Department of Research and Evaluation
AUSTIN INDEPENDENT SCHOOL DISTRICT

AISD REACH Program Update, 2012–2013:
Professional Development Units

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Marie Courtemanche, Ph.D.

EXECUTIVE SUMMARY

In 2010–2011, the Austin Independent School District (AISD) REACH strategic compensation program implemented a new voluntary program element, professional development units (PDUs). A PDU is the sustained study of a topic that expands beyond a single conference session or seminar, is developed by small teacher teams to meet their individual identified needs, and enhances instructional strategies implemented in the classroom. Principals approve team composition and PDU topics, and teachers work together to identify, study, and implement best practice strategies, then demonstrate students' growth in the area of focus. Participants prepare a reflection paper and present findings to a scoring panel that includes their principal and staff from Educator Quality. Those who achieve a passing score receive a stipend of $1,500. In 2012–2013, 13 administrators and 335 teachers participated in PDUs, and 82% achieved a passing score.

Of all 2012–2013 REACH teachers, 19% of elementary teachers (n = 225), 11% of middle school teachers (n = 32), and 12% of high school teachers (n = 78) participated in a PDU. Teacher participation rates increased from 2011–2012 to 2012–2013 for all levels; however, participation increased slightly more at both middle schools and high schools than at elementary schools. For those in REACH during the 2012–2013 school year, almost one-fourth were involved in a PDU at one point in time. Even though 77% of those within the REACH program as of 2012–2013 had never participated, many of them were not within a REACH school in prior years and thus were ineligible to participate. Examining just those teachers within REACH schools from 2010–2011 through 2012–2013 revealed that almost one-third took advantage of the opportunity to become involved at some point. Overall, participants agreed that the PDU experience had benefited them in numerous ways. For example, 96% of those who did a PDU in 2012–2013 agreed that their involvement helped them learn strategies to refine their teaching practices. Moreover, participants were more likely than were non-participants to believe that the AISD REACH program in general had improved their job satisfaction. Elementary school participants grew more in using reflective teaching than did their matched colleagues, however.

Investigating the effect of PDU involvement on relevant variables within the same year of participation found statistically significant relationships. Elementary school teachers, and to some extent middle school participants, were more likely to receive higher appraisal scores than were non-participants. Elementary PDU participants also had a slightly higher percentage of students meeting their student learning objectives (SLOs) in 2012–2013 than did non-participants. Differences in instructional practices also were observed. High school teachers were more likely to use data as well as to engage in collaborative behaviors in 2012–2013 after becoming involved in a PDU than were their counterparts. Similarly, middle school participants were more likely than non-participants to report engaging in reflective teaching practices. The general findings were largely unsupported, however, when matching techniques were employed to address the issue of self-selection in participation. Although significant differences in appraisal scores were found between elementary school teachers and their matched comparisons, no significant differences were found with respect to the percentage of students meeting a SLO,

peer observation scores, Educator Value-Added Assessment System (EVAAS) scores, retention rates, or instructional practices. Even though the matched analyses generally found little in the way of significant relationships, PDU participants may have experienced greater levels of improvement between the year previous to participation and the year of participation than did those who opted not to get involved. When examining this, we generally found no significant difference in improvement between 2012–2013 participants and non-participants with respect to the percentage of students meeting their SLO, appraisal points earned, peer observation scores, and data usage across all levels.

In addition to examining PDU participation effects on relevant metrics within the same year of participation, as well as their effects on improvements from the year previous to participation, we investigated whether significant relationships emerged in subsequent years. Because PDU participation may have had a delayed effect on outcomes, we analyzed the extent to which 2011–2012 PDU participants experienced both higher averages and improvements in student growth, appraisal scores, and peer observation scores between the year of participation, 2011–2012, and the following year, 2012–2013, compared with matched non-participants. In doing so, we found that elementary school participants were more likely to have a higher percentage of their students make SLOs than were matched non-participants in the year following involvement. Likewise, elementary school participants were more likely to report engaging in reflective teaching than were their matched colleagues. No effects were found for the percentage of total points earned in the appraisal system, peer observation, collaboration, or data use.

Overall, it seems likely that although the program was popular and may have had an effect on attitudes, the relationship with regard to behaviors was complicated. It remains likely that the characteristics of the individuals who chose to participate in PDUs explains the relationship between participation and positive outcomes, such as higher levels of self-reported instructional practices, appraisal scores, and students' growth. It could be unrealistic, however, to expect PDU participation to be consistently associated with broad outcomes, such as student growth, given the narrow focus of the study topics. It seems more reasonable to expect them to be related to outcomes connected to the topic of study. Indeed, when we examined the extent to which specific measures on the PDU grading rubric were related to relevant measures, such as student growth, significant relationships were established. This does not concretely answer whether PDU participation had a strong effect on students' and staffs' growth, however. It merely demonstrates the ability of the grading rubric employed by the scoring panel to sufficiently discriminate teacher quality, while tentatively suggesting that effective participation may have led to stronger outcomes. However, we are unable to unconditionally affirm the limited impact of the PDU experience, given that it may have affected a narrow range of outcomes, reflected by the topic of study. Because we were unable to capture metrics specific to the area of study, the question of impact remains unresolved. It does appear that PDU participation had an effect, even if limited, on improving appraisal scores for elementary school teachers from the year previous to involvement, as well as affecting growth in reflective teaching practices and the percentage of students making an SLO in subsequent years for these same teachers.

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What are professional development units (PDUs)?

In 2010–2011, the Austin Independent School District (AISD) REACH strategic compensation program implemented a new program element, professional development units (PDUs). A PDU is the sustained voluntary study of a topic that expands beyond a single conference session or seminar, is developed by small teacher teams to meet their individual identified needs, and enhances instructional strategies implemented in the classroom. PDUs seek to accomplish staffs' and students' growth through improving instructional practice. Teachers are encouraged to form groups with colleagues, based on specific professional development needs, and to participate in a collaborative job-embedded research study of teaching practice throughout the school year, with principals approving team composition and PDU topics. PDU teams must present their year-long work to a panel that scores them on the following dimensions: team collaboration, PDU implementation/instruction, and impact on students' learning. Final scores are calculated by averaging each panel member's overall rating. Participants on teams that receive a score of at least 33 out of 44 points receive a $1,500 stipend. In 2012–2013, 13 administrators and 335 teachers participated in PDUs, and 82% achieved a passing score.[1]

How did we examine whether PDUs improved teachers' performance?

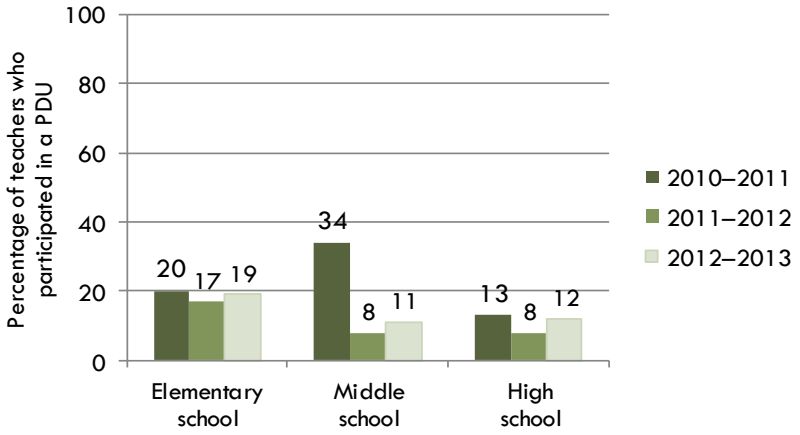
The purpose of this report is to assess differences between PDU participants and non-participants to determine the influence of involvement in a PDU on instructional practices,[2] professional growth, attitudes toward REACH, and student achievement. To realize this end, we scrutinized the data in a variety of ways. First, to achieve a more comprehensive view of the PDU experience, we analyzed results from a PDU impact survey that was administered in Fall 2013 to all former PDU participants. We next examined the differences between 2012–2013 participants and non-participants on numerous outcomes (e.g., student growth, instructional practices, appraisal scores) within the same year of participation, as well as examined the changes from the year prior to involvement on these same measures. This was followed by an analysis that explored the possibility of PDU participation having a delayed effect on relevant outcomes. Consequently, differences in the averages of pertinent 2012–2013 variables and changes over time on these same measures for 2011–2012 PDU participants and non-participants were investigated. We also explored differences in rates of change for 2012–2013 participants and non-participants who scored in the bottom 25% in instructional practices in 2011–2012. To account for differences between the self-selected group of participants and their non-participating peers, analyses were conducted with matched samples of participants and non-participants, where possible.

[1] For more information about PDUs, see http://archive.austinisd.org/inside/initiatives/compensation/pdus.phtml
[2] Within this report, instructional practices refer specifically to data use, collaboration, and reflective teaching.

How many participated in PDUs, how many earned stipends, and what were the average scores for campuses?

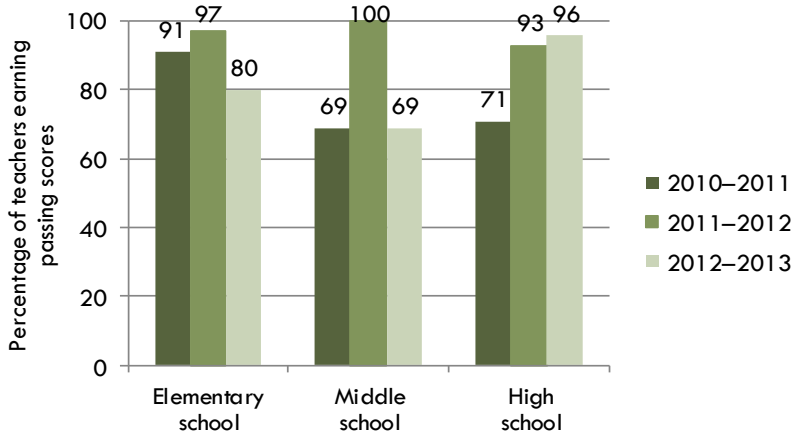
Of all 2012–2013 REACH teachers, 19% of elementary school teachers (*n* = 225), 11% of middle school teachers (*n* = 32), and 12% of high school teachers (*n* = 78) participated in a PDU. Teacher participation rates increased from 2011–2012 to 2012–2013 for all levels; however, participation increased slightly more at both middle schools and high schools than at elementary schools (Figure 1). In addition, more high school teachers than either middle school or elementary school teachers received a passing score for their PDU in 2012–2013. This percentage decreased from the previous year for both elementary teachers and middle school teachers (Figure 2). In regard to actual PDU scores, each level of schooling exhibited notable variation (Table 1).

Figure 1. Professional Development Unit (PDU) Participation Rates, 2010–2011 Through 2012–2013



Source. REACH PDU database

Figure 2. Percentage of Participating Teachers Who Achieved a Stipend for a Professional Development Unit (PDU), 2010–2011 Through 2012–2013



Source. REACH PDU database

Table 1. Descriptive Statistics on Teachers' Professional Development Unit (PDU) Scores, by Level

	Average score	Minimum score	Maximum score	Range	*N*
Elementary school	34.92	26	41	15	225
Middle school	33.69	23	38	15	32
High school	34.53	26	39	13	78

Source. REACH PDU database
Note. A passing PDU score was equal to or higher than 33 out of 44 possible points.

Who participated in PDUs?

Across all levels, core area non-special education teachers made up the largest group of participants, even though the percentage was lower for high school than for elementary and middle school levels (47% vs. 72% and 75%, respectively). Interestingly, the second largest group differed across all levels (Table 2). Non-core teachers comprised the second largest group for high schools, special education teachers comprised the second largest group for elementary schools, and campus administrators and non-core teachers were tied for middle schools.

Table 2. Participation in Professional Development Units (PDUs) by Job Category, 2012–2013

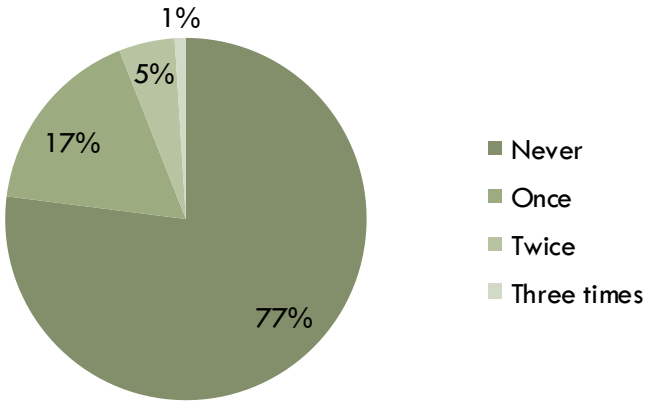
	Elementary school	Middle school	High school
Campus administrator	4% (*n* = 8)	9% (*n* = 3)	14% (*n* = 11)
Core area: non-special education	72% (*n* = 161)	75% (*n* = 24)	47% (*n* = 37)
Counselor	1% (*n* = 3)		
Instructional/curriculum specialist	5% (*n* = 11)		5% (*n* = 4)
Librarian	3% (*n* = 6)		
Non-core teacher	5% (*n* = 12)	9% (*n* = 3)	24% (*n* = 19)
Special education teacher	11% (*n* = 24)	6% (*n* = 2)	9% (*n* = 7)
N	225	32	78

Source. REACH PDU database

How frequently did people participate?

Because the program has been in existence for 3 years, we wanted to examine the frequency with which teachers took advantage of the opportunity to become involved. In doing so, we found that individuals were involved in varying capacities, with a few participating two or even three times. For those in REACH during the 2012–2013 school year, almost one-fourth had participated in a PDU at least once (Figure 3). Even though 77% of those within the REACH program as of 2012–2013 had never participated, many were ineligible to get involved in prior years due to the fact that they were not within a REACH school. Examining just those teachers within REACH schools from 2010–2011 through 2012–2013 revealed that almost one-third took advantage of the opportunity to participate at least once when eligible (Table 3).

Figure 3. Frequency of Professional Development (PDU) Participation for Those at REACH Schools During the 2012–2013 School Year



Source. REACH PDU database

Table 3. Professional Development Unit (PDU) Participation Across Time for Those in REACH from 2010–2011 Through 2012–2013

One time	
2010–2011 PDU only	64 (11%)
2011–2012 PDU only	22 (4%)
2012–2013 PDU only	27 (4%)
Total one time	113 (19%)
Two times	
2010–2011 and 2011–2012 PDU	30 (5%)
2010–2011 and 2012–2013 PDU	16 (3%)
2011–2012 and 2012–2013 PDU	14 (2%)
Total two times	60 (10%)
Three times	
Total 2010–2011, 2011–2012, and 2012–2013	18 (3%)
No participation	
Non-participant all years	410 (68%)
Total number of teachers in REACH from 2010–2011 through 2012–2013	601 (100%)

Source. REACH PDU database

What did PDU participants think of their PDU experience?

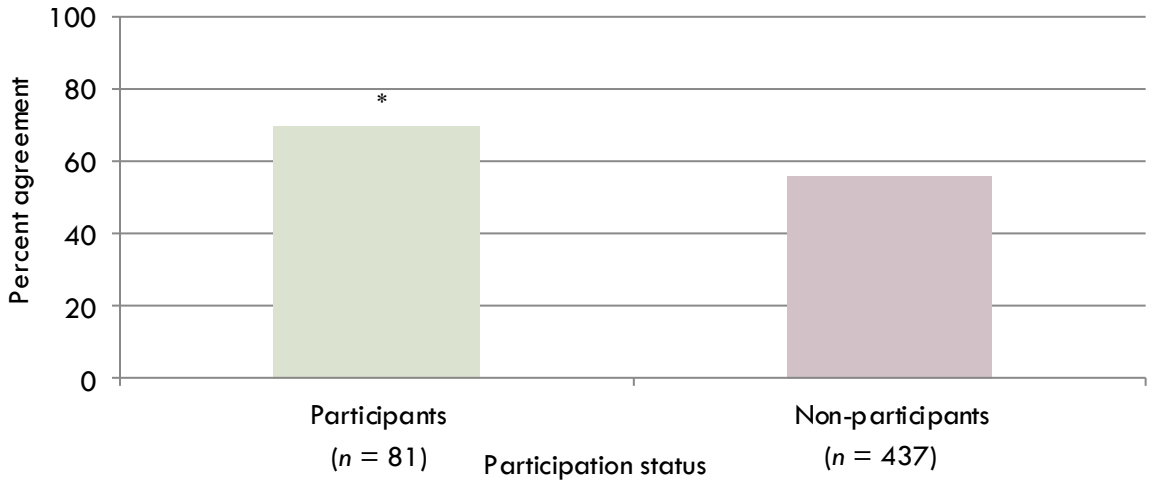
Given the frequency of voluntary and repeat involvement, we anticipated that attitudes toward PDUs among participants would generally be positive. To further understand teachers' attitudes regarding the influence of PDUs on instruction and teacher collaboration, as well as the program's strengths and areas for improvement, a survey was administered in Fall 2013 to all 2012–2013 PDU participants. Roughly 40% (n = 120) of former participants remaining in the school district responded. Overall, participants agreed that participation had benefited them in numerous ways (Table 4). For example, 96% of 2012–2013 PDU participants agreed that their experience had helped them learn strategies to refine their teaching practices (see Appendix A for response options). When asked why people did PDUs, one teacher cited the "opportunity to collaborate with colleagues," as well as the opportunity to "learn new strategies, and the chance to earn an extra stipend." Moreover, participants were more likely than non-participants to agree with the statement that their job satisfaction had improved as a result of the AISD REACH program (Figure 4).

Table 4. Percentage Agreement With Questions Related to 2012–2013 Professional Development Unit (PDU) Participation

Item	Percentage agreement
I learned strategies through my PDU that have helped me refine my teaching.	96%
I understand my students' needs better now than I did before participating in a PDU.	93%
I have seen direct benefits to my students from my participation in a PDU.	92%
Participating in a PDU has helped me analyze my own instructional practices in new ways.	94%
Participating in a PDU has encouraged me to collaborate with other teachers to improve my teaching more than I did before.	92%
Total	*n* = 119

Source. REACH PDU database

Figure 4. Percent Agreement That Job Satisfaction Improved as a Result of the AISD REACH Program



Source. REACH PDU database
†*p* <.10, **p* <.05

What subjects did 2012–2013 PDU participants study?

Elementary school participants (26%) were most likely to study topics related to reading/English language arts (ELA), followed by integrating technology (19%) (Table 5). Roughly one-fifth (19%) of middle school participants studied topics related to English language learners (ELLs). Reading/ELA and integrating technology were tied for the most studied topic among high school participants, with each accounting for 21% of the total. Topics of study have changed over time, with greater interest at the elementary and high school levels in reading/ELA more recently, and a general decline overall in the study of ELLs/dual language.

Table 5. Percentage of Participants Studying Professional Development Unit (PDU) Subjects, 2010–2011 Through 2012–2013

	Elementary school			Middle school			High school		
	2010–2011	2011–2012	2012–2013	2010–2011	2011–2012	2012–2013	2010–2011	2011 – 2012	2012–2013
Advancement Via Individual Determination (AVID)						9%	7%	34%	
Art	3%	3%					3%		
Core: Math	5%	15%	3%					9%	
Core: Reading/English language arts[a]	25%	7%	26%	9%	18%				21%
Core: Science	10%		2%				8%		
Core: Writing	4%	9%					10%		
Cross-curricular[b]						13%			17%
Culturally responsive teaching	8%	25%	4%		14%	9%		11%	4%
Data use	2%								
Discipline		19%	9%			9%			
English language learners/Dual language	30%	7%	11%	45%	18%	19%	61%	11%	5%
General teaching methods	3%	12%	9%	40%	14%	13%		20%	19%
Health			3%					7%	
Integrating technology	5%		19%	5%	36%	13%	11%	7%	21%
Music		4%							
Social and emotional learning[b]			6%			16%			
Special education	5%		2%						
Working with teachers[b]			6%						14%
Total	100	106	225	55	22	32	71	44	78

[a] The topic of Core: Early literacy, which was included in past reports, was incorporated within Core: Reading/ English language arts in this report.
[b] Indicates a new topic in 2012–2013.

To what extent did 2012–2013 PDU participants and non-participants differ in the year of involvement?

We first examined the relationship between PDU involvement and years of experience, student growth, appraisal score, peer observation score, and retention within the same year of participation. Although none of these variables was consistently significant across the various levels of school, the most robust finding emerged for appraisal scores (Table 6). Elementary school participants, and to a limited extent middle school participants, received higher appraisal scores than did non-participants in the year of participation. Elementary PDU participants also had a slightly higher percentage of students meeting their student learning objectives (SLOs) in 2012–2013 than did non-participants. Even though PDU participants at the middle school level demonstrated a similar pattern, the relationship was not statistically significant. Years of teaching experience was less related to participation. Although high school teachers who participated in PDUs in 2012–2013 had fewer years of teaching experience, on average, than did those who chose not to participate, no discernible difference was found at either the elementary or middle school level. Teachers who participated in a PDU at the elementary level were more likely to remain at their school in Fall 2013 than were their peers who did not participate. Finally, high school ELA teachers who participated generally had lower levels of student growth in 2012–2013 than did their peers who did not participate in PDUs.

Table 6. Years of Experience, Student Performance, Appraisal Scores, and Retention Rates for 2012–2013 Professional Development Unit (PDU) Participants and All Non-Participants

	ES participants	All ES non-participants	MS participants	All MS non-participants	HS participants	All HS non-participants
Years of teaching experience	10.2 yrs (*n* = 225)	10.9 yrs (*n* = 961)	8.3 yrs (*n* = 32)	8.0 yrs (*n* = 257)	6.9 yrs * (*n* = 78)	9.4 yrs (*n* = 574)
Percentage of students meeting SLO, 2012–2013	82% † (*n* = 225)	79 % (*n* = 930)	77% (*n* = 32)	72% (*n* = 238)	69% (*n* = 78)	71% (*n* = 532)
EVAAS reading/English language arts, 2012–2013	-0.31 (*n* = 28)	-0.09 (*n* = 135)	-0.69 (*n* = 10)	-.08 (*n* = 32)	-.73 * (*n* = 12)	.49 (*n* = 42)
EVAAS math, 2012–2013	-.83 (*n* = 26)	-.72 (*n* = 122)	-2.13 (*n* = 5)	-1.75 (*n* = 34)	.03 † (*n* = 6)	1.73 (*n* = 49)
Percentage of total points earned in appraisal system, 2012–2013	81% * (*n* = 171)	79% (*n* = 762)	77%† (*n* = 25)	73% (*n* = 177)	72% (*n* = 50)	73% (*n* = 375)
Peer observation score, 2012–2013	81% (*n* = 183)	79% (*n* = 819)	78% (*n* = 29)	76% (*n* = 203)	77% (*n* = 64)	79% (*n* = 486)
Retention rates, Fall 2013	85% * (*n* = 192)	77% (*n* = 839)	75% (*n* = 28)	79% (*n* = 209)	79% (*n* = 62)	82% (*n* = 503)

Source. REACH PDU database
Note. SLO is student learning objective; EVAAS is Educational Value Added Assessment System. ES is elementary school, MS is middle school, and HS is high school.
†$p < .10$, *$p < .05$

Did 2012–2013 PDU participants have greater percentages of students meeting their SLOs and higher appraisal and observation scores than did a matched sample of non-participants?

Although 2012–2013 PDU participation corresponded to numerous positive outcomes, as mentioned previously, these findings could be driven by self-selection. More specifically, teachers who chose to participate in a PDU may already have differed in important ways from those who chose not to participate (Ibanez & Schmitt, 2013). As such, the PDU experience itself may not have resulted in the positive outcomes but rather they may have been the result of the characteristics of teachers who opted to participate. Because participants and non-participants differed on relevant characteristics pertaining to the variables of interest (Appendix B), a propensity score matching (PSM) analysis was performed to obtain matched samples of PDU participants and non-participants. PSM analysis is a statistical technique that permits researchers to infer causal treatment effects in non-randomized settings by selecting control group individuals who are similar to treatment group individuals based on the distribution of other relevant characteristics (i.e., covariates) (D'Agostino, 1998). Using this method to control for self-selection, a significant difference in 2012–2013 appraisal scores between elementary school teachers and their matched comparisons was established. No significant differences with respect to the percentage of students meeting SLOs or peer observation scores were observed, however (Table 7). Similar null results were obtained with EVAAS scores and retention rates (Appendix C). Overall, this suggests that the significant differences between 2012–2013 PDU participants and non-participants for factors other than appraisal scores may be the result of pre-existing differences in who chose to participate.

Table 7. Average Percentage of a Teacher's Students Meeting Their Student Learning Objective (SLO), Average Appraisal Scores, and Average Peer Observation Scores for 2012–2013 Professional Development Unit (PDU) Participants and Matched Non-Participants

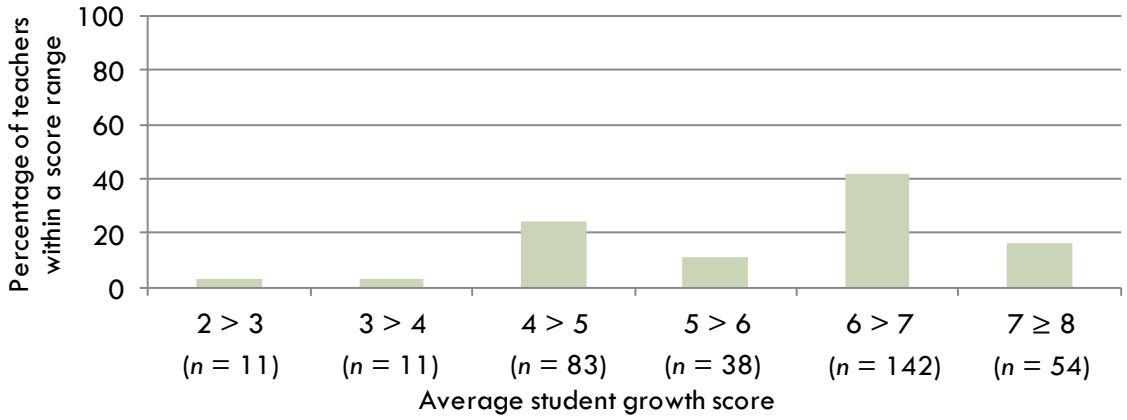
	ES participants	ES matched non-participants	MS participants	MS matched non-participants	HS participants	HS matched non-participants
Percentage of students meeting SLO, 2012–2013	87% (*n* = 49)	85% (*n* = 48)	80% (*n* = 19)	77% (*n* =18)	77% (*n* = 23)	72% (*n* = 25)
Percentage of total points earned in appraisal system, 2012–2013	83%* (*n* = 117)	80% (*n* = 108)	80% (*n* = 16)	74% (*n* = 14)	73% (*n* = 24)	69% (*n* = 16)
Peer observation score, 2012–2013	82% (*n* = 47)	81% (*n* = 46)	79% (*n* = 16)	78% (*n* = 16)	77% (*n* = 23)	79% (*n* = 22)

Source. REACH PDU database
Note. ES is elementary school, MS is middle school, and HS is high school.
†p <.10, *p <.05

Were PDU scores related to student growth, peer observation scores, and instructional practices?

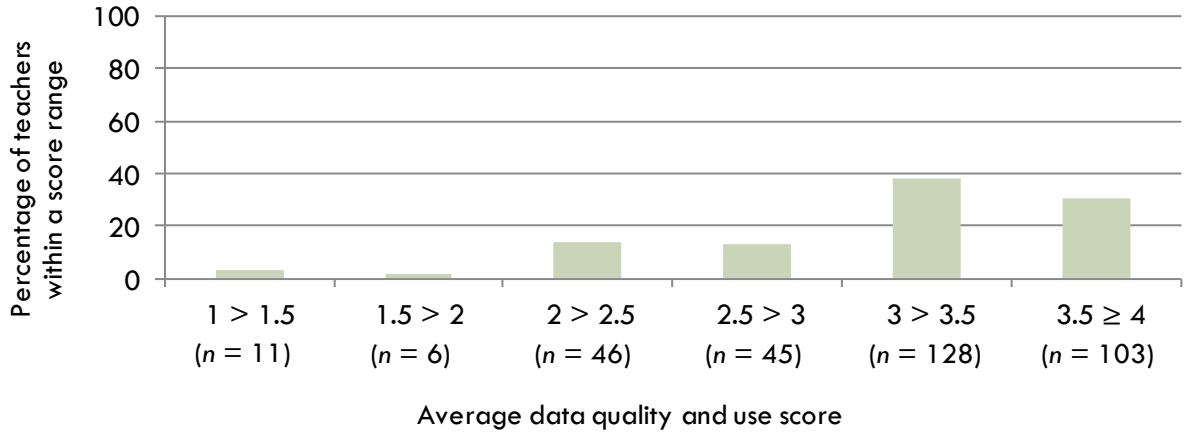
It could be unrealistic to expect PDU participation to be related to broad outcomes, such as student growth, given the narrow focus of the study topics. It would be more reasonable to expect participation to be associated with outcomes related to the specific topic of study. To this end, we examined the relationship between final PDU scores, student growth, peer observation scores, and instructional practices. Participants were assessed on the degree to which they met various criteria, using a grading schema containing measures capturing PDU impact on students' learning as well as impact on instruction, among others (see Appendix D1 for a list of the grading categories and D2 for an example of the grading rubric). We employed both the individual indicators that were part of the grading rubric within a category as well as scales comprising these indicators to assess how well the scores related to our variables of interest. The range of the indicators exhibited variability, although higher scores were more likely in general (Figures 5 and 6).

Figure 5. Percentage of Teachers Within Student Growth Score Range From Professional Development Unit (PDU) Grading Rubric



Source. REACH PDU database

Figure 6. Percentage of Teachers Within Data Quality and Use Score Range From Professional Development Unit (PDU) Grading Rubric



Source. REACH PDU database

We examined how PDU scoring was related to student growth, peer observation scores, and instructional practices to see how well the PDU grading rubric differentiated teacher quality. For instance, PDU participants who scored higher on the overall impact on student learning measure should also have exhibited greater EVAAS gains and higher percentages of students making their SLOs compared to those who scored low (Table 8). Interestingly, this was mildly supported by the data.[3] EVAAS scores in both mathematics and reading/ELA had weak, but in some cases statistically significant, correlations with the impact on student learning scores as well as with the implementation/impact on instruction scores. Teachers with greater EVAAS gains in reading/ELA were more likely to have higher scores in teacher development specifically, but also in instructional impact more generally than those who scored low. Peer observation scores and the implementation/impact on instruction scores were similarly related. Although less strongly correlated, the impact on instruction scale as well as on some of its subcategories, was also related to changes in the percentage of students meeting their SLO between 2011–2012 and 2012–2013. Unfortunately, even though PDU grading rubric scores were mildly related to relevant measures, such as student growth the analysis was not able to concretely answer whether PDU participation had a strong causal effect. It merely demonstrated the ability of the grading rubric employed by the scoring panel to sufficiently discriminate teacher quality.

Table 8. Relationship between Professional Development Unit (PDU) Grading Metrics and Math EVAAS scores, Reading/English Language Arts EVAAS scores, Change in Percentage of Students Meeting a Student Learning Objective (SLO), and Peer Observation Scores

	Impact on student learning			Implementation/ impact on instruction			
	Student growth	Data quality use	Impact on student learning scale	Application of study	Use of resources	Teacher development	Impact on instruction scale
Math EVAAS, 2012–2013	.25 (*n* = 37)	.24 (*n* = 37)	.25 (*n* = 37)	.11 (*n* = 37)	-.06 (*n* = 37)	.27† (*n* = 37)	.14 (*n* = 37)
Reading/ English language arts EVAAS, 2012–2013	.20 (*n* = 50)	.23 (*n* = 50)	.21 (*n* = 50)	.24† (*n* = 50)	.14 (*n* = 50)	.38* (*n* = 50)	.30* (*n* = 50)
Change in percentage of students meeting SLO, 2011–2012 to 2012–2013	.08 (*n* = 167)	.14† (*n* = 167)	.11 (*n* = 167)	.15* (*n* = 167)	.11 (*n* = 167)	.17* (*n* = 167)	.17* (*n* = 167)
Peer observation, 2012–2013	.03 (*n* = 278)	.09 (*n* = 278)	.05 (*n* = 278)	.23* (*n* = 278)	.19* (*n* = 278)	.15* (*n* = 278)	.22* (*n* = 278)

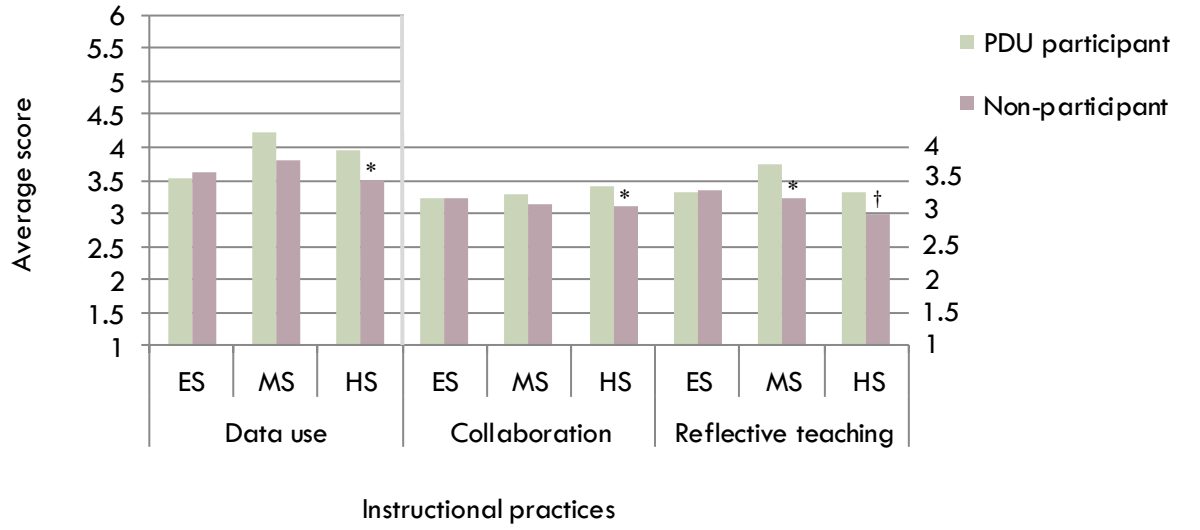
Source. REACH PDU database
† $p < .10$, *$p < .05$

[3] The table includes only strong relationships. Additional analyses exploring science EVAAS scores, the percentage of students meeting their SLO, appraisal scores, and engagement in instructional practices are included in Appendix D2.

In what ways did 2012–2013 PDU participation relate to data use, collaboration, and reflective teaching?

In addition to professional and student growth, we expected that PDU participation would influence instructional practices related to data usage, reflective teaching, and collaboration. Indeed, the 2010–2011 PDU participants reported higher ratings on measures of instructional practice after participation than did non-participants (Schmitt, 2011). Similarly, 2011–2012 PDU participants reported significantly more engagement in collaboration[4] and more data use than did non-participants (Ibanez & Schmitt, 2013). Given these trends, we expected that the 2012–2013 participants would display similar patterns, and this was the case for some of the variables (Figure 7). High school teachers who participated in a PDU were more likely to use data as well as to engage in collaborative behaviors in 2012–2013 than were their counterparts. Moreover, the relationship between reflective teaching practices and participation barely missed conventional criteria for statistical significance ($p = .07$). Middle school participants were similarly more likely than non-participants to report engaging in reflective teaching practices. No connection was apparent between instructional practices and PDU participation at the elementary school level, however.

Figure 7. Average Self-Reported Scores on Data Use, Collaboration, and Reflective Teaching Practices for Professional Development Unit (PDU) Participants and All Non-Participants Across School Levels for 2012–2013



Source. REACH PDU database
†p <.10, *p <.05

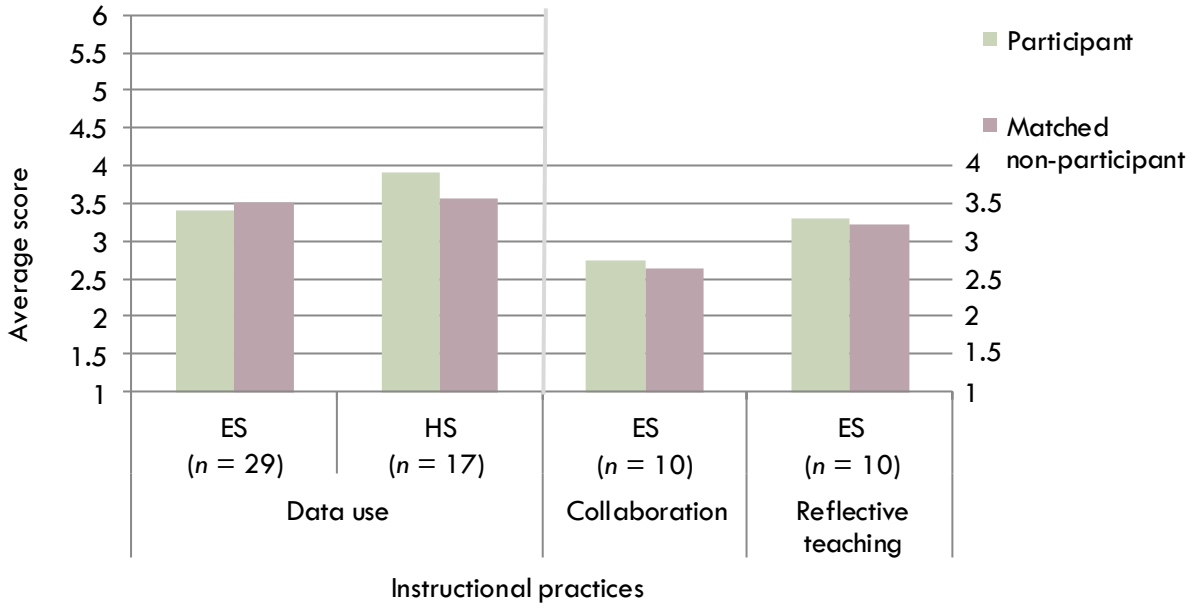
Note. Data use is on a 1–6 scale. Collaboration and reflective teaching are on a 1–4 scale. See Appendix E for sample size information. ES is elementary school, MS is middle school, and HS is high school.

[4] Past reports used the terminology professional learning communities (PLCs) instead of collaboration. Each scale comprised the same survey items so comparisons with past data can be made. See Appendix A for question wording.

Did 2012–2013 PDU participants have better instructional practices than did a matched sample of non-participants?

Because the positive findings related to instructional practices (i.e., compared with non-participants high school participants were more likely to engage in both data use and collaboration, and middle school PDU participants were more likely to engage in reflective teaching) may have been driven by self-selection, we examined the relationship between instructional practices and participation using the PSM technique as well.[5] On the whole, no significant differences were found between PDU participants and their matched comparison teachers (Figure 8). This suggests that the significant findings involving participation and outcomes captured within the same year of involvement may have been due to the characteristics of the teachers who chose to do PDUs rather than due to the PDU itself.

Figure 8. Average Collaboration, Reflective Teaching, and Data Use Scores for 2012–2013 Professional Development Unit (PDU) Participants and Matched Non-Participants



Source. REACH PDU database
†p <.10, *p <.05

Note: Data use is on a 1–6 scale. Collaboration and reflective teaching are on a 1–4 scale. ES is elementary school, MS is middle school, and HS is high school.

[5] PSM was possible only at the elementary school level and to a limited extent the high school level due to sample size limitations.

To what extent did 2012–2013 PDU participants grow from 2011–2012 to 2012–2013 compared with non-participants?

Even though the matched analyses generally found little in the way of significant relationships between involvement and desirable outcomes, it may be that PDU participants experienced greater levels of improvement between the year previous to participation and the year of participation, compared with those who opted not to get involved. That is to say the effect of PDUs might not have been captured through the examination of relationships within the same year of participation. As a result, we explored the extent to which 2012–2013 participants grew on relevant measures over the time-period between 2011–2012 and 2012–2013, compared with non-participants. In doing so, we generally found no significant differences in improvement between 2012–2013 participants and non-participants with respect to the percentage of students meeting their SLO, appraisal points earned, peer observation scores, and data usage across all levels (Table 9). Additional analyses examining improvements in EVAAS scores, collaboration, and reflective teaching at the elementary school level were similarly insignificant (Appendix F).[6] However, a significant difference was found between high school participants and non-participants with respect to improvement in the percentage of students meeting their SLO, albeit in the wrong hypothesized direction.

Table 9. Average Change From 2011–2012 to 2012–2013 for 2012–2013 Professional Development Unit (PDU) Participants and All Non-Participants

	ES participants	All ES non-participants	MS participants	All MS non-participants	HS participants	All HS non-participants
Percentage of students meeting SLO change, 2011–2012 to 2012–2013	2.22 (*n* = 95)	2.53 (*n* = 390)	.67 (*n* = 18)	4.2 (*n* =117)	-9.41* (*n* = 36)	4.85 (*n* = 336)
Percentage of total points earned in appraisal system change, 2011–2012 to 2012–2013	.74 (*n* = 146)	-.63 (*n* = 541)	8.08 (*n* = 14)	-.64 (*n* = 111)	-2.92 (*n* = 26)	-.18 (*n* = 211)
Peer observation score change, 2011–2012 to 2012–2013	-.81 (*n* = 88)	-.43 (*n* = 374)	-.05 (*n* = 16)	-2.7 (*n* = 114)	-5.58 (*n* = 34)	-4.44 (*n* = 313)
Data use change, 2011–2012 to 2012–2013	-.26 (*n* = 76)	-.22 (*n* = 306)	.48 (*n* = 10)	.33 (*n* = 59)	.15 (*n* = 25)	-.02 (*n* = 226)

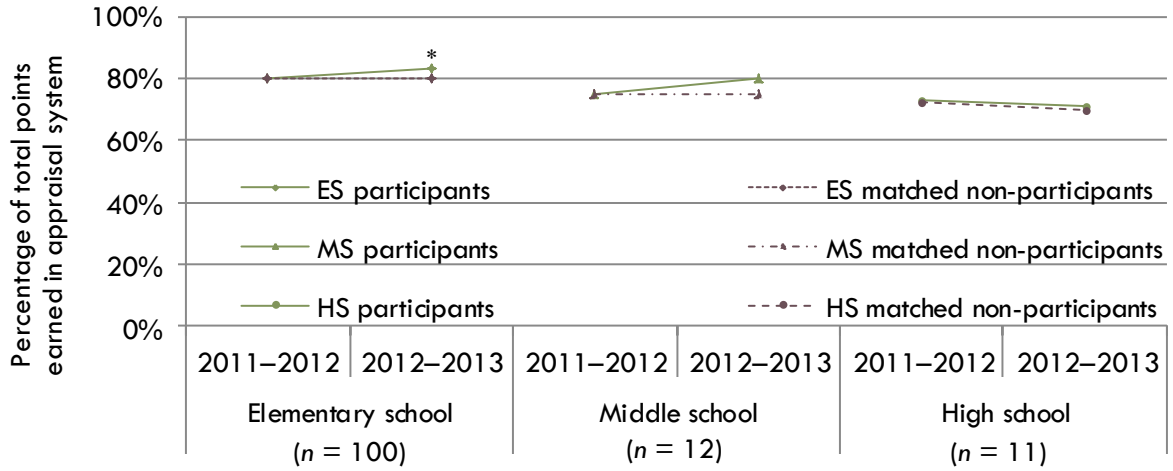
Source. REACH PDU database
†*p* <.10, **p* <.05
Note. ES is elementary school, MS is middle school, and HS is high school.

[6] Due to sample size limitations, these analyses were limited to the elementary school level.

To what extent did 2012–2013 PDU participants grow from 2011–2012 to 2012–2013, compared with their matched counterparts?

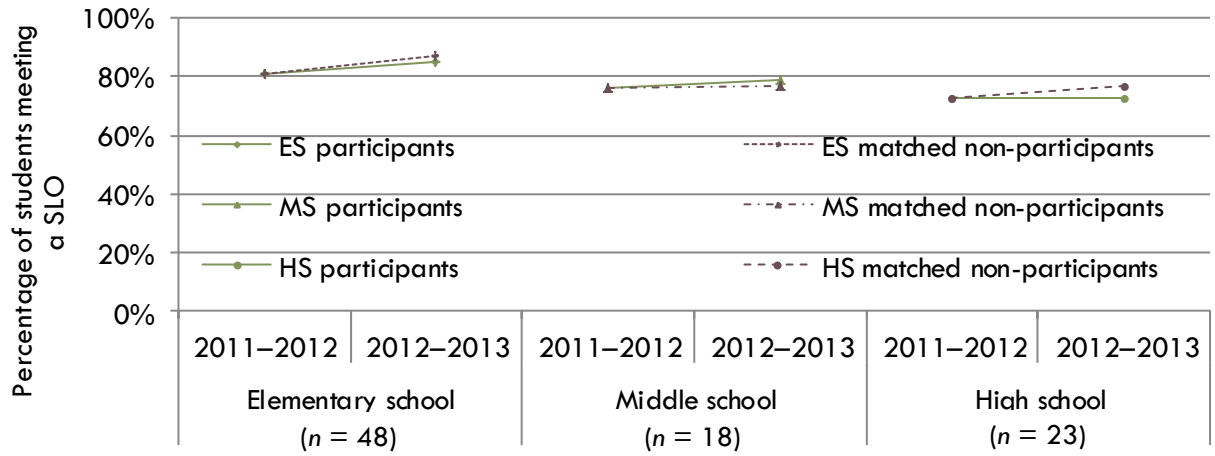
We also examined improvements from previous years using the PSM technique, given the potential influence of self-selection. Examining improvements from 2011–2012 to 2012–2013 with respect to the percentage of total appraisal points earned for both 2012–2013 participants and their matched comparison teachers revealed a statistically significant relationship at the elementary school level but not the middle school or high school level (Figure 9). Elementary school participants' appraisal scores improved more than did those of matched non-participating peers. No differences over time emerged between PDU participants and their matched comparison teachers with respect to the percentage of students meeting their SLOs across all levels (Figure 10), nor for peer observation, data use, and EVAAS scores at the elementary school level (see Appendices G1-G3, but note that analyses were limited across school levels due to small sample sizes).

Figure 9. Improvements in the Percent of Appraisal Points Earned for 2012–2013 Participants and their Matched Colleagues



Source. REACH PDU database
†*p* <.10, **p* <.05

Figure 10. Improvements in the Percent of Students Meeting their SLO for 2012–2013 Participants and their Matched Colleagues



Source. REACH PDU database
†*p* <.10, **p* <.05

Did 2011–2012 PDU participants experience higher appraisal scores and greater growth than did their matched sample of non-participants?

In addition to examining PDU participation effects on relevant metrics within the same year of participation, as well as their effects on improvements from the year previous to participation, we investigated whether significant relationships emerged between participants and their matched colleagues in subsequent years. Because PDU participation may have had a delayed effect on outcomes, we conducted an analysis examining the relationship between participation and both average scores and improvements in these scores for a variety of variables over the 2011–2012 to 2012–2013 time period for 2011–2012 participants and their matched colleagues.[7] Former elementary school participants had higher percentages of students meeting their SLO than did matched non-participants (Table 10). Similarly, former PDU participants were more likely to engage in reflective teaching than were their matched comparisons in the year following their PDU, as well as to exhibit greater improvements in engagement. No significant differences were found between participants and their matched colleagues for collaboration, data use, peer observation and appraisal points earned.

Table 10. Average 2012–2013 Appraisal Scores and Their Changes From 2011–2012 to 2012–2013 for 2011–2012 Professional Development Unit (PDU) Participants and Their Matched Non-Participants at the Elementary School Level

	2012–2013		Change between 2011–2012 and 2012–2013	
	Participants	Matched non-participants	Participants	Matched non-participants
Percentage of students meeting SLO	90%* (*n* = 36)	82% (*n* = 56)	1.3 (*n* = 36)	-1.9 (*n* = 56)
Percentage of total points earned in appraisal system	79% (*n* = 37)	79% (*n* = 43)	-4.3 (*n* = 37)	-4.3 (*n* = 43)
Peer observation	81% (*n* = 48)	81% (*n* = 51)	-.81 (*n* = 48)	-.51 (*n* = 51)
Data use	3.77 (*n* = 34)	3.48 (*n* = 41)	-.25 (*n* = 34)	-.56 (*n* = 41)
Reflective teaching	3.57* (*n* = 11)	3.34 (*n* = 11)	.10* (*n* = 11)	-.10 (*n* = 11)
Collaboration	3.20 (*n* = 10)	2.96 (*n* = 9)	-1.0 (*n* = 10)	-.38 (*n* = 9)

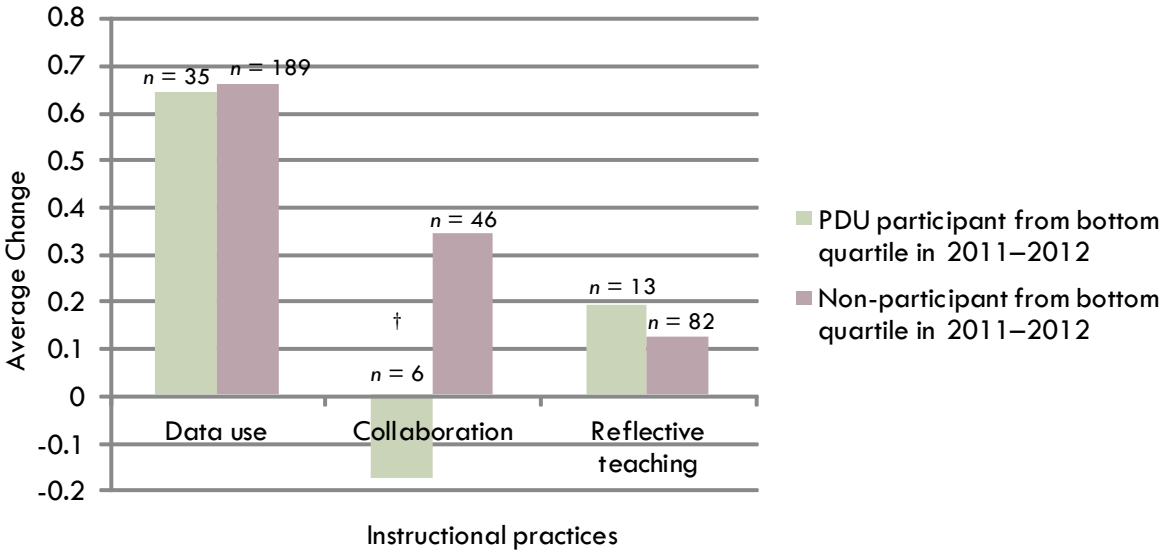
Source. REACH PDU database
†*p* <.10, **p* <.05

[7] This analysis was only possible at the elementary school level due to the small number of PDU participants at the middle and high school levels. The analysis was also conducted using a non-matched comparison group (Appendices H1 and H2).

Did 2012–2013 PDU participants with the lowest ratings in instructional practice in 2011–2012 improve more than did non-participants with the same characteristics?

Although strong and consistent relationships were not found between improvements in instructional practices and PDU participation as a whole for either 2011–2012 or 2012–2013 participants, it could be that participation benefited most those who started at the low end of the spectrum on these measures. Consequently, it was meaningful to analyze whether individuals low in desirable instructional practices to begin with were more likely to engage in them after participating in a PDU than were those choosing not to partake in a PDU. Indeed, prior research has demonstrated greater effects for those low in data usage prior to participation (Ibanez & Schmitt, 2013). To determine whether participation in a 2012–2013 PDU influenced those who needed the most improvement, teachers were categorized into quartiles based on their prior year (2011–2012) self-reported behaviors on data use, reflective teaching, and collaboration. Changes between 2011–2012 and 2012–2013 were then computed, and comparisons between PDU participants and non-participants were made. Even though PDU participants generally experienced growth across time, with the exception of collaborative behaviors, no statistically significant differences between bottom quartile participants and non-participants emerged for changes in data use or reflective teaching (Figure 11). PDU participants low in collaboration were slightly less likely to improve collaboration after having participated in a PDU than were non-participants.

Figure 11. Average Change in Self-Reported Data Use, Collaboration, and Reflective Teaching Practices Scores Between 2011–2012 and 2012–2013 for Professional Development Unit (PDU) Participants and Non-Participants Scoring in the Bottom Quartile in 2011–2012

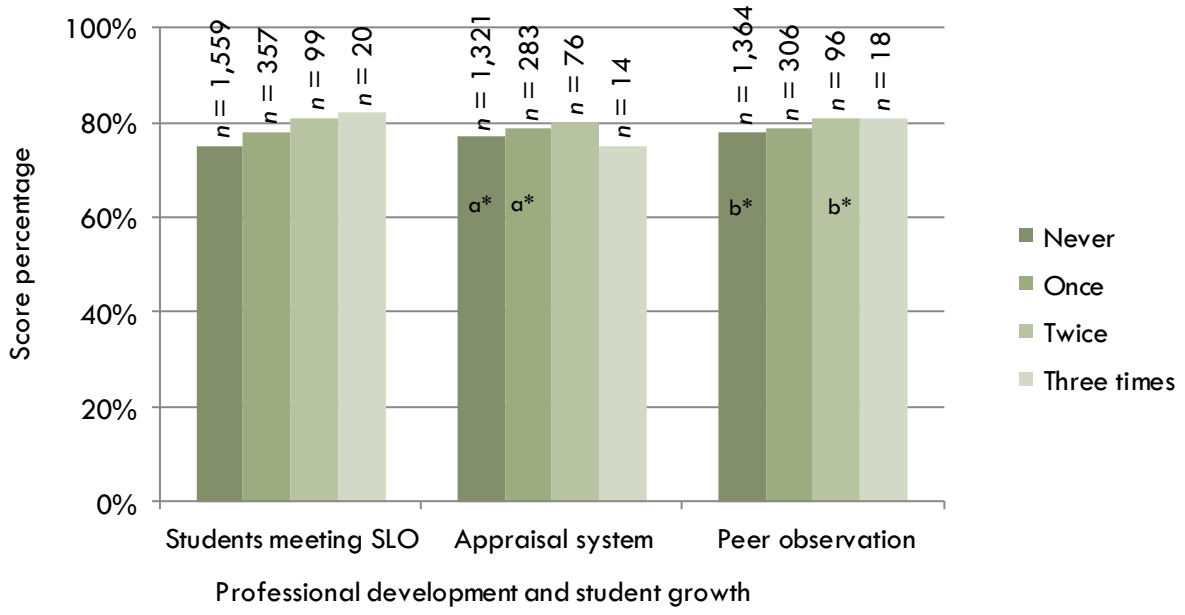


Source. REACH PDU database
†p <.10, *p <.05

Do years of PDU participation influence appraisal system scores, student growth, and instructional practices?

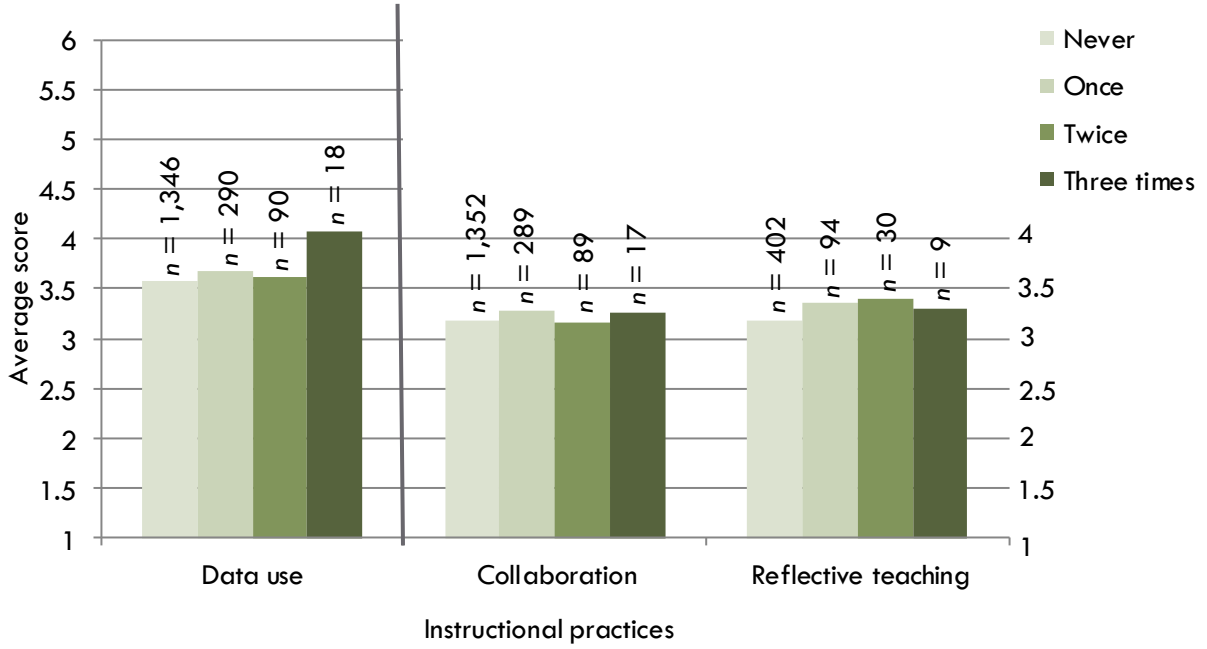
Even though participation had a limited effect overall, it seemed feasible that repeated involvement could result in the greatest impact. As such, we expected that teachers participating with the greatest frequency would have the highest scores across outcomes. To understand whether consecutive participation influenced appraisal system scores, student growth, and instructional practices, we examined differences in these outcomes between teachers with varying participation frequencies. In doing so, we found significant differences between the overall means for each of the outcomes with the exception of data usage. Moreover, the means suggest that some participation was better than no participation (Figures 12 and 13). However, outcomes did not necessarily improve incrementally with increased participation. Having participated three times rather than once or twice, for example, was not associated with stronger outcomes. Even though statistically significant differences were found for the overall means, no significant differences manifested between the various levels of involvement across the different measures, with the exception of having participated twice versus never for peer observation scores, and having participated once versus never for appraisal scores. Interestingly, overall differences in mean scores also appeared when changes between 2011–2012 and 2012–2013 were investigated, but only for appraisal scores and the number of students making their SLO. Significant differences were found for changes in the appraisal system scores, but these were in the wrong direction (Appendices I1 and I2).

Figure 12. The Influence of Repeated Professional Development Unit (PDU) Participation on Professional Development and Student Growth



Source. REACH PDU database
†p <.10, *p <.05
Note. Letters indicate statistical test comparison groups within a category. For example, a indicates that a statistically significant relationship was found between those who never participated and those who participated once for appraisal scores.

Figure 13. The Influence of Repeated Professional Development Unit (PDU) Participation on Instructional Practices



Source. REACH PDU database
†p <.10, *p <.05

Conclusion

In 2010–2011, the AISD REACH strategic compensation program implemented a new program element, PDUs, as a means of accomplishing staff and student growth through the improvement of instructional practice. This report examined the effect of the PDU experience on the relevant practices, as well as related measures (e.g., student and employee growth). Our analysis indicated that many professionals have taken advantage of this program across time and have viewed it positively. Indeed, participation appeared to be related to several variables of interest (e.g., appraisal scores and instructional practices) for some within the same year of participation. These significant findings were largely unsupported, however, when a matching technique was employed controlling for the self-selected nature of PDU participation. Moreover, no significant differences in improvement between the year previous to participation, 2011–2012, and the year of participation, 2012–2013, were established between participants and non-participants with respect to the percentage of students meeting their SLO, appraisal points earned, peer observation scores, and data usage, across all levels. A significant difference was found between elementary school participants and their matched colleagues, though. Interestingly, when we analyzed the extent to which 2011–2012 PDU participants experienced both higher averages and improvements in subsequent years meaningful differences emerged. Elementary school participants were more likely than were matched non-participants to have a higher percentage of their students make their SLO, as well as more likely to report engaging in

reflective teaching in the year following participation. Similarly, elementary school participants grew more in using reflective teaching than did their matched colleagues.

Overall, it seems likely that although the program was popular and may have an effect on attitudes, the relationship with regard to behaviors was complicated. It could be unrealistic, however, to expect PDU participation to be consistently associated with broad outcomes, such as student growth, given the narrow focus of study topics. It seems more reasonable to expect participation to be related to outcomes connected to the topic of study. Indeed, when we examined the extent to which specific measures on the PDU grading rubric were related to relevant measures, such as student growth, significant relationships were established. This does not concretely answer whether PDU participation has a strong effect on student and staff growth, though. It merely demonstrates the ability of the grading rubric employed by the scoring panel to sufficiently discriminate teacher quality. It remains likely that the characteristics of the individuals who chose to participate in PDUs explained the relationship between participation and positive outcomes, such as higher levels of self-reported instructional practices, appraisal scores, and student growth. However, we were unable to unconditionally affirm the limited impact of the PDU experience, given that it may affect a narrower range of outcomes, reflected by the topic of study. Because we were unable to capture these metrics, the question of impact remains unresolved. It does appear that PDU participation had an effect, even if limited, in improving appraisal scores for elementary school teachers from the year previous to involvement, as well as affecting growth in reflective teaching practices and the percentage of students making an SLO in subsequent years for these same teachers.

Appendix A. Items on the Attitudes Toward Professional Development Units (PDUs), Data Use, Collaboration, and Reflective Teaching Scales

Scale	Item stem and response options	Item
Attitudes on professional development units (2013 PDU Survey)	The following items assess the extent to which the PDU experience achieved program goals. Please rate how strongly you agree or disagree with the following statements: (strongly agree, agree, disagree, strongly disagree)	I learned strategies through my PDU that have helped me refine my teaching.
		I understand my students' needs better now than I did before participating in a PDU.
		I have seen direct benefits to my students from my participation in a PDU.
		Participating in a PDU has helped me analyze my own instructional practices in new ways.
		Participating in a PDU has encouraged me to collaborate with other teachers to improve my teaching more than I did before.
Data use (2012 and 2013 TELL)	How frequently do you use data in the following ways? (once a year, once a semester, once every two months, once a month, twice a month, once a week)	Comparing test scores for your class across academic years (e.g., how 5th grade class as a whole performed in 3rd grade and 4th grade).
		Examining current benchmark scores to create classroom instructional groups.
		Examining data to identify students in need of intervention.
		Collaborating with other educators about data and how it relates to the learning needs of students.
Collaboration (2012 and 2013 TELL)	Indicate how much you agree or disagree with each statement. I participate with a group of my campus colleagues to: (strongly agree, agree, disagree, strongly disagree, don't know)	Analyze student performance data
		Discuss ways to meet objectives for specific students
		Plan lessons and units together
		Develop common student assessments
Collaboration (2012 and 2013 Employee Coordinated Survey)	How often does your department/ team: (frequently, often, sometimes, rarely, unsure/n/a)	Discuss your department/team's professional development needs and goals
		Discuss assessment data for individual students
		Set learning goals for groups of students
		Group students across classes based on learning needs
		Provide support for new teachers
		Provide support for struggling teachers
		Share instructional strategies
Reflective teaching (2012 and 2013 Employee Coordinated Survey)	How frequently do: (frequently, often, sometimes, rarely, unsure/n/a)	Reflections on your past teaching experiences influence your lesson plans?
		You seek out collaboration with other teachers to improve a lesson plan that did not go well?
		You work with other teachers to improve your teaching even when it is going well?
		You adjust your instructional strategies based on student assessment results?

Appendix B. Average Years of Experience, Percentage of Students Meeting a Student Learning Objective (SLO), Appraisal Points Earned, Educator Value-Added Assessment System (EVAAS), Student Growth Scores, Self-Reported Instructional Practice Scores, and Attitudes Toward the Profession for 2012–2013 Professional Development Unit (PDU) Participants and All Non-Participants

	Participants	All non-participants
Years teaching experience, 2011–2012	9.26 (*n* = 335)	9.99 (*n* = 1,792)
Percentage of students meeting SLO, 2011–2012	81%* (*n* = 165)	76% (*n* = 904)
Percentage of total points earned in appraisal system, 2011–2012	80% (*n* = 237)	79% (*n* = 1,078)
Reading/English language arts EVAAS score, 2011–2012	.32 (*n* = 44)	.46 (*n* = 146)
Math EVAAS score, 2011–2012	.57 (*n* = 35)	.18 (*n* = 131)
Data use, 2011–2012	3.82 (*n* = 132)	3.71 (*n* = 715)
Reflective teaching, 2011–2012	3.33 (*n* = 71)	3.23 (*n* = 367)
Collaboration, 2011–2012	2.89 (*n* = 71)	2.83 (*n* = 365)
Job satisfaction, 2011–2012	2.67 (n = 69)	2.66 (n = 365)
Attachment to profession, 2011–2012	3.39 (n = 238)	3.32 (n = 1,075)
Attachment to school, 2011–2012	3.11† (n = 237)	3.03 (n = 1,073)
Self-efficacy, 2011–2012	3.13* (n = 238)	3.05 (n = 1,072)

Source. REACH PDU database
†p <.10, *p <.05

Appendix C. Average Educator Value-Added Assessment System (EVAAS) Scores and Retention Rate for 2012–2013 Professional Development Unit (PDU) Elementary School Participants and Matched Non-Participants

	Participants	Matched non-participants
EVAAS reading/English language arts, 2012–2013	-.29 (*n* = 19)	-.13 (*n* = 18)
EVAAS math, 2012–2013	-.69 (*n* = 17)	-.40 (*n* = 17)
Retention rate	87% (*n* = 110)	87% (*n* = 111)

Source. REACH PDU database
†*p* <.10, **p* <.05

Appendix D1. Professional Development Unit (PDU) Grading Categories and Their Indicators

Grading category	Indicator	Indicator range Indicator average
Collaboration	Teamwork	1-4 3.46
	Presentation	1-4 3.39
Implementation/impact on instruction	Application of study	1-4 3.11
	Use of resources	1-4 3.27
	Teacher development	1-4 3.42
Impact on student learning	Student growth	2-8 5.61
	Data quality and use	1-4 3.03
Documentation/binder	PD/resources	1-4 3.28
	Meeting logs and time	1-4 3.25
	Individual reflections	1-4 3.19

Source. REACH PDU database

Appendix D2. Professional Development Unit (PDU) Grading Rubric for Impact on Student Learning

	Impact on student learning	
Score	Student growth (score x 2)	Data quality and use
1 Standards not observed	• Student artifacts/data either not presented or do not demonstrate improved student performance in the target area	• Data collected is not related to the study • No data collected by any member of the team • Data collected on isolated students only • Data was not used to examine effectiveness of strategies
2 Approaching standards	• Demonstrates limited student improvement with pre and post student data/artifacts which are **not** directly tied to the content studies by the PDU team (i.e., test scores only)	• Data collected is loosely connected to the study (i.e., test scores only) • At least one form of student data/artifacts collected by all members of the team • Data on small student groups • Data was used to determine effectiveness, but did not drive changes in instruction
3 Meeting standards	• Demonstrates clear student improvement using multiple measures with pre and post student data/artifacts which are related to the content studied by the PDU team	• Data collected shows a correlations between results and the content of the study • At least two forms of student data collected and presented by all members of the team • Data presented from large student populations (at lease one class for each member of the team) • Data drove changes to instruction
4 Exceeding standards	• Demonstrates outstanding student improvement using multiple measures with pre and post student data/artifact which are directly connected to the content studies by the PDU team	• Data collected demonstrates causation between student growth and the study (i.e., using scientific methods such as control groups and controlling for variables • Three or more forms of student data/ artifacts collected and presented by all members of the team • Data/artifacts presented from at least one entire class from each teacher in the study • Data drove repeated changes to instruction

Source. REACH website.

For the complete grading rubric see the following link:
http://www.austinisd.org/sites/default/files/dept/reach/docs/SCI_PDU_Rubric_2012-13.pdf

Appendix D3. Relationship Between Professional Development Unit (PDU) Grading Metrics and Science Educator Value-Added Assessment System (EVAAS) scores, the Percentage of Students Meeting a Student Learning Objective (SLO), Appraisal Scores and Engagement in Instructional Practices

	Impact on student learning			Implementation/ impact on instruction			
	Student growth	Data quality use	Impact on student learning scale	Application of study	Use of resources	Teacher development	Impact on instruction scale
Science EVAAS, 2012–2013	-.03 (*n* = 20)	-.08 (*n* = 20)	-.05 (*n* = 20)	.12 (*n* = 20)	.002 (*n* = 20)	.01 (*n* = 20)	.06 (*n* = 20)
Percentage of students meeting SLO, 2012–2013	.02[a] (*n* = 339)	.03 (*n* = 339)	.03 (*n* = 339)	-.003 (*n* = 339)	-.001 (*n* = 339)	.02 (*n* = 339)	.004 (*n* = 339)
Percentage of total points earned in appraisal system, 2012–2013	-.05 (*n* = 250)	-.03 (*n* = 250)	-.05 (*n* = 250)	-.09 (*n* = 250)	-.03 (*n* = 250)	-.01 (*n* = 250)	-.05 (*n* = 250)
Data use, 2012–2013	-.01 (*n* = 272)	-.03 (*n* = 272)	-.02 (*n* = 272)	.01 (*n* = 272)	-.04 (*n* = 272)	-.07 (*n* = 272)	-.04 (*n* = 272)
Reflective teaching, 2012–2013	.07 (*n* = 81)	.07 (*n* = 81)	.07 (*n* = 81)	.01 (*n* = 81)	.08 (*n* = 81)	.11 (*n* = 81)	.07 (*n* = 81)
Collaboration, 2012–2013	-.001 (*n* = 81)	-.08 (*n* = 81)	-.03 (*n* = 81)	.03 (*n* = 81)	.14 (*n* = 81)	-.04 (*n* = 81)	.04 (*n* = 81)

Source. REACH PDU database

[a] The *n* count differs from earlier in the report (*n* = 335) because a few teachers participated in more than one PDU and thus had more than one set of scores.

Appendix E. Sample Size Information for Figure 7

	Participation status	Elementary school	Middle school	High school
Data use	Participant	*n* = 185	*n* = 27	*n* = 56
	Non-participant	*n* = 759	*n* = 163	*n* = 421
Collaboration	Participant	*n* = 183	*n* = 27	*n* = 54
	Non-participant	*n* = 764	*n* = 165	*n* = 421
Reflective teaching	Participant	*n* = 61	*n* = 6	*n* = 14
	Non-participant	*n* = 228	*n* = 55	*n* = 171

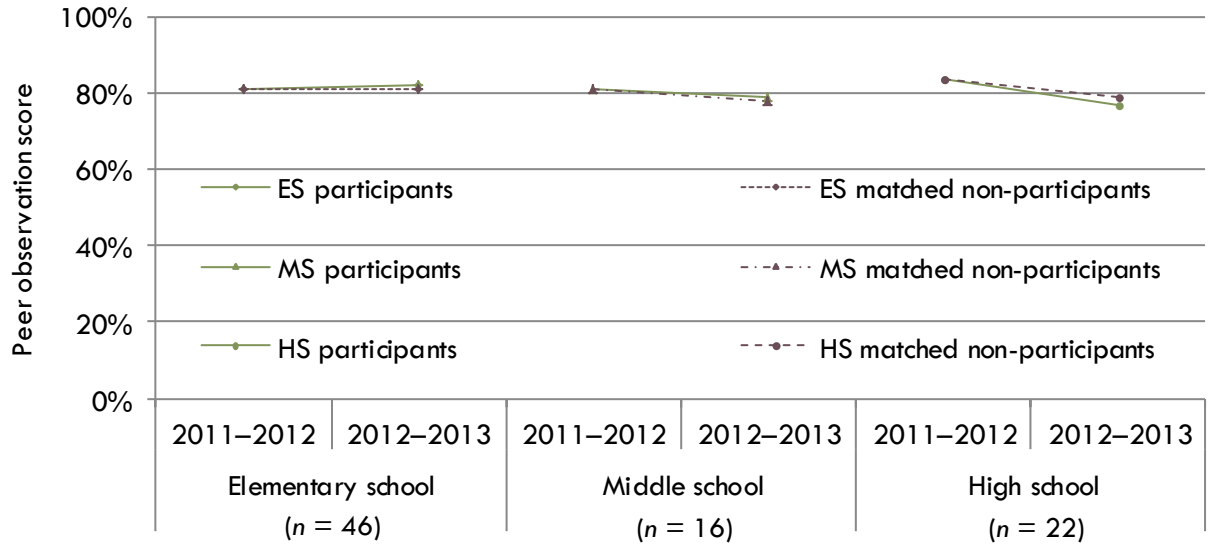
Source. REACH PDU database

Appendix F. Average Change From 2011–2012 to 2012–2013 for 2012–2013 Professional Development Unit (PDU) Participants and Non-Participants at the Elementary School Level

	Participants	Non-participants
EVAAS reading/English language arts change, 2011–2012 to 2012–2013	-1.07 (*n* = 24)	-0.79 (*n* = 66)
EVAAS math change, 2011–2012 to 2012–2013	-1.45 (*n* = 21)	-1.02 (*n* = 59)
Collaboration change, 2011–2012 to 2012–2013	-.32 (*n* = 25)	-.17 (*n* = 84)
Reflective teaching change, 2011–2012 to 2012–2013	-.07 (*n* = 25)	-.08 (*n* = 85)

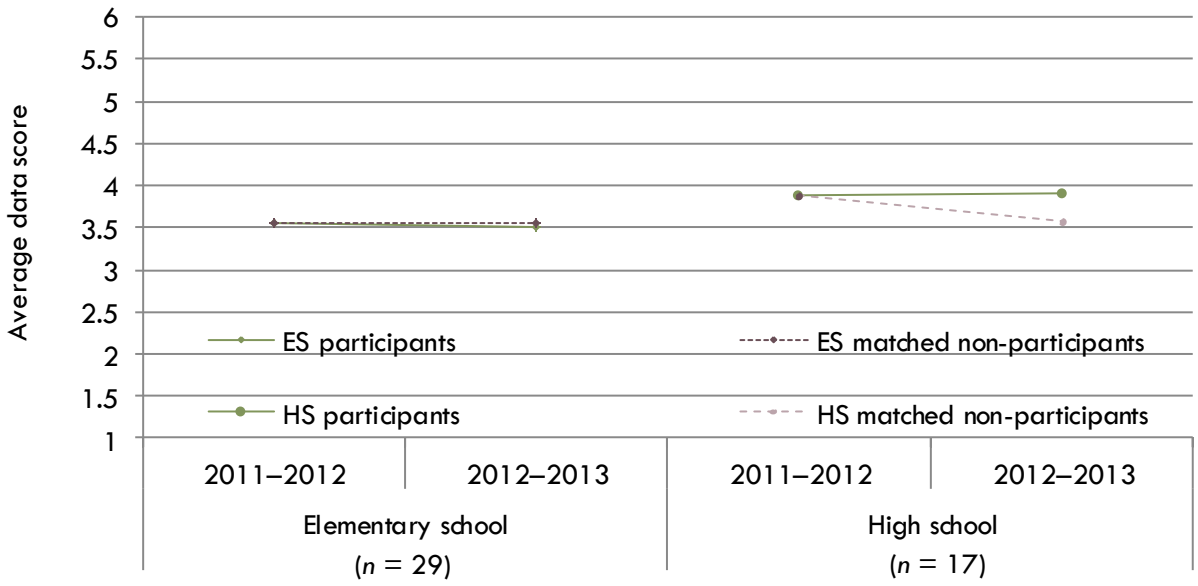
Source. REACH PDU database
†*p* <.10, **p* <.05

Appendix G1. Improvements in Peer Observation Scores for 2012–2013 Participants and Their Matched Colleagues



Source. REACH PDU database
†*p* <.10, **p* <.05

Appendix G2. Improvements in Data Use From 2011–2012 to 2012–2013 for 2012–2013 Professional Development Unit (PDU) Elementary School Participants and Their Matched Colleagues



Source. REACH PDU database
† p <.10, *p <.05

Appendix G3. Improvements in Educator Value-Added Assessment System (EVAAS) Scores for 2012–2013 Elementary School Teacher Participants and Their Matched Colleagues

	2011–2012		2012–2013		Change between 2011–2012 and 2012–2013	
	Participants	Non-participants	Participants	Non-participants	Participants	Non-participants
EVAAS reading/ English language arts	.54 (*n* = 24)	.54 (*n* = 24)	-.29 (*n* = 19)	-.13 (**n** = 18)	-.94 (*n* = 19)	-.65 (*n* = 18)
EVAAS math	.48 (*n* = 25)	.45 (*n* = 25)	-.69 (*n* = 17)	-.40 (*n* = 17)	-1.31 (*n* = 17)	-.85 (*n* = 17)

Source. REACH PDU database
† p <.10, *p <.05

Appendix H1. Averages and Improvements Between 2011–2012 and 2012–2013 for 2011–2012 Professional Development Unit (PDU) Participants and Non-Participants

		2012–2013		Change between 2011–2012 and 2012–2013	
		Participants	Non-participants	Participants	Non-participants
Percentage of students meeting SLO	Elementary school	87%† (*n* = 49)	83% (*n* = 370)	-.53 (*n* = 49)	2.48 (*n* = 366)
	High school	77% (n = 12)	75% (*n* = 321)	-1.82 (*n* = 11)	4.96 (*n* = 317)
Percentage of total points earned in appraisal system	Elementary school	80% (*n* = 39)	80% (*n* = 334)	-4.30* (*n* = 37)	-.39 (*n* = 308)
Peer observation score	Elementary school	81% (*n* = 48)	80% (*n* = 358)	-.81 (*n* = 48)	-.43 (*n* = 355)
	Middle school	78% (*n* = 10)	77% (*n* = 111)	-2.71 (*n* = 10)	-2.58 (*n* = 108)
	High school	78% (*n* = 13)	80% (*n* = 317)	-9.29* (*n* = 13)	-4.32 (*n* = 307)

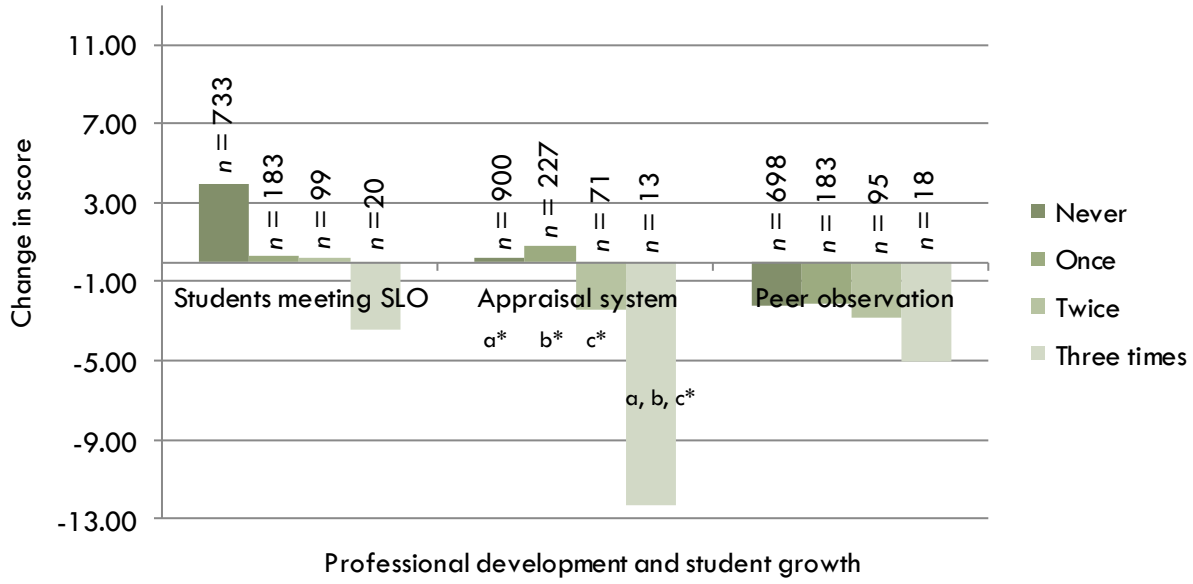
Source. REACH PDU database
Note. Analyses were limited across school levels due to sample size issues. SLO is student learning objective
† $p < .10$, *$p < .05$

Appendix H2. Implementation of Changes to Instructional Practices for 2011–2012 Professional Development Unit (PDU) Participants and Non-Participants

		2012–2013		Change between 2011–2012 and 2012–2013	
		Participants	Non-participants	Participants	Non-participants
Data use	Elementary school	3.59 (*n* = 40)	3.61 (*n* = 332)	-.25 (*n* = 34)	.21 (*n* = 290)
	High school	3.18 (*n* = 11)	3.53 (*n* = 277)	-.43 (*n* = 11)	-.01 (*n* = 220)
Reflective teaching	Elementary school	3.65* (*n* = 18)	3.35 (*n* = 94)	.09 (*n* = 11)	-.13 (*n* = 50)
Collaboration	Elementary school	3.22* (*n* = 18)	2.85 (*n* = 93)	-.10 (*n* = 11)	-.34 (*n* = 49)

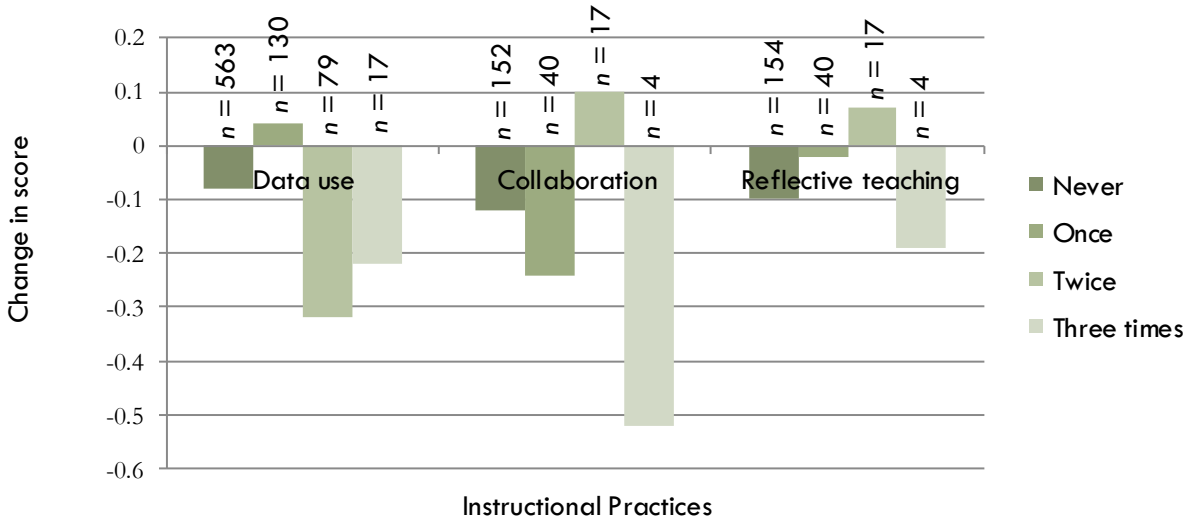
Source. REACH PDU database
†$p < .10$, *$p < .05$
Note. Analyses were limited across school levels due to sample size issues.

Figure I1. The Influence of Repeated Professional Development Unit (PDU) Participation on Improvements in the Percentage of Students Meeting Their SLO, Appraisal System Scores, and Student Growth



Source. REACH PDU database
†*p* <.10, **p* <.05
Note. Letters indicate statistical test comparison groups within a category. For example, a indicates that a statistically significant relationship was found between those who never participated and those who participated three times for appraisal scores.

Figure I2. The Influence of Repeated Professional Development Unit (PDU) Participation on Improvements in Instructional Practices



Source. REACH PDU database
†*p* <.10, **p* <.05

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