Empowering Resource Teachers Project (2009-12)

Basic information

- Origin: Spin-off project of PRMSP/AlACiMa funded by a no-cost extension.
- Participants: Involved 14 resource teachers, eight Professional Math & Science (M&S) Resource Centers, and about 300 other 7-12 M&S teachers.
- Aim: Empower the resource teachers to become professional development (PD) trainers of their peers and support the institutionalization of the resource centers

Major activities

Training for trainers

During the 1st two years, STEM faculty trained the resource teachers on specific science or mathematics topics modeling evidence-based pedagogy. Afterwards, they adapted the design of these trainings to train other M&S teachers. In the 3rd year, resource teachers designed the trainings themselves in disciplinary groups, having STEM faculty as consultants.

PD trainings for other M&S teachers

Resource teachers trained other M&S teachers from their own and nearby schools in the resource-centers on M&S topics (See Table 1). These trainings aimed to help teachers deepen their content knowledge and sustain quality teaching (See attendance numbers in Table 2).

Collaborative empowerment evaluation

The evaluators used this model to help resource teachers become more self-determined professionals. In an initial meeting, they identified the project's mission and objectives and took stock of the resource centers' operation. They formed working groups to select and adapt evaluation instruments (among those used on the main project), that they administered in their trainings. Evaluators analyzed the data and facilitated feedback sessions for teachers to examine the results and reflect upon them.

Objectives

The resource teachers who participated in it, following a collaborative empowering evaluation approach, identified objectives for this subproject that were:

1. ***Resource Centers' Services.*** Improve the quantity and quality of services offered in the centers by making equipment and materials accessible to teachers and provide good assistance to teachers and students who request them.

2. ***Quality of trainings.*** Provide trainings aligned to disciplinary content standards and grade expectations, which facilitate transfer of achieved learning to classrooms, in which an environment conducive to sharing and reflecting prevails, with trainers that show a good disposition to clarify doubts and respond to consultations.

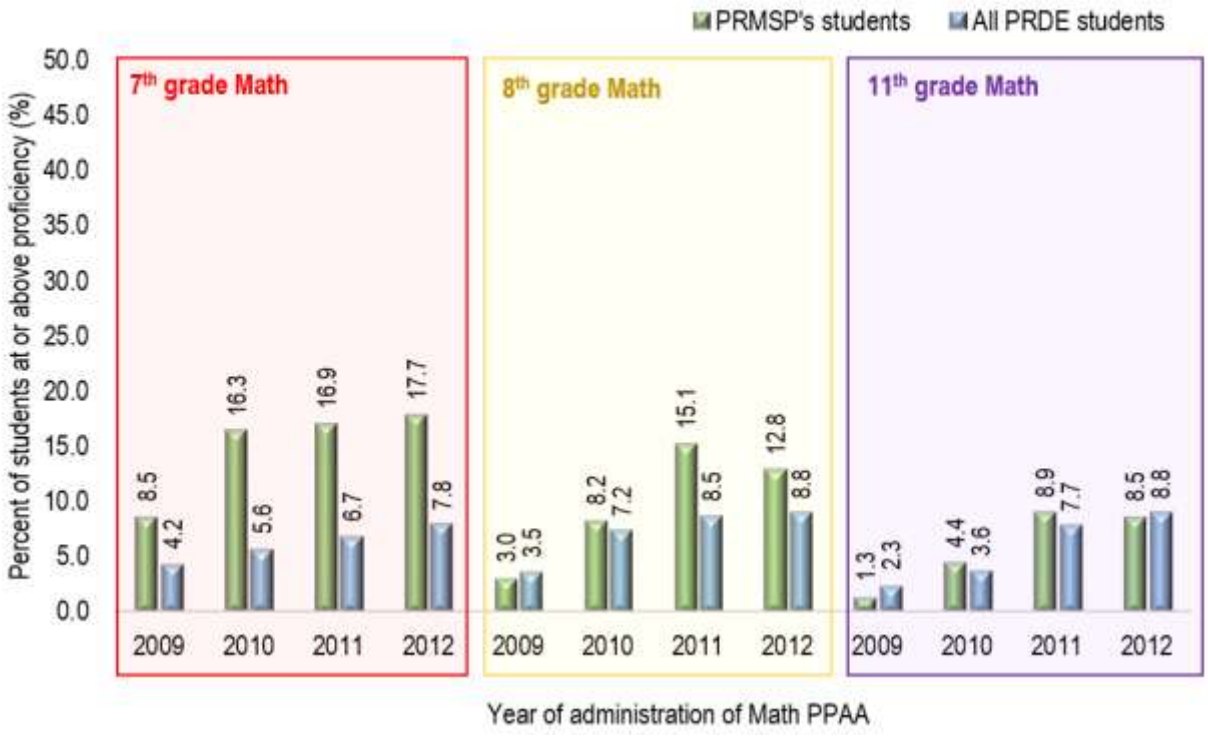
3. ***Teacher learning and transfer.*** Teachers show deep understanding of M&S content, use educational strategies that increase deep learning, use classroom activities that motivate students, show interest for their professional development, for self-learning and life-long learning, and work in teams with other teachers.

4. ***Student learning and achievement.*** Students that attain better academic achievement, have more interest for their M&S classes, apply knowledge obtained in the classroom, and develop a scientific culture.

Significant Results

Student learning

PPAA aggregated data from 2009 to 2012 was used to study student achievement in a trend study. In the resource center-(RC) schools that participated in this project the % of students scoring at/above proficiency level showed a rather consistent tendency for increasing annually (with some exceptions like that for 2012 8th grade science), a trend similar to that of the whole school system (except for 2012 grade 11) (See Figs. 13 & 14).

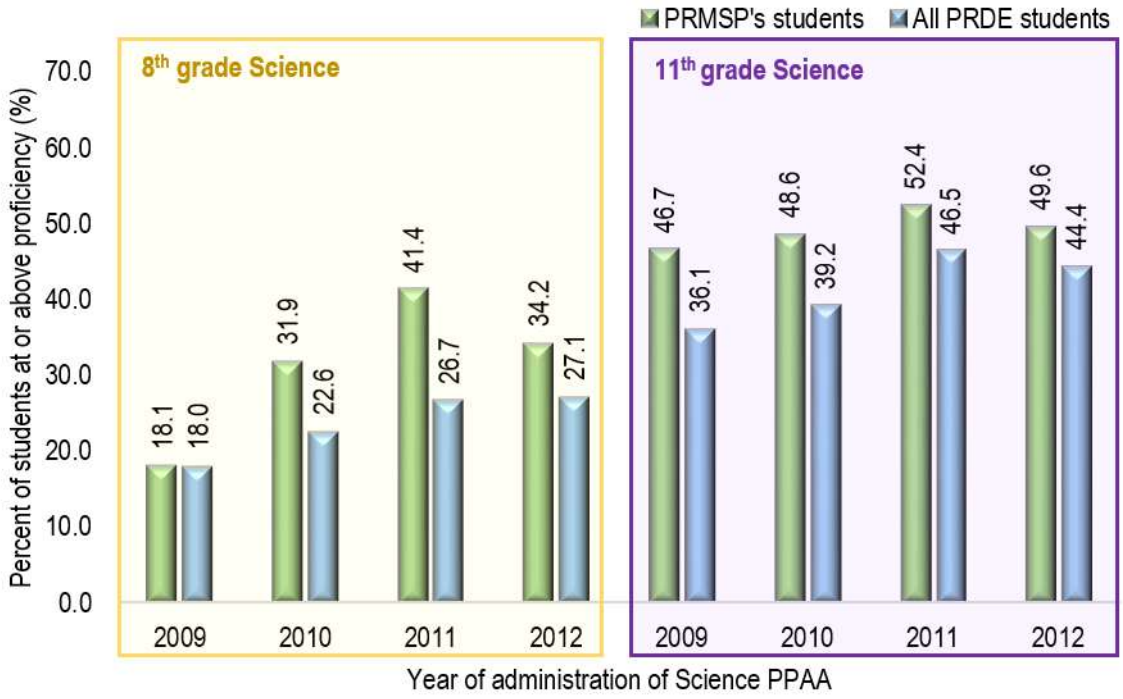


Grade	7th grade Math			
N	2009	2010	2011	2012
RC	613	627	590	593
PRDE	41,956	41,422	40,965	39,110

8th grade Math			
2009	2010	2011	2012
535	558	576	538
39,564	38,424	37,495	36,499

11th grade Science			
2009	2010	2011	2012
789	803	806	801
30,624	30,963	30,048	29,010

Figure 13. **Percentage of students at or above proficiency level on math PPAA tests from Resource Teachers' schools (RC) schools and from all the Puerto Rico Department of Education (PRDE) system.**



Grade	8th grade Science			
N	2009	2010	2011	2012
RC	288	297	263	212
PRDE	38,484	37,928	37,204	36,155

11th grade Science			
2009	2010	2011	2012
711	775	752	614
30,053	30,608	29,815	28,788

Figure 14. **Percentage of students at or above proficiency level on science PPAA tests from Resource Teachers' schools (RC) and from all the Puerto Rico Department of Education (PRDE) system.**

Notably, percentages tended to be consistently higher for schools participating in this project, although these schools were generally similar at baseline (2009) to those of the whole system. Besides the fact that these eight schools were all center-schools in the ALACIMA Main Project, the interventions of this RC subproject, probably explain the observed positive results. Findings thus indicate that the participation of resource teachers in this project positively influenced student gains in achievement in their schools.

Teacher Learning

A panel study was used to evaluate transfer to classrooms of teachers trained by resource teachers using two different pre measures: 1) Prospective: Data from Post-Only survey administered at the start of the teacher's participation in the PD trainings; 2) Retrospective: Pre measure from Pre-Post Survey administered at the end of the 3rd yr. These measures have both strengths and weaknesses to assess use of educational practices.

A statistically significant growth in use of best instructional and assessment practices was observed in both types of analyses for both math and science teachers: results suggest that attending trainings in which resource teachers modeled best educational practices positively influenced trainees' classroom practices (See Figs. 24-26).

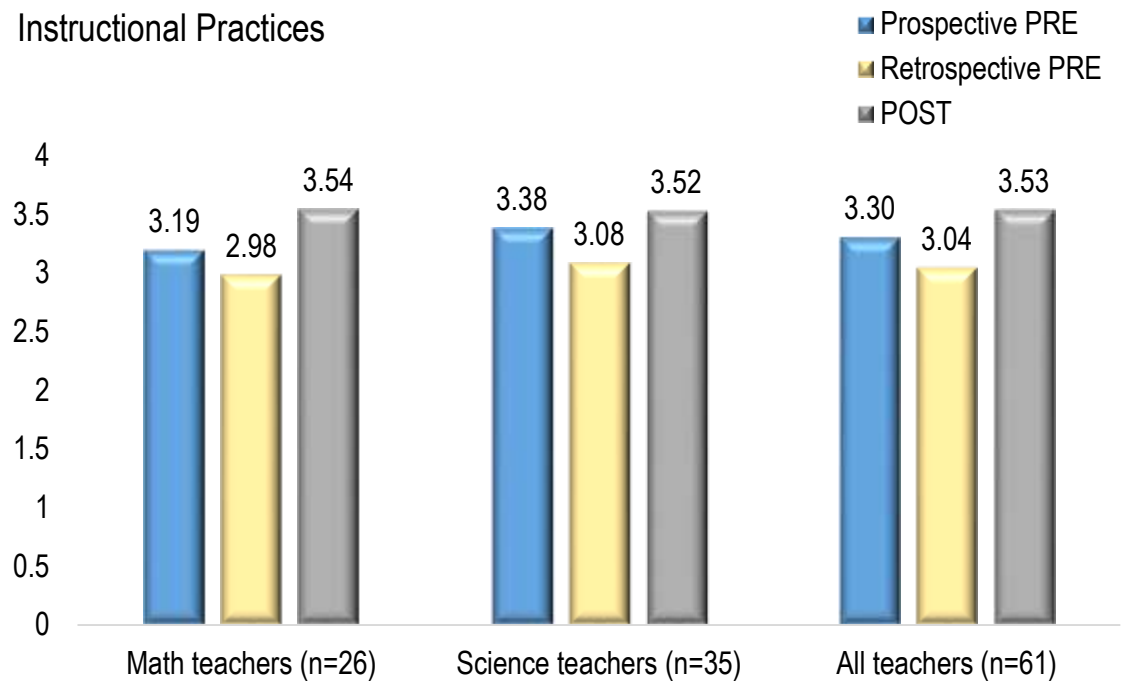


Figure 24. **Prospective (2010/11 pre) and retrospective (2012 pre) comparisons, before and after teachers were trained by resource teachers, regarding usage of instructional practices in their classrooms (N=61)**

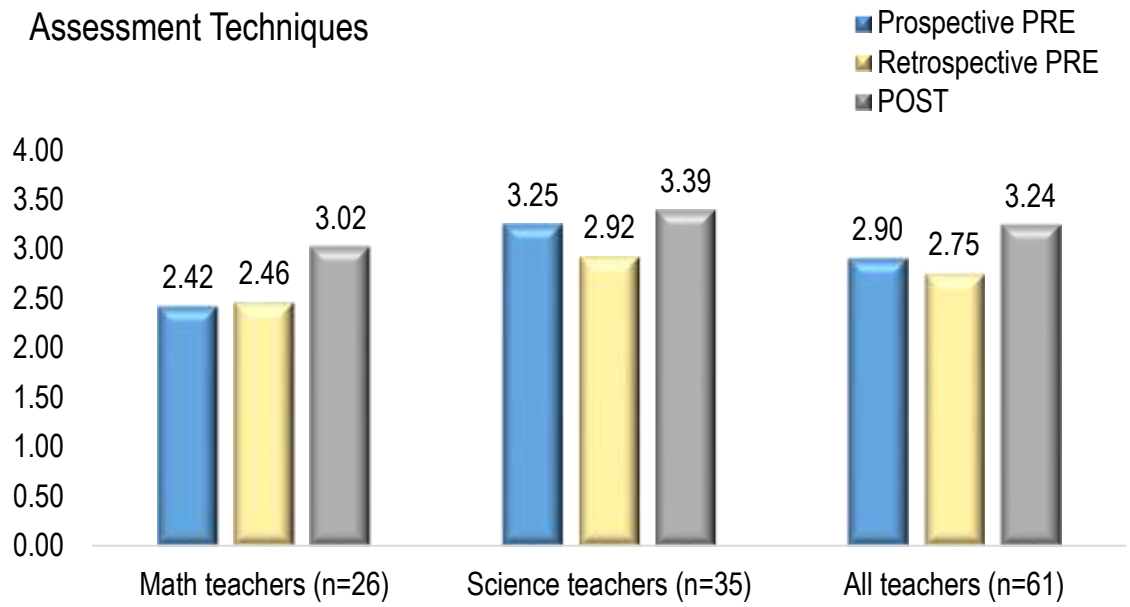


Figure 25. **Prospective (2010/11 pre) and retrospective (2012 pre) comparisons, before and after teachers were trained by resource teachers, regarding usage of assessment techniques in their classrooms (N=61)**

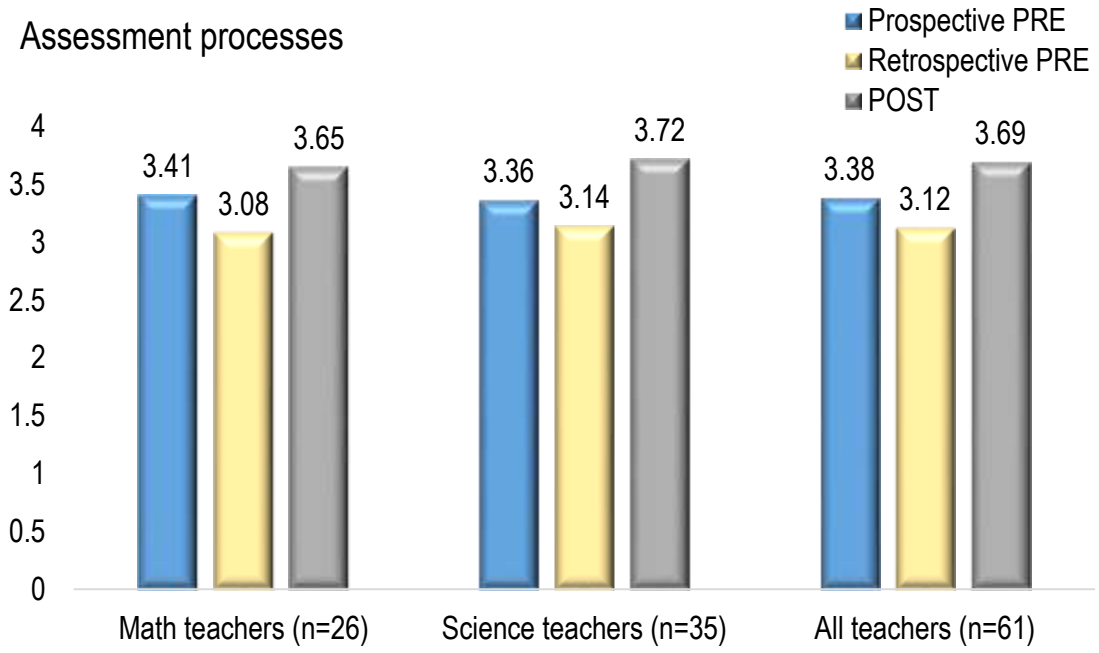


Figure 26. **Prospective (2010/11 pre) and retrospective (2012 pre) comparisons, before and after teachers were trained by resource teachers, regarding usage of assessment processes in their classrooms (N=61)**

Dissemination of results

As stated before, the evaluators used a collaborative empowerment approach in this project to help resource teachers become more self-determined professionals (Fetterman, 2001). The evaluators and project leaders as a team planned the collaborative empowerment evaluation sessions with resource teachers. In these sessions, besides devising the mission and objectives of the project, taking stock of the work in the resource centers, and planning the data collection processes they would implement in the centers, the resource teachers regularly examined evaluation results and reflected upon them.

On year 1, after they had carried out their first training session in the centers, the evaluators and leaders organized a preliminary feedback session based on partial results and observations of the training sessions carried out by the evaluators and project leaders. The activity focused two major issues: (1) the educational practices used in the trainings, and (2) the evidence about teacher learning obtained. Resource teachers were asked to reflect on these issues in disciplinary groups in which they answered and discussed the following questions: What type of learning prevailed in the capacitation, was it active or passive? What do the reaction forms' quantitative and qualitative results show? How good do you consider was the evidence obtained about teachers' learning in the training? What do the pre and post comparisons on teacher learning show? What factors can influence the accurate evaluation of teacher learning in the trainings?

In the next two years, the evaluators planned and implemented, in collaboration with project leaders, sessions to provide feedback to resource teachers about the evaluation results of the previous cycle in which they trained their peers. Teachers worked in small-groups to review each set of results using, as guidelines, reflective questions similar to the ones mentioned before. They identified strengths and weaknesses of the work done in planning, implementing and evaluating the trainings, and other services rendered in the centers. After these small-group activities, the evaluators facilitated a whole-group discussion. At the end of the three-year intervention, evaluators and project leaders planned a final feedback session to reflect on overall results (i.e., teacher post- training reactions, teacher learning, teacher transfer, student achievement, provision of services in centers). Answers provided by the resource teachers in the reflective activities suggest that the evaluation results' feedback sessions were effective in promoting that they think deeply about their training sessions' planning, implementation and evaluation, including the accurate assessment of teacher learning. They also reported that they learned to make data based decisions to improve their work.