

YEAR III *Evaluation Report:*
MSPinNYC2

Prepared by¹
Howard T. Everson
Shulamith Freedman
Cayla McLean
Laura Saxman
Ally Stevens

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¹ Names are in alphabetical order.

Executive Summary

I. Introduction

The *Math Science Partnership in New York City 2 (MSPinNYC2)* is a multi-year, National Science Foundation (NSF) funded initiative with the aim of transforming teaching and learning in urban secondary schools' STEM classrooms by focusing on teacher preparation and pedagogical strategies based on the *Peer Enabled Restructured Classroom (PERC)* instructional model. At its core, the PERC model uses a student-centered classroom approach in which Teaching Assistant Scholars (TAS)—in concert with the teacher—facilitate learning in small groups of math and science students. In this unique and innovative Project, the term “student” represents two distinct groups— the Teaching Assistant Scholars (or TAS) and the students enrolled in the PERC classes (referred to as PERC students). The TAS are high school students typically no more than one grade level ahead of the students enrolled in the PERC classes. Eligibility for a TAS position requires students to have completed the course for which they assist and to have passed the related Regents end-of-course examination. To complement and strengthen their work as teaching assistants, the TAS attend classes (referred to as TAS classes) designed to deepen their knowledge of the mathematics or science content area in which they assist and to develop their pedagogical skills in the PERC classrooms.

II. Evaluation Questions and Methodology

Our evaluation used an observational design and a mixed methods approach, relying on both qualitative and quantitative data to study the salient components of the PERC model, student achievement of both the TAS and the PERC students, and program implementation and scale-up.

The evaluation activities of the third year focused on the continued implementation of the PERC program in the six New York City schools and the three content areas from the previous year, and on the expansion and scale-up of the program in two additional New York City high schools and three additional content areas. The purposes of our year three evaluation activities are:

- to engage in extensive formative evaluation efforts aimed at optimizing the delivery of the PERC model in the target high schools, including the development of a variety of fidelity of implementation measures;
- to continue the collection of formative and summative data, including piloting any additional measures; and
- to report findings of student achievement (for both the TAS and PERC students) to the Project's management team as the data and findings become available.

III. Findings Highlights

Scale-up and expansion. The Project has not only maintained its presence in participating high schools, but has also expanded in terms of the number of content areas and the number of schools. An impressively large number of students (over 1300) enrolled in these courses during the 2013-2014 academic year. Overall, the Project offered 51 PERC classes: 14 in Living Environment (Biology), 26 in Algebra 1, 4 in Chemistry, 2 in Physics, 3 pilot Algebra 2/Trigonometry classes and two pilot Earth Science classes. *This represents a 34% increase over last year in the number of PERC classes offered across the high schools.* After three years, the Project has trained over 750 TAS and taught more than 2800 students in six subject areas.

Fidelity of Implementation. Overall, the data from the two indicators of fidelity of implementation support the conclusion that the classrooms employed the student centered/TAS facilitated philosophy of the PERC model. That is no small accomplishment as the model is innovative and the classroom observations, in particular, focused primarily on teachers new to the Project.

Curricula. There is now a set of strong, coherent instructional units and lessons that support and drive the learning and teaching of the PERC courses in Living Environment and Integrated Algebra (now known as Algebra 1). The Integrated Algebra curriculum underwent intensive development over the past year which included the transition to Algebra 1 (the new course aligned with New York State-mandated Common Core State Standards). In addition, the Project team completed a comprehensive TAS class curriculum which was also implemented this year. This represents a significant step forward in the development of the program as this truly unique curriculum is likely to strengthen the impact of the TAS experience and consequently optimize model implementation.

Student Performance in the 2013 Summer School. The *MSPinNYC2* summer school produced very high Regents exam passing rates for both Integrated Algebra and Living Environment students. Roughly 90% of the students in both subject areas passed the culminating Regents exams in August 2013. Moreover, in Integrated Algebra, over 40% of the students who passed the exam scored an 80 or above—the admission criterion of “mathematical proficiency” established for entering CUNY without remediation.

PERC Student Achievement during the 2012-13 Academic Year.

- ✓ PERC students had extremely low levels of proficiency in Math and English Language Arts (ELA) as measured by the 8th grade New York State (NYS) exams. Therefore, on average,

this was a low-skilled group upon program entry.

- ✓ Living Environment PERC students scored, *on average, 4.88 points higher* on the Living Environment Regents Exam than if they had not been a PERC student, according to analyses using a matched control group.
- ✓ Living Environment PERC students were *nearly three times (2.8) as likely* to score a 65 or above on the Living Environment Regents exam than if they had not been a PERC student.
- ✓ Living Environment PERC students were *2.6 times as likely* to score a 75 or above on the Living Environment Regents exam than if they had not been a PERC student.
- ✓ Integrated Algebra PERC students *were not more likely*, on average, to score higher on the IA Regents exam than non-PERC students or to score a 65 or above compared to non-PERC students.

TAS Student Achievement during the 2012-13 Academic Year.

- ✓ TAS students also had low levels of proficiency in Math and English Language Arts (ELA) as measured by the 8th grade NYS exams.
- ✓ More than 95% of the TAS in both the Integrated Algebra and Living Environment courses passed (scored above a 65 or above) their subject area Regents exam.
- ✓ TAS in both the Integrated Algebra course and Living Environment courses demonstrated significant improvements in their Regents exam scores *after* the TAS experience

Therefore, the data suggest that for both content areas the TAS experience of reviewing the material and having to teach it in a PERC class enhances content mastery.

IV. Conclusion

The findings suggest the PERC model is well conceived and fully operational in all eight high schools. The Project has also scaled up, increasing the number of classes it offered this second year by 34% and adding two schools. The Project team made significant progress in the areas of curricula development in math and science and the TAS class. In addition, our analyses suggest that the program strongly impacts subject area Regents exam scores for the TAS. Other preliminary analyses suggest that LE PERC students are more likely to out-perform non-program students on the LE Regents exam. The report closes with a discussion of evaluation next steps that include the identification of best practices and program approaches that facilitate sustainability and scale-up.