 | 2 | 1 |
| | % | 40 | 20 | 20 | 13.33 | 6.67 |
| It is important that I attend activities in my students' neighborhoods. | N | 5 | 4 | 4 | 2 | 0 |
| | % | 33.33 | 26.67 | 26.67 | 13.33 | 0.0 |
| I see myself as a part of the community in my role as a teacher. | N | 8 | 3 | 2 | 2 | 0 |
| | % | 53.33 | 20 | 13.33 | 13.33 | 0.0 |
| I welcome community members into my classes to share their skills. | N | 8 | 1 | 3 | 3 | 0 |
| | % | 53.33 | 6.67 | 20 | 20 | 0.0 |
| I work to establish positive school-community relationships. | N | 7 | 4 | 3 | 1 | 0 |
| | % | 46.67 | 26.67 | 20 | 6.67 | 0.0 |

Table 5 presents MTFs' mathematical knowledge for teaching (content and pedagogical knowledge) in three content areas: number and operations content knowledge, geometry content knowledge, and patterns, functions, and algebra content knowledge.

Of the 15 MTFs who completed the assessments,

- eight scored below the national average on the number concepts and operations assessment
- two scored below the national average on the geometry assessment
- one scored below the national average on the patterns, functions, and algebra assessment

Table 5. Learning Mathematics for Teaching Assessment Results: z-Score Distributions Presented by Content Area

| Number Concepts and Operations | Geometry | Patterns, Functions and Algebra |
|--------------------------------|----------|---------------------------------|
| 1.96 | 2.25 | 1.58 |
| 1.71 | 2.25 | 1.58 |
| 1.24 | 2.25 | 1.58 |
| 1.02 | 2.25 | 1.12 |
| 0.43 | 2.25 | 1.12 |
| 0.43 | 1.66 | 0.92 |
| 0.24 | 1.14 | 0.92 |
| -0.11 | 1.14 | 0.92 |
| -0.28 | 1.14 | 0.92 |
| -0.28 | 1.14 | 0.56 |
| -0.45 | 0.8 | 0.4 |
| -0.45 | 0.3 | 0.25 |
| -0.79 | 0.09 | 0.25 |
| -1.29 | -0.47 | 0.1 |
| -1.63 | -1.22 | -0.32 |

Tables 6, 7, 8, and 9 present leadership attributes along four dimensions—personal attributes, professional growth and development, classroom environment, and school and district environments. The majority of RU-MTFs’ colleagues and administrators “strongly agreed” that they possessed each of the attributes identified through the survey’s four dimensions.

Table 6. Colleagues and Administrators Perceptions of RU-MTFs’ Personal Attributes

| Items | | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|---|---|----------------|-------|----------------------------|----------|-------------------|
| Has open communication with the principal | N | 30 | 10 | 1 | 1 | 0 |
| | % | 71.43 | 23.81 | 2.38 | 2.38 | 0.0 |
| Is a creative problem solver | N | 30 | 11 | 0 | 1 | 0 |
| | % | 71.43 | 26.19 | 0.0 | 2.38 | 0.0 |
| Is collegial with others on campus | N | 35 | 6 | 0 | 1 | 0 |
| | % | 83.33 | 14.29 | 0.0 | 2.38 | 0.0 |
| Has great organizational skills | N | 29 | 8 | 4 | 1 | 0 |
| | % | 69.05 | 19.05 | 9.52 | 2.38 | 0.0 |
| Has the respect of other teachers on campus | N | 34 | 7 | 0 | 1 | 0 |
| | % | 80.95 | 16.67 | 0.0 | 2.38 | 0.0 |

Table 7. Colleagues and Administrators Perceptions of RU-MTFs’ Professional Growth and Development

| Items | | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|---|---|----------------|-------|----------------------------|----------|-------------------|
| Grows and develops professionally | N | 34 | 7 | 0 | 1 | 0 |
| | % | 80.95 | 16.67 | 0.0 | 2.38 | 0.0 |
| Provides mentorship for other teachers | N | 28 | 11 | 2 | 1 | 0 |
| | % | 66.67 | 26.19 | 4.76 | 2.38 | 0.0 |
| Aspires to continue his/her education in leadership | N | 33 | 5 | 4 | 0 | 0 |
| | % | 78.57 | 11.9 | 9.52 | 0.0 | 0.0 |
| Is proficient with and uses technology | N | 33 | 8 | 0 | 1 | 0 |
| | % | 78.57 | 19.05 | 0.0 | 2.38 | 0.0 |
| Assists/develops professional development programs | N | 23 | 13 | 3 | 2 | 1 |
| | % | 54.76 | 30.95 | 7.14 | 4.76 | 2.38 |

Table 8. Colleagues and Administrators Perceptions of RU-MTFs' School and District Environment

| Items | | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|--|---|----------------|-------|----------------------------|----------|-------------------|
| Promotes high standards for all students | N | 37 | 4 | 1 | 0 | 0 |
| | % | 88.1 | 9.52 | 2.38 | 0.0 | 0.0 |
| Sees connection between instruction and assessment | N | 38 | 3 | 1 | 0 | 0 |
| | % | 90.48 | 7.14 | 2.38 | 0.0 | 0.0 |
| Is effective at classroom management and discipline | N | 30 | 8 | 3 | 1 | 0 |
| | % | 71.43 | 19.05 | 7.14 | 2.38 | 0.0 |
| Uses a variety of instructional methods | N | 32 | 8 | 1 | 0 | 1 |
| | % | 76.19 | 19.05 | 2.38 | 0.0 | 2.38 |
| Creates equitable learning opportunities for diversity | N | 33 | 7 | 1 | 0 | 1 |
| | % | 78.57 | 16.67 | 2.38 | 0.0 | 2.38 |

Table 9. Colleagues and Administrators Perceptions of RU-MTFs' Classroom Environment

| Items | | Strongly agree | Agree | Neither agree nor disagree | Disagree | Strongly disagree |
|--|---|----------------|-------|----------------------------|----------|-------------------|
| Encourages fellow teachers to do their best. | N | 31 | 8 | 2 | 1 | 0 |
| | % | 73.81 | 19.05 | 4.76 | 2.38 | 0.0 |
| Has chaired committees or a department on campus | N | 26 | 8 | 5 | 2 | 1 |
| | % | 61.9 | 19.05 | 11.9 | 4.76 | 2.38 |
| Has served in leadership roles on campus | N | 28 | 7 | 5 | 2 | 0 |
| | % | 66.67 | 16.67 | 11.9 | 4.76 | 0.0 |
| Helps principal promote a focus on teaching/learning | N | 23 | 14 | 1 | 4 | 0 |
| | % | 54.76 | 33.33 | 2.38 | 9.52 | 0.0 |
| Is committed to shared decision making | N | 32 | 6 | 4 | 0 | 0 |
| | % | 76.19 | 14.29 | 9.52 | 0.0 | 0.0 |

Academic Year Follow-up Activities

Academic-year follow-up activities included the RUSMP Fall Networking Conference held on September 16, 2017 at Rice University in Sewell Hall. During the meeting, MTFs discussed using the TI Smart View, use of Google Drive to document their work, using Twitter and Facebook to promote their mathematics activities, and opportunities to present their work and develop leadership skills by submitting a proposal for the CAMT Conference in July 2018. They also heard a colloquium talk *Put on Your Math Goggles®: Integrating Mathematics and the Visual Arts*, by Dr. Robin A. Ward, RUSMP Director of Curriculum Integration.

Each MTF maintains an on-line portfolio that documents all MTF coursework and leadership experiences including detailed documentation related to activities each develops, enacts and participates in during the school year. This includes field and reflection notes associated with daily MTF activities and products. Examples of the personalized leadership experiences included in MTFs' on-line portfolios as of November 2017 are presented below.

Lead study groups or seminars with teachers about mathematics concepts or instructional strategies as well as seminars for new AVID teachers on how to incorporate AVID teaching strategies in the classroom

- *My presentation of a program for graphing and analyzing trigonometric functions in Desmos to the math team and discussions of possible applications in precalculus and calculus.*
- *Discuss[ed] actions and strategies [with principal, assistant principal, and math teachers] to better prepare students for the PSAT test in order to increase their scores. Based on data, group students, and provide Saturday tutorials with analysis of the common mistakes and discuss strategies for solving problems. Planned Saturday Tutorials: 9/30/17 and 10/6/17*
- *Discussions [with Juniors PLC meeting, assistant principal, and teachers about] increasing student talk in classroom: peer discussions in teams, the ratio of teacher and student talk. Based on Universal screening results make the emphasis on low lexile reading level students to help them better comprehend word problems..*

Work with students, teachers, mathematics department chairs, school administrators, and guidance counselors to: enhance students' self-efficacy for and interest in mathematics, increase students' likelihood of taking advanced mathematics courses, and promote higher mathematics achievement for all students

- *I sponsor the math club. In the future, this will mean preparing for competitions. For now it has been my supervising a senior student as she teaches the rest of the club some elementary abstract algebra that she learned at summer math camp. She's pretty good at it, and she's certainly enthusiastic!*
- *Took 24 9th grade Engineering Students to Stem Showdown Competition at the University of Houston*

Observe classes of mathematics teachers to offer feedback and suggestions on improving instruction;

- *[Discussed] classroom observations [with Juniors PLC meeting, assistant principal, and teachers] to reflect in our practice and learn from each other. [Next steps,] implementation of successful techniques used by peer teachers.*
- *Mentor for new teacher*

Participate in planning school or district mathematics initiatives as well as develop curriculum and writing assessment items;

- *Developed Online AQR A and B Course to help those students who failed in AQR class*

- *Continued modifying [Algebra 2] unit calendars to adjust for changes from last year and to adjust for snapshot assessments. Developed the first few weeks of lessons and plans*

Interact with parents and their school communities.

- *Contacted parents [about] their children needing to be placed in Pre-AP sections.*

Concerns expressed in MTFs' reflections about the 2017 Fall Semester are presented below.

- *With class sizes between 35-41, and most composed of almost entirely ESL students, a lot of what I wanted to try this school year has been hard to implement. My room can barely hold the number of students I have, which makes some of the activities I want to do difficult, and with so many kids that lack formal education it is hard to manage them in out of classroom environments. I have been applying some of the ideas I had from the summer, and I'm really emphasizing clarifying misconceptions, and focusing on student deficiencies. The Universal Screening tool that HISD is using this year is very helpful in identifying some of these deficiencies. With many of my students scoring at the 1st-5th grade levels, it is no surprise they are struggling in Alg 2.*
- *Curriculum is very wide for one year of study. In average, students of the age 14-15 years old are not comfortable and are not able to comprehend such amount of information. There are several options to cover (formally) all topics of the curriculum a) skip some topics; b) teach/learn topics on the very basic level as definitions and one step problems; c) substitute problems by hands on activities... Teachers are urgently required to teach/develop higher level content rather than basics facts and knowledge. Higher level thinking cannot be obtained without the concrete knowledge. Many problems in benchmark tests are questions regarding the vocabulary with negations, converse, and contrapositive statements. Such questions imply a fluency in application of methods and certain knowledge.*
- *Each year I have tried to make it very clear to my students that my goal is for them to learn—how we get to that goal is not necessarily determined beforehand, and since it is their education, they should certainly have some say in how they get there. This of course doesn't work for everyone, but it establishes a relationship that I certainly feel more comfortable with. I don't want to be a taskmaster, demanding compliance from my students. On the contrary, I generally feel that anyone can comply, but only some people genuinely think because they want to. I try to encourage my students to want to. And I believe the way to do that is by modeling and encouraging curiosity.*

Discussion

This report represents the baseline performance of MTFs and will provide the basis for future comparisons. The current RU-MTF activities appear to be both aligned with and sufficient to meet the project's goal and objectives. RU-MTF activities conform to the planned activities and timelines outlined in the proposal. RUSMP administrators make appropriate project adjustments as needed. Data collection methods—assessments, observations, portfolio reviews, and surveys—promote the timely tracking of MTFs' progress.

Survey results indicate that a majority of MTFs' identified six leadership activities in which they had "rarely" or "not yet" engaged; suggesting this as a potential area for high levels of MTFs growth. The assessment results indicate that the future development of the MTFs needs to focus on building their sense of community connectedness and a few areas related to their knowledge and skills of the diversity dispositions. Given that over half of MTFs scored below average on the number concepts and operations domain of the *Learning Mathematics for Teaching* assessment, this will likely be the area in which the greatest improvements in their mathematical knowledge for teaching will be observed. Finally, MTFs were well regarded by their colleagues and administrators. This may bode well for MTFs as they work to assume greater leadership responsibilities on their campuses.

The MTFs' efforts to improve mathematics teaching and learning on their campuses was evident from their on-line portfolio entries. However, their reflections also pointed out the challenges they encounter as they work to improve their professional learning communities and nurture students' curiosity about mathematics.

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