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Evaluation of Project Math Identity Leadership Accelerator

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Executive Summary

As part of a Supporting Effective Educator Development (SEED) grant, the Human Resources Research Organization (HumRRO) partnered with UnboundEd to conduct an evaluation of its Math Identity Leadership Accelerator (MILA) Program. The grant period was from October 2020 through September 2023.

MILA Program

UnboundEd designed the MILA program to shift school leaders' mindsets to (a) acknowledge that systemic racism exists, systemic racism has an impact on math instruction, and that culturally responsive instruction (CRI) is a lever to improve math instruction; and (b) recognize how improved math instruction chips away at systemic racism. The MILA program trains school leaders to better understand math problem-solving and culturally responsive teaching self-efficacy, while enhancing math professional learning communities (PLCs). Through the MILA program, school leaders build an understanding of culturally responsive math practice and capacity to use school structures that promote culturally responsive math instruction. When the school leaders implement the structural changes necessary to improve culturally responsive math instruction, the math teachers increase their awareness and understanding of how to cultivate students' mathematical thinking that facilitates them creating more culturally math-responsive classrooms. This, in turn, helps students develop a more positive math identity, enhances their sense of belonging, and ultimately improves their math proficiency.

The MILA program relies heavily on coaches—MILA Facilitator Coaches (MFCs)—to support and guide the participating school leaders. Each MFC works with a small group of designated participants throughout their tenure in the program, often through coaching sessions. The sessions that MFCs hold with their participants are designed to facilitate further interpretation, explanation, and clarification of key points highlighted during program sessions.

MILA Evaluation Study

As the external evaluator, HumRRO conducted a formative evaluation throughout the grant period to provide timely feedback to inform continuous program improvement. In addition, HumRRO conducted a summative evaluation during Year 2 of the grant. The summative evaluation framed a delayed treatment randomized control trial (RCT) impact study with two cohorts of school leaders who were randomly selected to the cohorts using a block design. Cohort 1 (C1) was comprised of school leaders from 65 schools across 10 districts and nine states who participated in the MILA program from April 2021 through June 2022. Some of these 65 schools, including an entire district, participated in the program but were excluded from the impact study. Cohort 2 (C2) was comprised of school leaders from 75 schools across 11 districts who participated in the MILA program from April 2022 through June 2023. The RCT investigated the extent to which participating in the MILA program resulted in changes in school leaders' and educators' beliefs and practices about CRI, which, in turn, changed teachers' beliefs and practices about CRI. In addition to focusing on the effectiveness of the MILA program goals, the RCT also examined the extent to which student math achievement improved. The RCT was designed to achieve a What Works Clearinghouse (WWC) rating of *Meets Design Standards Without Reservations* (WWC, 2022).

Research Questions

The MILA evaluation study addressed the following six major research questions:

- RQ1: To what extent do school leaders who participate in the MILA program demonstrate high quality leadership that is culturally responsive?
- RQ2: To what extent do math teachers whose school leaders participate in the MILA program demonstrate high quality math instruction that is culturally responsive?
- RQ3: To what extent does math achievement of students whose school leaders participate in the MILA program improve?
- RQ4: To what extent do students of the math teachers whose school leaders participate in the MILA program perceive they receive school support?
- RQ5: To what extent do students of the math teachers whose school leaders participate in the MILA program feel they belong?
- RQ6: To what extent is the MILA program implemented with fidelity across school leaders?

Formative Evaluation

The purpose of the formative evaluation was to provide feedback on program performance, implementation, and perceived effectiveness to inform continuous improvement. We gathered formative data regarding the MILA program via surveys that we administered to program participants and focus groups that we conducted with participating principals and MFCs. Analyses of the formative data revealed findings across four key themes: (a) implementation of key concepts and structures, (b) participation and engagement, (c) MILA experiences, and (d) changes in attitudes and behaviors.

Implementation of Key Concepts and Structures

Several principals reported that key MILA concepts and structures helped them identify potential barriers in their school's policies and practices regarding culturally responsive math instruction. They found discussing strategies for how to implement culturally relevant instructional practices and culturally relevant learning to be helpful. They also found value in a discussion about why the implementation of these practices may differ from classroom to classroom. Several participants noted use of the modified Culturally Responsive Instruction Observation Protocol (CRIOP-M) and the opportunity to network were beneficial aspects of the MILA program. In addition, while participants saw the value of having school structures in place to promote CRI, they reported difficulty in creating and implementing effective CRI structures within their schools. Several principals noted their districts lacked the resources or policies for them to successfully implement the structures. Participants generally indicated they had begun to apply key MILA content in various important ways at their schools; however, there was skepticism from some principals about program sustainability within their schools.

Overall, while many participants engaged in various program activities (e.g., coaching sessions, synchronous learning experiences), MFCs reported that school leaders found it challenging to implement key MILA concepts within their school buildings. Some noted that without structured support and resources from the district, successful school-level implementation was challenging. Further, although the decision to participate in MILA was made at the district level,

the MFCs reported principals' implementation of MILA principles was especially challenging because there were no individual- or school-related consequences if the principal did not complete the assigned program activities.

Participation and Engagement

While there were more participants who participated in some activities, few participants fully participated in all MILA program activities. Participants indicated the amount of work to participate in MILA was quite high and completing the work in a timely manner was difficult due to their schedules. Regardless of the length of time they had participated, most participants perceived the effort required to participate in the MILA program was much more than they expected. Of the participants who provided feedback, all reported experiencing challenges to be as involved and engaged as they would have liked and cited time constraints as the primary reason. While there was agreement about experiencing challenges to participate, the principals communicated that they appreciated the flexibility they were given and felt that their MFCs never judged them.

The MFCs echoed the varying levels of principal participation and engagement, which differed by individuals and districts. Some MFCs reported some lingering effects of the schools' COVID-19 lockdowns that prevented the principals' full MILA participation. This was especially true for the C1 principals who completed the MILA program during the 2021–22 school year. The MFCs also mentioned that numerous participants wanted to do well in the program but had difficulty doing so because of the participating principals' school responsibilities. The MFCs reported that frequent communication helped them provide suggestions to the principals about prioritizing their MILA work when they fell behind. Several MFCs perceived that most of their assigned participants believed the MILA program was valuable given the participants' excitement during the coaching sessions.

MILA Experiences

Overall, participants' perceptions were generally positive regarding their MILA learning experiences as they progressed through the program. Many participants expressed positive regard for their coaches, with the coaching sessions and support from the coach reported to be the most valuable aspects of the program for providing them with information and skills they could share or use to support their math teachers' use of CRI. The principals indicated the sessions on culturally responsive teaching were especially interesting and helpful, as well as the sessions related to (a) providing opportunities for students to establish voice, choice, and trust with their teachers to meet their cultural and brain-based needs; (b) the concept of community versus individuality in culture and ways to embed community into the math classroom; and (c) recognizing dominant culture in the classroom. The challenges that the principals experienced were mixed across cohorts. For example, some C1 principals sang praises for the learning management system (LMS), Canvas, used, noting how materials and assignments were easily accessible, while other principals had difficulty using Canvas throughout their participation in MILA, with some noting being unable to access or track their assignment completion. Some C2 principals reported the platform was user-friendly and feedback was prompt, but they often encountered problems with the platform not recording their completion of assignments and that reading assignments were not specified in the platform.

Changes in Attitudes and Behaviors

Principals' feedback was generally positive about how the MILA program changed the way they support their math teachers. Some principals reported their MILA participation changed how they support teacher PLCs within their school, including guiding conversations during the PLC sessions. Principals reported they continued to learn how to optimally use the CRIOP-M when conducting classroom observations and providing subsequent feedback. They also commented on the extent to which they observed changes in their math teachers' attitudes or behaviors regarding problem-solving strategies and math instruction. Changes varied from teacher to teacher, with some instructors being less flexible and more resistant to change than others. Regarding changes in their attitudes and behaviors, principals reported the MILA program helped them be more mindful of the outcomes that can and do occur because of their decision-making. They also stated the MILA program helped them be more thoughtful about how they lead their team and create multiple opportunities for students to access math and learn math skills.

The MFCs noted various changes in the principals' attitudes and behaviors based on their MILA participation. Several MFCs commented that the lack of participant buy-in made it challenging for them to observe any change in participants' attitudes and behaviors. Some MFCs reported having observed an increase in their participants' level of knowledge about MILA program topics, which allowed them to have more informed conversations with the participants about CRI.

Summative Evaluation

HumRRO conducted a summative evaluation of the MILA program during the 2021–2022 school year (i.e., grant Year 2) to gather data regarding specific CRI strategies implemented at the school level as well as the types of structures present within the school that support coaching for CRI. The summative evaluation included the 65 C1 participants and focused on gathering data about the (a) specific CRI strategies implemented at their school and (b) types of structures present that support coaching for CRI. The instruments used to gather summative evaluation data included the MILA Coaching Rubric, the CRIOP-M, and the MILA School Structures Rubric.

MILA program staff developed the MILA Coaching Rubric to help school leaders reflect on their own coaching skills and behaviors and the state of coaching in their schools so they can improve coaching through new or altered systems. MILA program staff modified the Culturally Responsive Instruction Observation Protocol (CRIOP-M) for MILA participants to use when conducting classroom observations of their middle school math teachers. MILA program staff developed the MILA School Structures Rubric to support school leaders in identifying and implementing structures within their schools that support coaching for and access to culturally responsive math instruction.

MILA Coaching Rubric

School leaders from 20 schools (31%) conducted observations and provided both baseline and outcome MILA Coaching Rubric scores for at least one of the school's middle school math teachers. Based on a paired sample t-test comparing mean scale scores, there were significant differences for each MILA Coaching Rubric domain between the mean baseline and the mean outcome scores. For each domain, the mean MILA Coaching Rubric outcome score improved over the mean MILA Coaching Rubric baseline score.

CRIOP-M

School leaders from 28 schools (43%) provided CRIOP-M scores for at least one of their middle school math teachers at one or both observation time periods (i.e., baseline and outcome). Each CRIOP-M pillar mean score increased from the baseline to the outcome period. The overall means increased from baseline to outcome; however, when examining the paired mean differences between the two periods, the mean differences between the baseline and outcome paired scores were not statistically significant and the paired mean score for each CRIOP-M pillar decreased from baseline to outcome. This may be a result of the small sample of participants ($n = 11$) who had both baseline and outcome CRIOP-M scores.

MILA School Structures Rubric

School leaders from 22 schools (34%) provided MILA School Structures Rubric scores for both baseline and outcome time periods. Based on a paired sample t-test, there were significant differences between the mean baseline and the mean outcome scores for the Scheduling and Rostering and the Coaching Structures domains. The mean outcome scores for these two domains were significantly higher compared with their corresponding mean baseline scores. While the mean Master Scheduling outcome score increased, it was not significantly higher than the mean baseline score.

High Performing MILA Schools

We used performance on the MILA Coaching Rubric, CRIOP-M, and MILA School Structures Rubric to identify high performing MILA schools. A total of 11 schools were designated as high performing based on their MILA Coaching Rubric scores, 30 schools were designated as high performing based on their CRIOP-M scores, and 15 schools were designated as high performing based on their MILA School Structures Rubric scores.

Impact Evaluation

The impact evaluation involved a randomized control trial (RCT) designed to (a) gather perception data from participating principals, their middle school math teachers, and a sample of the teachers' students; and (b) examine student math achievement in the participating schools. We developed surveys to gather impact data from each of the three RCT stakeholders (i.e., principals, teachers, and students). These surveys were based on literature and best practice, with questions used or adapted from a scan of existing instruments that measures the same constructs.

A total of 96 schools participated in the RCT and involved a delayed treatment; C1 schools participated in the MILA program during the 2021–2022 school year (RCT) and C2 schools participated in the MILA program during the 2022–2023 school year (i.e., after the RCT concluded). In addition to the 96 principals who participated in the RCT, we identified 473 grade 6–8 math teachers and 35,528 students enrolled in grade 6–8 math classes.

Principal Outcomes

Based on an analysis of the principals' responses to the surveys administered at baseline and outcome time periods, the observed means for those who participated in MILA were higher than those who did not participate in MILA; however, only the findings from the modified Culturally Responsive Teaching Practice (CRTP-M) were statistically significant. This means that, after

accounting for the baseline scale mean and other demographic characteristics, there were no meaningful differences on the other three principal outcomes (modified Mathematical Problem-Solving Strategies [MPSS-M], modified Just-in-Time Coaching [JITC-M], and modified Culturally Responsive Leadership Efficacy [CRLE-M]) between principals who participated in MILA and those who did not participate. The small sample may have reduced the power to detect meaningful differences. While many participants completed the survey at baseline, participation was reduced significantly over the program's 15 months, such that only 35 participants completed the survey at both the baseline and the outcome time periods.

Teacher Outcomes

Despite finding no statistically significant impact on teachers' responses to the modified Culturally Responsive Teaching Self-Efficacy (CRTSE-M) or the MPSS-M (after accounting for the baseline scale means), the adjusted MPSS-M mean difference for teachers was positive, potentially suggesting that the teachers of school leaders who participated in the MILA program demonstrated more awareness and a better understanding of math problem-solving strategies than the teachers whose school leaders did not participate in MILA. However, the adjusted CRTSE-M mean difference for teachers was negative, potentially suggesting that the teachers whose school leaders participated in MILA displayed less culturally responsive teaching self-efficacy than the teachers whose school leaders did not participate in MILA. The small analytic sample resulting from the study's high attrition rates may have reduced the power to detect meaningful differences.

Student Noncognitive Outcomes

Findings from students' responses to the noncognitive survey suggest that MILA had a positive impact on students' mathematical identity (modified Mathematical Identity [MI-M]). The treatment group had statistically significant higher scores for MI-M, suggesting the principals' participation in MILA positively impacted students' own identity as well as the perceptions others' have of them as math learners. In contrast, there was no statistically significant impact on students' perceptions of their math teachers' culturally responsive teaching practices (modified Student Measures of Culturally Responsive Teaching [SMCRT-M]) or their own sense of school belonging (modified Psychological Sense of School Membership [PSSM-M]). However, the adjusted student mean differences for SMCRT-M and PSSM-M were positive, possibly suggesting that the students whose school leaders participated in MILA perceived their teachers' math instruction was more culturally responsive and the students themselves had a stronger sense of belonging than the students whose school leaders did not participate in MILA.

Student Math Achievement

Based on analyses of student state math achievement data, findings suggest that MILA had no observed impact on students' math achievement.

Discussion

Initial implementation of the MILA program and completion of this study occurred during a time of national turmoil. The World Health Organization (WHO) declared the novel coronavirus (COVID-19) outbreak a global pandemic in March 2020, approximately 6 months before the MILA study began. As the pandemic continued, most public schools began the 2020–2021 school year via virtual classrooms, with some switching to a hybrid situation of virtual and in-

person classroom instruction in January 2021. More, but not all public schools, returned to in-person classroom instruction for the 2021–2022 school year. The first cohort of school leaders began their MILA participation in April 2021 and finished the program in June 2022, having had to contend with the pandemic for more than an entire school year.

The nation also experienced a series of race-related incidents, tragedies, and protests during this time, including the murders of Ahmaud Arbery in February 2020, Breonna Taylor in March 2020, George Floyd in May 2020, and Daunte Wright in April 2021. These and other incidents, such as increased violence against Asians and the Black Lives Matter marches, highlighted injustices and inequities targeted at minorities, sparking renewed dialogue on racism in America.

The backdrop described above is especially important as a key goal of the MILA program is for school personnel to collaborate in taking anti-racist actions to rectify systemic inequities as they occur in middle school math instruction. Within this context, we highlight the following themes based on the formative, summative, and impact evaluation results.

MILA Participation Was Limited

School leaders overwhelmingly indicated their MILA participation was limited. Additionally, virtually all participating school leaders perceived the effort required to participate in MILA was much more than expected. Although several reasons were given, most indicated their responsibility as school principal was the primary reason for their limited participation. While principals' responsibilities are many, we recognize the pandemic likely created even more tasks and duties than they would likely have faced during a typical school year. It is reasonable that having to constantly be alert and react to the dynamic challenges of the pandemic and the additional burden of ensuring the safety of their students left school leaders with little time and focus for participating in MILA.

Coaching Was Most Valuable Aspect of MILA

Participating school leaders consistently reported that the support they received from their coaches was the most valuable aspect of MILA. Based on the school leaders' feedback, the coaching support they received was two-pronged: (a) support in prioritizing MILA content and assignments and (b) guidance and instruction from the coaches to help school leaders understand or apply MILA principles and practices. Based on the results of the MILA Coaching Rubric, participating school leaders improved in their ability to focus on how teachers could increase their students' math understanding, identify the cause of students' lack of understanding or misunderstanding, and provide actionable steps for improvement. Similarly, coaches' ratings on the Coaching Structures domain showed that the participating school leaders improved throughout the school year in their ability to routinely collect information about their math teachers' instructional practices and then use that information to target coaching needs for teacher improvement. The MILA program appears to engage individuals who are successful in applying various effective coaching techniques and, in turn, these techniques are perceived to be valuable by the participants.

MILA Participation Impacted Willingness to Prioritize Efforts to Improve CRI

Overall, participating school leaders indicated more positive beliefs toward math problem-solving strategies, coaching, CRI, and culturally responsive leadership self-efficacy than non-participants. Of these CRI-related constructs, however, only the participating school leaders'

beliefs about culturally responsive teaching practices were significantly different from those of the non-participants. This finding indicates that participation positively influenced the school leaders' inclinations to accept and implement many of the principles and practices espoused by the MILA program, most especially their willingness to prioritize efforts to improve math CRI and problem-solving strategies. This finding is important as key goals of MILA are (a) for school leaders to acknowledge that racism has an impact on math instruction, with CRI serving as a lever to improve math instruction, and (b) to train school leaders to better understand math problem-solving and how it cultivates students' mathematical thinking.

MILA Participation Had No Impact on Teachers' CRI

Regardless of whether their principal participated in MILA or not, there were no differences in the math teachers' CRI self-efficacy or their understanding and awareness of math problem-solving strategies from the beginning to the end of the 2021–2022 school year. Given MILA was intended to directly impact the attitudes and behaviors of school leaders, with secondary or indirect impacts on teachers, it is reasonable that it may take longer than a single school year for participation in MILA to impact the behaviors and instruction of the math teachers.

MILA Participation Had Mixed Impact on Students' Noncognitive Outcomes

Based on their survey responses, changes in the students' perceptions about their teachers' CRI practices, math identity, and school belonging were mixed. Specifically, the perceptions of the students whose principals participated in MILA were significantly higher regarding their math identity than those whose principals did not participate in MILA. This finding is important because students' math identity—how a student thinks of themselves as a math learner as well as their beliefs about whether others perceive them positively as a math learner—impacts their math engagement, which in turn, impacts their math achievement. In contrast, there was no difference between the two groups of students regarding their perceptions of teachers' CRI practices and the students' sense of school belonging, suggesting school leaders' MILA participation had no impact on these two student noncognitive outcomes. Given they were indirect recipients of MILA program benefits, it is also reasonable that more than a single school year is needed to produce changes in students' perceptions.

MILA Participation Had No Impact on Students' Math Achievement

The ultimate goal of MILA was to train school leaders to better understand and implement math problem-solving and culturally responsive teaching strategies within their schools to increase students' math achievement. Our analyses of the students' spring 2022 math scores provided no evidence that school leaders' MILA participation increased students' math achievement. The MILA logic model presents student achievement as a long-term outcome of the program, so it may take 3–5 years before seeing impacts in students' math achievement.

Recommendations

The concepts underlying the MILA program are important and have the potential to positively change students' perceptions about math and how they are supported specifically by their teachers and generally by their school. If such changes can occur, students' math achievement could improve, resulting in major and meaningful changes. Based on study findings, we offer the following recommendations for how the MILA program may be improved:

- 1. Reduce the overall length of the program.** The program requires a minimum of 27.5 hours of activities and assignments to be completed across 15 months; however, it would take participants 321.25 hours if they completed all activities and assignments across the program's four units. Participating school leaders voiced strong opinions that the MILA program was too lengthy, and expectations were unreasonable for completing all activities and assignments. We suggest that program staff review MILA schedule and content to consider how the program can be streamlined.
- 2. Restructure the program for delivery of stand-alone modules.** MILA consists of four units of program lessons, with the units presented consecutively such that content builds on that presented in previous units. Based on feedback from the participating school leaders and MILA coaches, some participants became disengaged at times because they had already received training or professional development on various topics covered by MILA. A current best practice trend is to integrate micro-credentials⁹ into professional development. If appropriate, micro-credentials can be stackable such that they provide a pathway to a certificate. We encourage MILA program staff to consider delivering the program units as stand-alone professional development modules or offering the units as micro-credentials to allow participants flexibility and personalized decision-making concerning professional learning to address any skill gaps.
- 3. Offer more in-person sessions.** MILA was conducted entirely as a virtual program because of the ongoing pandemic. Participating school leaders stated (and MILA coaches confirmed) that they would have been more engaged and accountable for completing the program had there been more in-person sessions. They proffered the belief that they would have been more accountable and, thus, more involved and engaged in the program had meetings and discussions been conducted in person rather than virtually. We encourage staff to consider the various topics covered across the MILA program and identify those for which an in-person session could increase participant engagement and completion.
- 4. Integrate some sort of coaching aspect into virtually every lesson.** A key theme gleaned from the MILA program evaluation is that participating school leaders perceived the coaching sessions and support they received from their coaches as the most valuable aspect of MILA. This feedback was borne out from the MILA coaches' ratings, which showed improvement in the school leaders' ability to focus on how their teachers could increase their students' math understanding, identify the underlying cause of the lack of understanding or misunderstanding, and target actionable steps to help the students improve. The MILA coaches' ratings also showed that the school leaders improved their capacity to routinely observe the instructional practices of their math teachers and use the observational information to help the teachers build more effective CRI classrooms. Given the successful role it played, we encourage MILA program staff to find even more ways to incorporate coaching into the program.