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How Do Teachers Spend Professional Learning Time, and Does It Connect to Classroom Practice?

Findings from the 2022 American Instructional Resources Survey

Over the past several years, K–12 teachers in the United States have increasingly had more access to instructional materials aligned with their academic standards. As of the 2020–2021 school year, according to data from the American Instructional Resources Survey (AIRS), 42 percent and 26 percent of math and English language arts (ELA) teachers, respectively, indicated that they used, at least weekly, one or more core curriculum materials that were rated as standards-aligned by EdReports.¹ These rates of use represent 8-percentage-point and 9-percentage-point increases for math and ELA, respectively, since the first year of the AIRS in 2019. However, teachers’ primary use of standards-aligned material lags behind the adoption of the materials within schools and districts: Just 31 percent of math teachers and 17 percent of ELA teachers reported using standards-aligned material for the majority of their classroom instruction time (Doan, Kaufman, et al., 2022).

Professional learning (PL) opportunities could be a valuable tool for supporting teachers in using standards-aligned curriculum materials more frequently and more productively, among other aims. Prior research that used data from the AIRS found that teachers who reported frequent participation in curriculum-aligned collaborative learning or coaching (*frequent participation* was defined as participating four or more times per year) were significantly more likely than their peers to regularly use standards-aligned instructional materials. Although this research does not causally link PL to

KEY FINDINGS

- The most common mode of PL among teachers was collaborative learning, compared with workshops or trainings and coaching.
- Teachers most commonly spent PL time supporting their use of curriculum materials or analyzing student assessment data.
- Teachers in classrooms that predominantly include English learners (ELs), economically disadvantaged students, or students who were Black or Latino were more likely to frequently participate in PL.
- More than half of teachers expressed that their professional learning opportunities provided low access to expertise on subject matter knowledge, supporting ELs and students with individualized educational plans (IEPs) or 504 plans, and using required curriculum materials.
- Teacher perceptions of the benefits of PL were positively linked to the time that they spent participating in PL and the extent to which they reported having access to expertise through their PL.
- Participation in PL appears to increase the frequency with which teachers report using standards-aligned practices in their classroom, although there are differences in use of practices by subject level and the type of PL.
- Participation in PL was not significantly linked to higher student achievement as measured by both teacher reports of their students' performance and the percentage of students who regularly complete their classroom assignments.

instructional-material use or other outcomes, it does present evidence suggesting that curriculum-aligned supports are intertwined with more frequent curriculum use. Furthermore, a broad body of research, much of which is summarized in Garrett, Zhang, Citkowitz, and Burr (2021), indicates that teacher participation in PL is linked to sizable improvements in both teacher practice and student achievement.

In this report, we use data from the AIRS fielded in spring 2022 to K–12 math, ELA, and science teachers to describe teachers' PL activity, with an emphasis on how much PL time was spent on various topics and activities. Although the focus of the AIRS, and thus the items on PL that we analyze, is largely on using, adapting, and creating instructional materials, the

2022 AIRS also asked teachers whether PL time was spent on various topics, including classroom management and supporting student mental health. This allows us to describe a broader variety of teacher PL activity. We also examine the extent to which teacher participation in PL translates to instructional efficacy, as measured by teacher reports of standards-aligned classroom practices and teacher-reported estimates of student achievement relative to grade level. Specifically, we ask the following research questions:

- What types of PL do teachers engage in?
- How do teachers spend their time during their PL experiences?
- How do teachers benefit from their PL experiences?
- How does PL connect to instructional efficacy as measured by teacher-reported classroom practices and student achievement?

Overall, we find that:

- Across the three types of PL that teachers were asked about in the AIRS (workshops or trainings, coaching, and collaborative learning, which we describe in detail in Box 1), teachers

Abbreviations

AIRS	American Instructional Resources Survey
EL	English learners
ELA	English language arts
FRPL	free or reduced-price lunch
IEP	individualized educational plan
PL	professional learning

Box 1. The Types of PL That We Examine in This Report

In the AIRS, *PL* was defined for teachers as “the supports you receive, whether in-person or virtually, to improve your teaching practice and knowledge.” The AIRS specifically asks teachers about their participation in three types of PL: (1) “professional development workshops or trainings;” (2) “coaching;” and (3) “collaborative learning with other teachers (e.g., Professional Learning Communities), including instructional planning time.” Although we did not provide comprehensive definitions for each type of PL within the survey beyond what is in quotations, our definitions of these types, as used in this report, align with the definitions provided by the Council of Chief State School Officers (2023). *Workshops or trainings* refer to learning experiences, typically offered by third-party providers outside the classroom, to teach educators about specific resources, materials, or instructional strategies. *Coaching* refers to opportunities teachers have to be observed by experts (for example, master teachers, department leads, school administrators) and provided feedback on the basis of the observed lessons. *Collaborative learning* with other teachers refers to opportunities, such as instructional planning time or professional learning communities, for teachers to work with teams of other teachers grouped by content area or grade level to address shared problems of practice. Because these definitions were not provided to teachers, we cannot know whether they interpreted these opportunities in the same way that we define them here.

most frequently participated in collaborative learning.

- Teachers were most likely to indicate that collaborative learning benefited their teaching and student learning.
- Teachers’ perceptions of the effectiveness of PL were strongly linked to the frequency of their participation and the extent to which they reported having access to expertise through that type of PL.
- Teachers who more frequently participated in PL were more likely to report higher levels of standards-aligned classroom practices. The only exception to this rule was that among ELA teachers who reported more frequent participation in collaborative learning, participation was not significantly associated with lower or higher levels of standards-aligned classroom practices.

We present key findings for each research question throughout this report and conclude with implications for policymakers based on our findings.

Findings

What Types of Professional Learning Do Teachers Engage In?

We asked teachers to report the frequency with which they participated in three broad types of PL that are

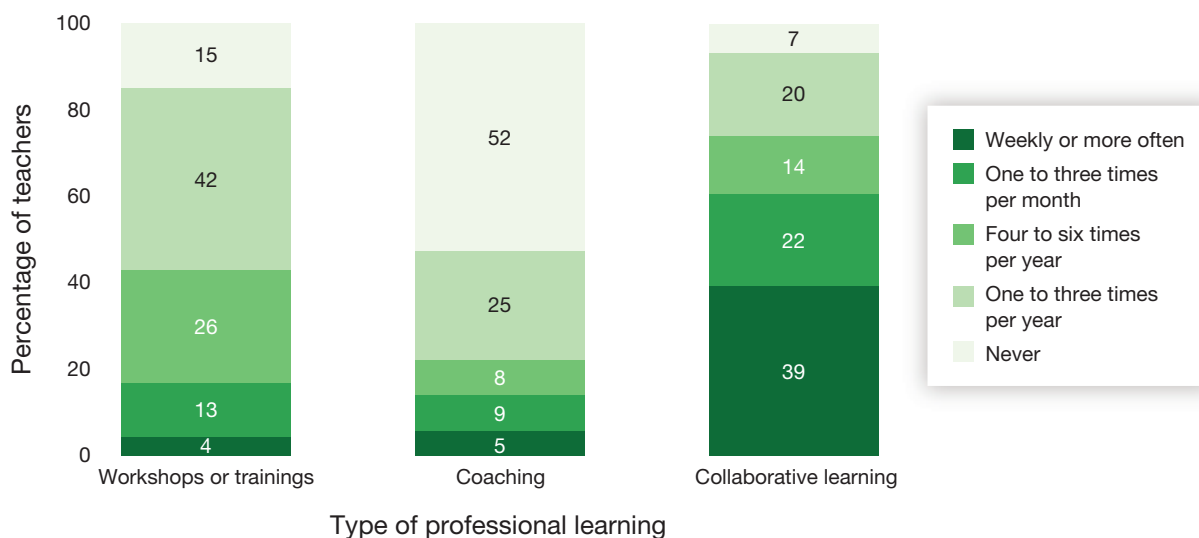
intended to improve teaching practice and knowledge: (1) workshops or trainings, (2) coaching, or (3) collaborative learning with other teachers. *Collaborative learning*, as defined in the survey, could include activities such as PL communities or instructional planning time. Teachers’ participation in each type of PL could be on any topic (e.g., use of instructional materials, classroom management, or analysis of student assessments) with an exploration of specific topics provided within our analysis of how teachers spend their time during their PL experiences.

Among the Three Types of Professional Learning, Teachers Most Frequently Participated in Collaborative Learning

Figure 1 presents the frequency with which teachers reported participating in each of these three types of PL, ranging from “Never” to “Weekly or more often.” Following conventions from prior AIRS reporting in which teachers who participated in any type of PL at least “4–6 times per year” were classified as *frequent participators*, we find that teachers were most likely to report being frequent participators in collaborative learning than in the other two types of PL. Nearly three-quarters of teachers indicated frequently participating in collaborative learning, which far exceeds rates of frequent participation in workshops or trainings (43 percent of teachers) or coaching (23 percent). Of note, more than half of teachers (52 percent) indicated that they did not participate in any coaching

FIGURE 1

Frequency of Teacher Participation in Different Types of Professional Learning



NOTE: $N = 7,760$. This figure is based on the following survey item: “This school year (2021–2022), how often have you participated in the following types of activities intended to support your [ELA/mathematics/science] instruction?”

during the 2021–2022 school year. The prevalence of collaborative learning, relative to workshops or trainings and coaching, should not be taken solely by itself as an indication of teachers’ preference for this form of PL. Collaborative learning has various structural advantages that lend to more frequent participation from teachers. For example, collaborative learning, as defined in this report, requires coordination only with peers within a teacher’s school and could be inclusive of such standard practices as instructional planning time. Workshops or trainings and coaching, on the other hand, often require coordination with parties outside teachers’ immediate schools and might incur financial costs. Both factors could reduce the frequency with which schools and districts could provide each form of professional learning.

Science Teachers and Teachers in Schools That Serve Low Percentages of ELs or Students Who Are Economically Disadvantaged Were Least Likely to Frequently Participate in PL

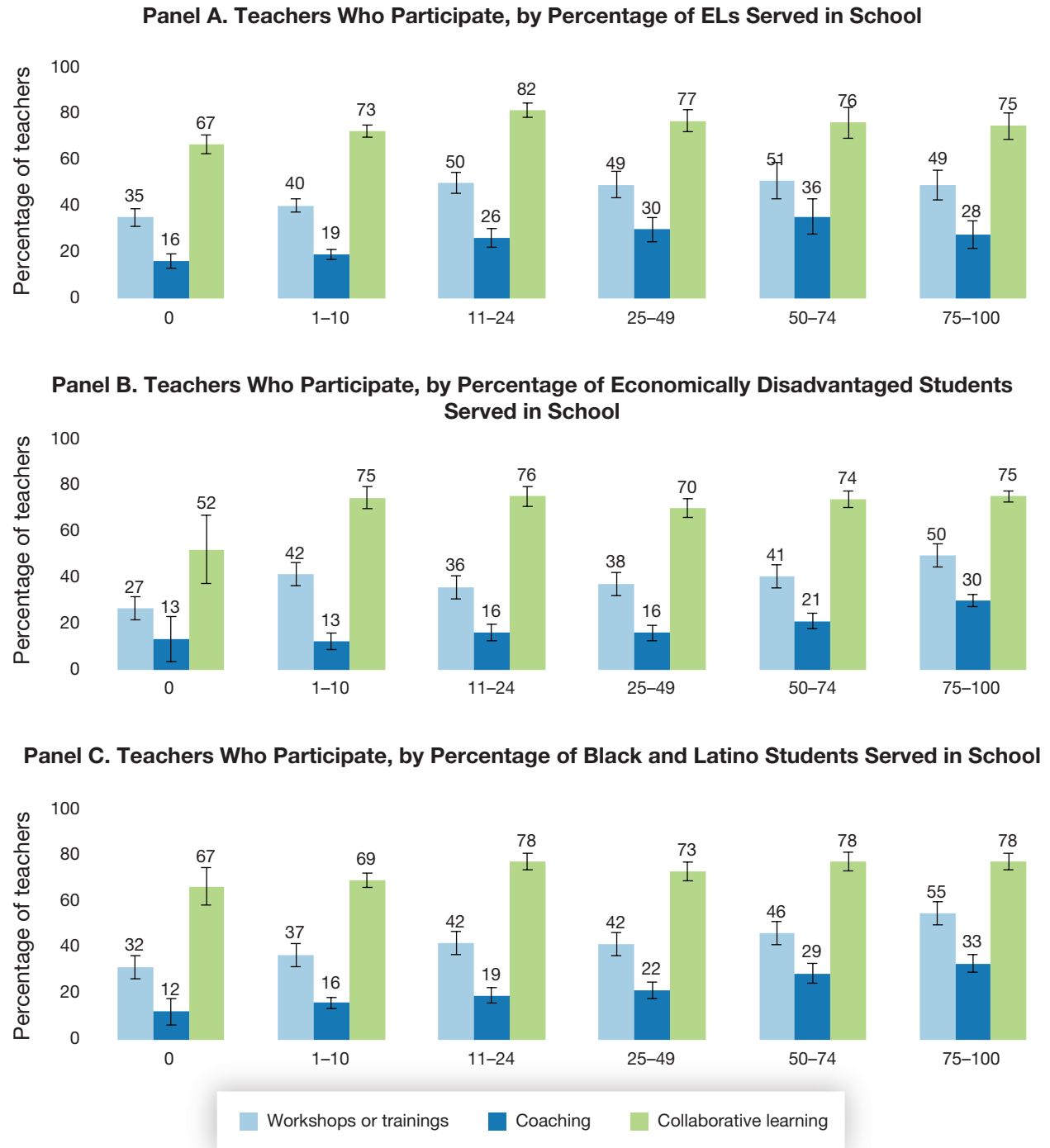
We next examined how rates of PL participation differed by teacher and school characteristics. Echoing research using previous versions of the AIRS

(Doan and Lucero, 2021), we find that teachers were significantly less likely to frequently participate in PL that supports science instruction than they were to participate in PL that supports ELA or math instruction. Just 35 percent of teachers reported frequently participating in workshops or trainings that support science instruction, compared with 51 percent and 40 percent of teachers who indicate that they frequently participate in workshops or trainings to support ELA or math instruction, respectively. One important caveat to note is that these findings do not necessarily indicate that teachers are more reluctant to participate in PL that is centered on science instruction; it might be the case that there are fewer PL opportunities available for science instruction. We find similar patterns by teacher subject assignment for coaching and collaborative learning.

Teachers also differed in PL participation rates by their self-reported classroom composition, as shown in Figure 2. We found that teachers who served low concentrations of ELs, students identified as economically disadvantaged, or students identified as Black or Latino were significantly less likely to be frequent participators in all three types of PL.² For example, although roughly 75 percent of teachers who serve economically disadvantaged students reported that

FIGURE 2

Teachers Who Participate in Each Type of PL at Least “4–6 Times per Year”



NOTE: $N = 7,760$. This figure is based on the following survey items: (1) “This school year (2021–2022), how often have you participated in the following types of activities intended to support your [ELA/mathematics/science] instruction?” (2) “Approximately what percentage of the students you teach—including those in small push-in or pull-out groups—are English learners?” (3) “Approximately what percentage of the students you teach are eligible to receive free or reduced-price meals (FRPL)?” and (4) “Approximately what percentage of the students you teach are Black or Latino?”

they frequently participate in collaborative learning, just 52 percent of teachers who do not serve economically disadvantaged students were frequent participants. Similarly, teachers with no ELs or Black or Latino students in their classrooms had the lowest rates of frequent participation across all three types of PL relative to teachers serving at least some of these students. We encourage caution around these patterns because the groupings (0 percent, 1–10 percent, 11–24 percent) that were provided to survey respondents are quite broad and, particularly in the case of student race and ethnicity, respondents might not have access to confirmatory data on how students in their classroom identify. This might have led to high rates of misclassification by respondents.

How Do Teachers Spend Their Time During Their PL Experiences?

Teachers Most Frequently Spent PL Time on Use, Adaption, or Analysis of Curriculum Materials and Student Assessments

Teachers were also asked to break down how they spent their time while participating in PL activities. Teachers who participated in PL at least once during

Teachers were most likely to report that analyzing and using student assessments and using or adapting curriculum materials occupied substantial portions of their PL time.

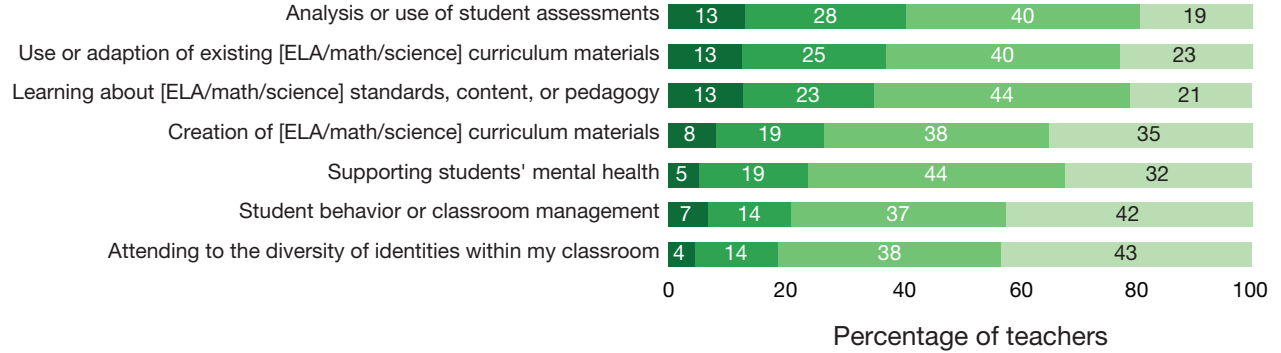
the year were asked to estimate the percentage of time that they spent on specific activities during that period of PL. As a note, teachers reported their time in broad bins (“No Time,” “1–25%,” “26–50%,” and “More than 50% of time”), and there was no strict requirement that the time teachers reported spending across activities within a given type of PL summed to 100. Therefore, it is best to interpret these data as teachers’ reports on which activities they spent relatively more or less time doing rather than strict accounts of how much time was spent on various activities.

Collaborative learning likely affords teachers and their peers a great amount of autonomy to decide the topics they discuss. In responses to the 2021 AIRS, a majority of teachers indicated that more than half of the activities they did during collaborative learning time were decided by the teachers participating in that collaborative learning (Doan et al., 2021); we did not ask parallel questions for other types of PL. Thus, by honing in on what teachers report doing during their collaborative learning time, we might gain a clearer picture of what teachers think are the most useful topics to address in their PL. Teachers were most likely to report that (1) analyzing and using student assessments and (2) using or adapting curriculum materials occupied substantial portions of their PL time for both workshops or trainings and collaborative learning, as shown in Figure 3. Forty-one percent and 38 percent of teachers indicated that at least one-quarter of their time during workshops or trainings was spent analyzing and using student assessments and using or adapting curriculum materials, respectively. These activities were the most common uses of collaborative learning time as well; 46 percent of teachers indicated spending at least one-quarter of their time on analyzing and using assessments, and 48 percent of teachers indicated spending at least one-quarter of their time using or adapting curriculum materials. Creating new materials and learning about standards and pedagogy were the third and fourth most common uses of time during workshops or trainings and collaborative learning after these two activities. Of the activities we asked teachers to report on during workshops and trainings, and collaborative learning, teachers were least likely to report that they spend time “attending

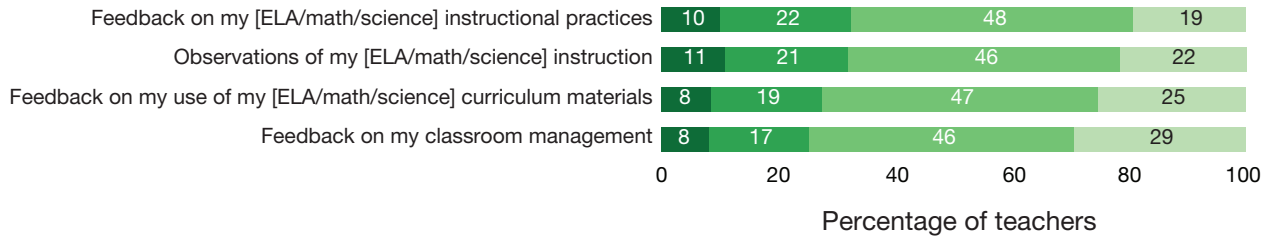
FIGURE 3

Proportion of Time That Teachers Reported They Devote to Particular Topics During PL Opportunities, by Type of PL

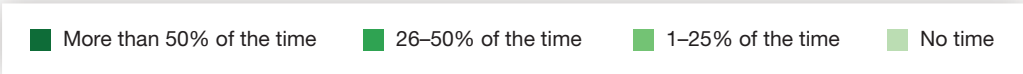
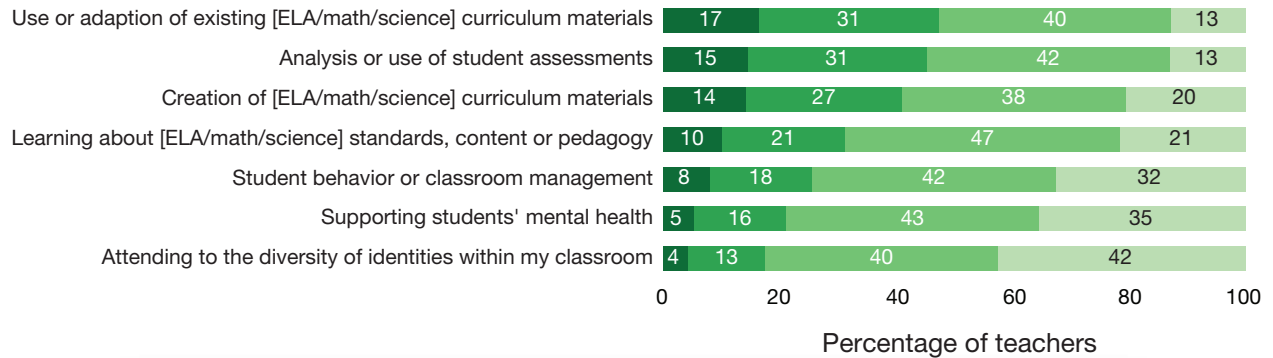
Panel A. Use of Time During Workshops or Trainings



Panel B. Use of Time During Coaching



Panel C. Use of Time During Collaborative Learning



NOTE: $N = 7,760$. This figure is based on the following survey items: (1) "For the [professional development workshops or trainings/coaching/collaborative learning] in which you have participated to support your [ELA/math/science] instruction this school year (2021-22), what approximate proportion of that time has been spent on each of the following activities." Teachers were asked to approximate their time spent on each activity using broad time bands ("no time," "1-25% of the time," "25-50% of the time," and "more than 50% of the time"). Therefore teachers' responses across time activities will not sum to 100. The activities asked about with regard to teachers' coaching time are distinct from the activities asked about with regard to workshops or trainings and collaborative learning time because of the emphasis on classroom observation and individualized feedback, which are activities that are distinct to coaching opportunities.

to the diversity of identities within my classroom.” More than 40 percent of teachers that participate in either type of PL reported spending “no time” on such activities.³

For coaching, time use was relatively equally spread across the four activities; teachers were slightly more likely to report spending coaching time on receiving feedback on instructional practice and observations of instructional practice than they were to report receiving feedback on their use of curriculum materials and classroom management.

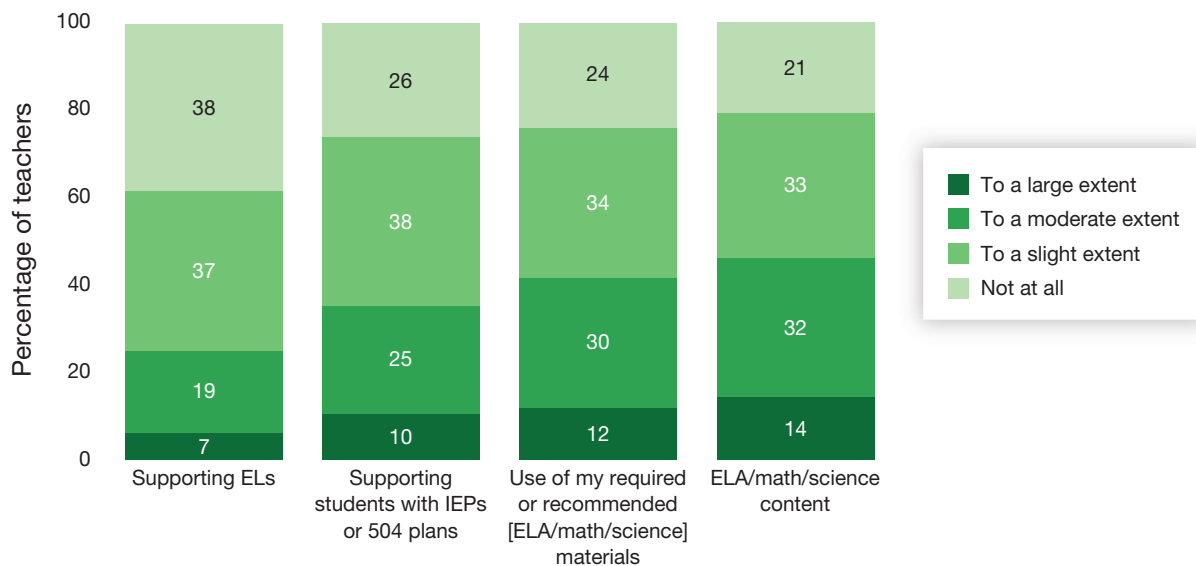
Teachers Reported Low Access to Expertise Through PL Opportunities

Figure 4 depicts the extent to which teachers felt that they could access four categories of expertise through their PL opportunities: (1) supporting ELs, (2) supporting students with IEPs or 504 plans, (3) effectively using required instructional materials, and (4) improving subject matter mastery. We refer to teachers who indicated that they access to a “large” or “moderate” amount of expertise as having “substantial access” to expertise in that area.

More than 40 percent of teachers reported having substantial access to expertise on subject-area content and the use of their required materials during their PL. Comparatively, only 26 percent and 35 percent of teachers reported that they have substantial access to expertise on supporting ELs and students with IEPs or 504 plans through their PL, respectively; the rates of teachers reporting substantial expertise for supporting ELs and students with IEPs or 504 plans increase to 40 percent and 39 percent, respectively, when we omit teachers who did not report teaching any students in these subgroups.

It is perhaps more concerning that a considerable percentage of teachers reported having no access to expertise on a particular topic. More than one-fifth of teachers indicated that they did not have any access to expertise on subject-matter content; these rates are particularly high among science teachers (37 percent) relative to ELA (19 percent) and math teachers (19 percent). Figure 5 shows that 38 percent of teachers (or 30 percent of teachers teaching at least one EL) reported that they have no access to expertise on supporting ELs.

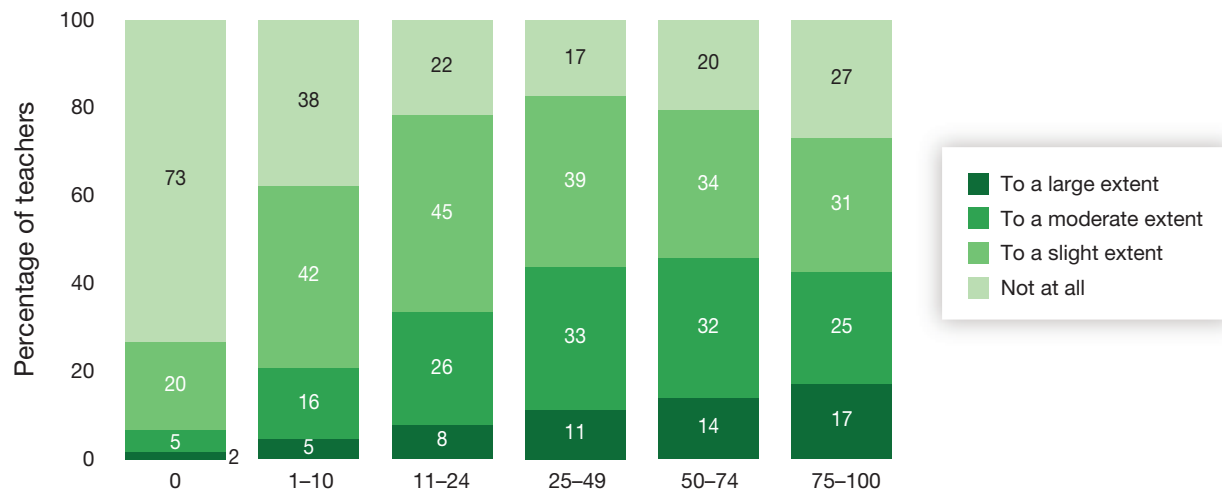
FIGURE 4
Extent to Which Teachers Reported Access to Categories of Expertise Through PL



NOTE: N = 7,760. This figure is based on the following survey item: “To what extent have you had access to expertise from others in the following areas for the PL and instructional planning activities in which you have participated this school year to support your [ELA/math/science] instruction?”

FIGURE 5

Extent to Which Teachers Reported Access to Expertise for Supporting English Learners, by Percentage of EL Students Served in Their School



NOTE: $N = 7,760$. This figure is based on the following survey item: “To what extent have you had access to expertise from others in the following areas for the PL and instructional planning activities in which you have participated this school year to support your [ELA/math/science] instruction?”

How Much Did Teachers Perceive That They Benefited from Their PL Experiences?

Teachers Were Most Likely to Report That Collaborative Learning Benefits Their Teaching and Student Learning

The AIRS also asked teachers to indicate the extent to which they felt that each type of PL helped improve their “teaching or student learning.” As shown in Figure 6, teachers were most likely to report that collaborative learning improved their teaching or student learning to a large extent (31 percent of participating teachers). The share of teachers who indicated that collaborative learning improved their teaching and student learning to a large extent was three times as large as the shares of teachers indicating the same for their coaching (11 percent) and workshops or trainings (11 percent). This difference is particularly significant given that teachers were also far more likely to participate in collaborative learning than they were to participate in the other two modes of PL. Several factors could explain teachers’ favorable perceptions of collaborative learning. First, collaborative learning structures might build on existing trust between teachers that could help participants more

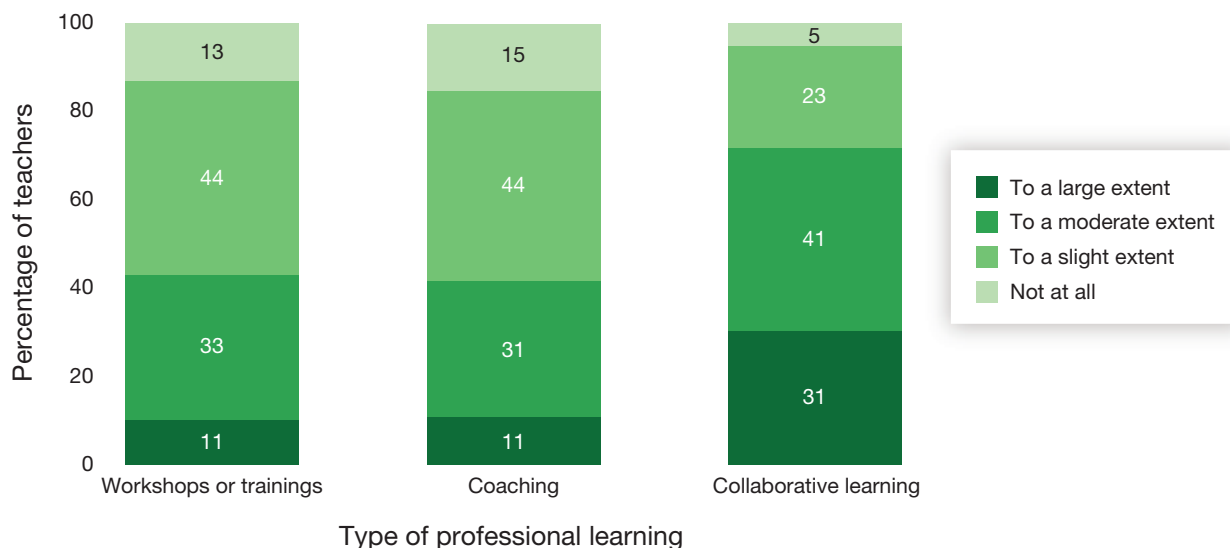
readily adopt the suggestions that emerge from collaborative learning sessions (Harris, 2011). Second, the autonomy over topics to be discussed combined with the high frequency of participation might be factors in explaining teachers’ favorable perceptions of collaborative learning. However, it is also possible that because teachers themselves, along with their immediate peers, are responsible for choosing many of the activities that occur during collaborative learning, they might be predisposed to perceiving this form of PL favorably regardless of the actual efficacy of collaborative learning.

Teachers Who Reported More-Frequent Participation in PL and Greater Access to Expertise Through Their PL Were More Likely to Deem It Effective

Unsurprisingly, teachers who participated more frequently in a type of PL were more likely to report that they thought that PL was effective. For example, teachers who reported participating in coaching weekly or more often were more than twice as likely to report that coaching improved their teaching or student learning to a moderate or great extent compared with teachers who reported participating one to three times per year (64 percent versus 29 percent).

FIGURE 6

Percentage of Teachers Reporting Extent to Which Each PL Type Improved Teaching or Student Learning



NOTE: $N = 7,760$. This figure is based on the following survey item: “To what extent has each activity in which you have participated to support your instruction improved your teaching or student learning in [ELA/math/science]?”

Similarly, the likelihood of a teacher indicating that workshops or collaborative learning were effective increased monotonically with the frequency of their participation. Because collaborative learning was the most common form of PL, this finding contributes to the high rates of teachers’ positive experiences with collaborative learning shown in Figure 6.⁴

Access to expertise on subject-area content and instructional materials was another key driver of whether teachers felt that their PL was effective for improving either student learning or their teaching. Teachers who indicated that they had access to expertise on the use of subject-area instructional materials during PL “to a large extent” were between 38 percentage points to 48 percentage points more likely to indicate that they felt that their PL improved their teaching or student learning compared with those who reported no access to expertise.

How Does PL Connect to Instructional Efficacy as Measured by Teacher-Reported Classroom Practices and Student Achievement?

We next examine how mode and frequency of PL correlates with instructional efficacy. We focus on two specific dimensions of instructional efficacy: use of standards-aligned classroom practices and student achievement. To quantify the extent to which teachers employ standards-aligned classroom practices, we created an index that summarizes teachers’ use of 10 to 15 standards-aligned practices in their most recent lessons. These standards-aligned instructional practices have been used in numerous American Educator Panel surveys from 2015 to 2017 to understand the implementation of college and career-ready standards. These items were adapted from surveys originally developed by Student Achievement Partners to measure teachers’ engagement with the instructional shifts that are required to implement more rigorous standards (Student Achievement Partners, undated-a; Student Achievement Partners, undated-b); the items were then pilot-tested with a small number of teachers and refined according to areas of confusion or

uncertainty for those teachers.⁵ To quantify student achievement, we created an achievement index using a survey item asking teachers to estimate whether the “average” achievement of their students was below, at, or above grade level in ELA and math.

In the following exploratory analysis, we link each of these measures to the frequency with which teachers participated in different forms of PL, controlling for a wide variety of teacher, classroom, and school characteristics. We caveat that teachers’ self-reported estimates of instructional efficacy might not reflect actual instructional efficacy and that our constructed indices are not intended to serve as a definitive, validated measure that reflects actual classroom practice. We further caveat that the relationships we document reflect correlations—not causal relationships—and that the controls we use are not exhaustive in capturing potential confounders. Finally, we note that the AIRS did not ask science teachers to complete these survey items; we therefore focus on math and ELA teachers.

Teachers Who Frequently Participated in PL Were More Likely to Report Using Standards-Aligned Instructional Practices in the Classroom Than Were Nonparticipants

We first link PL to an index that captures the regularity with which teachers used standard-aligned practices in their lessons. Box 2 provides a detailed explanation of the construction of this index. Teachers were presented with a list of standards-aligned practices and were asked how often they used these

practices in their five most recent lessons at the date of the survey. We summarized teachers’ responses into a grade- and subject-specific index standardized to mean 0 and standard deviation 1. A score of 1 indicates that a teacher scored one standard deviation higher on the index than the average teacher who teaches within the same grade category.

Using this index as the outcome of interest, we ran a regression that estimated the correlation between standards-aligned classroom practices and participation in PL. To account for teacher characteristics and classroom or school composition, which could confound this relationship, we included controls for grade category (elementary, middle, or high), years of teaching experience, master’s degree attainment, school locale, and the estimated percentage of the teacher’s students who were ELs, Black or Latino, eligible for FRPL, or on IEPs. To account for the fact that participation in one form of PL could be positively correlated with participation in other forms of PL, our regression simultaneously includes all three modes of PL (workshops or training, coaching, and collaborative learning) at each level of involvement (never, one to two times per year, four to six times per year, one to three times per month, weekly or more).⁶

Figure 7 depicts how teachers performed on the classroom practices index for each mode of PL, relative to teachers who did not participate in that mode of PL. Bars in which the standard errors do not cross zero indicate that PL at a given frequency is significantly different from having no PL.

The top panel of Figure 7 presents estimates for math classroom practices. Again, we focus on

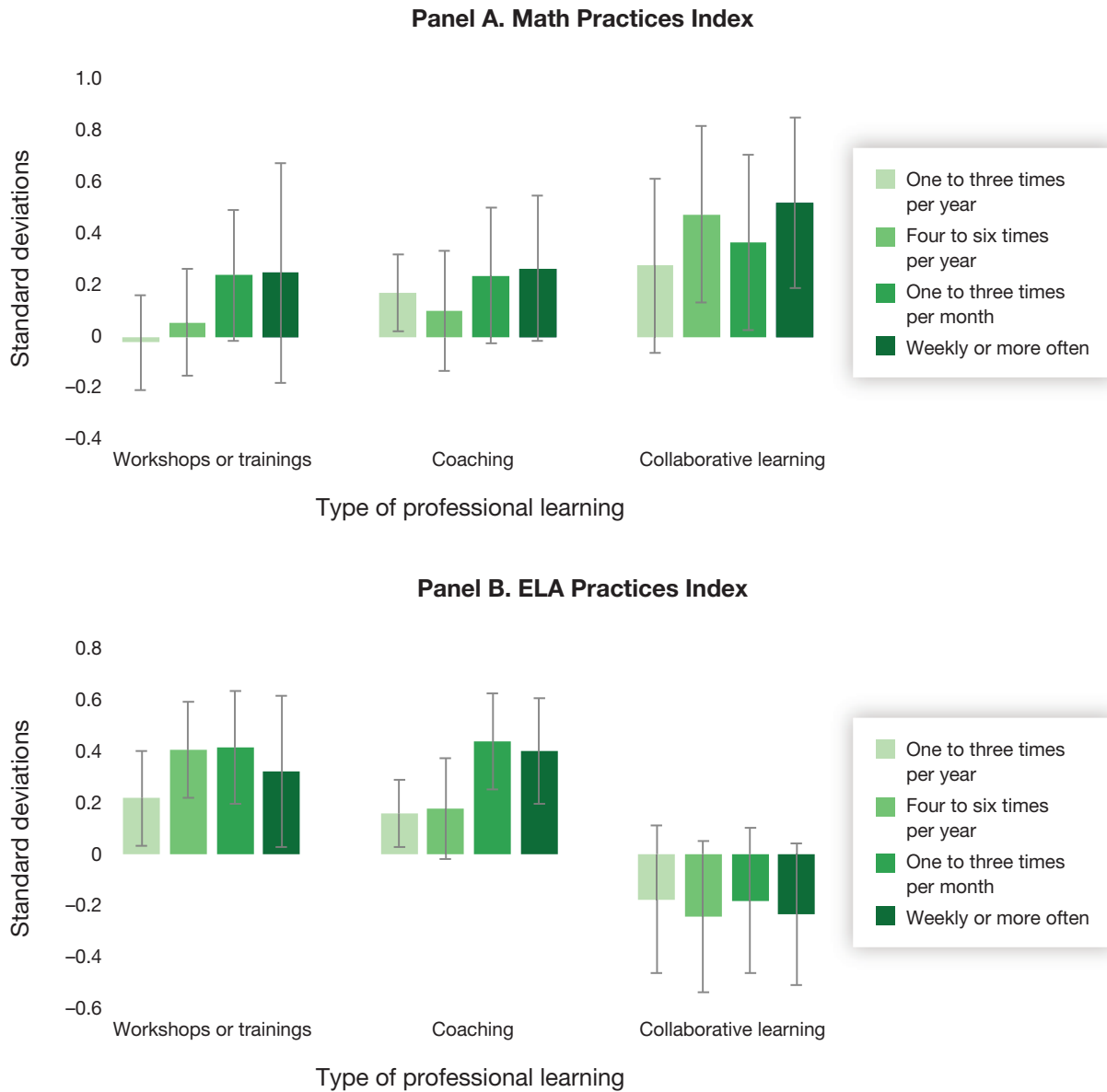
Box 2. Constructing a Classroom Practices Index

Teachers were first asked how many of their last five lessons included a series of subject-specific practices. We provide the complete list of practices in the appendix. We constructed the classroom practices index as follows:

- For each of the practices, we calculated the percentage of the past five lessons, at the time of the survey, in which the teacher employed the practice.
- We calculated each teacher’s average score across all tasks.
- We standardized the index to have mean 0 and standard deviation 1. A teacher with a score of 1 outscores the mean teacher by one standard deviation.
- Standardization occurred within grade bands (elementary, middle, high school teachers). This standardization ensures that comparisons are being made only between teachers of the same grade category and mitigates the likelihood that the prevalence and distribution of high-quality practices differs by grades taught.

FIGURE 7

Effects of PL Participation on Standards-Aligned Classroom Practices Relative to No Participation



NOTE: This figure plots the relationship between involvement in PL activities and the classroom practices index summarized in Box 2. Each bar reflects the index difference (measured in standard deviations) between a given level of involvement versus no involvement whatsoever. Each calculation controls for a variety of teacher-, classroom-, and school-level covariates to account for observable differences across teachers which might be related to their involvement in PL. Only teachers with valid responses to the AIRS classroom practice questions were included. The top panel captures math teachers' responses ($n = 2,537$) and the bottom panel captures ELA teachers' responses ($n = 3,544$).

whether any of the estimates are statistically different from 0, which would indicate that participation in PL is statistically different from nonparticipation. Although we find that involvement in workshops or trainings and coaching appears to have a positive relationship with standards-aligned classroom prac-

tices, most of these effects were either insignificant or near the threshold of significance. By contrast, we find a strong, significant relationship between collaborative learning involvement and the use of standards-aligned math practices. Math teachers participating in collaborative learning at least once

a week scored 0.5 standard deviations higher on the practices index than those who did not engage in collaborative learning. Visually, we observe an upward trend in the index as the regularity of PL increases, although there is too much noise in the data to quantitatively conclude that such a relationship exists.⁷

The results differ substantively for ELA teachers. ELA teachers who frequently participated in workshops or trainings and coaching scored significantly higher on the classroom practices index than teachers who did not participate. Again, higher frequencies of PL involvement appear to visually correspond with higher levels of the practices index. In contrast to our findings for math teachers, we found no difference in the prevalence of standards-aligned classroom practices among ELA teachers who participated in collaborative learning versus those who did not.

Teacher Perceptions of Student Achievement Were Not Significantly Correlated with Participation in PL

Beyond the use of standards-aligned practices, we also investigated the degree to which PL involvement translated to student achievement. Although

the AIRS does not permit us to directly observe classroom performance, the survey asked teachers to self-rate their students' performance relative to grade level using benchmark assessments from earlier in the year, if possible. We converted these responses to a standardized score proxying for student achievement and correlated them to PL involvement. Box 3 provides further detail on the construction of this index.

Figure 8 plots the achievement proxy for each mode and intensity of PL relative to nonparticipation, controlling again for teacher, classroom, and school covariates. We again focus on whether standard error bars cross zero, which indicates a significant difference in classroom achievement between teachers who participated in PL and those who did not. Whereas participation in many types of PL appeared to be connected to more-frequent use of standards-aligned classroom practices, we find little evidence that this translated to student achievement—with the caveat that the data appear noisier for the achievement index as evidenced by the larger confidence intervals. Somewhat surprisingly, evidence of a positive relationship between PL and achievement is strongest,

Box 3. Constructing an Achievement Proxy

Teachers were asked the following question: “Please estimate current average achievement of your students in ELA and math. If your students have taken benchmark assessments this year, please use students’ performance on those assessments to inform your estimates.” Teachers responded on a five-point scale:

- Far below grade level (by more than one grade)
- Somewhat below grade level
- At grade level
- Somewhat above grade level
- Far above grade level (by more than one grade)

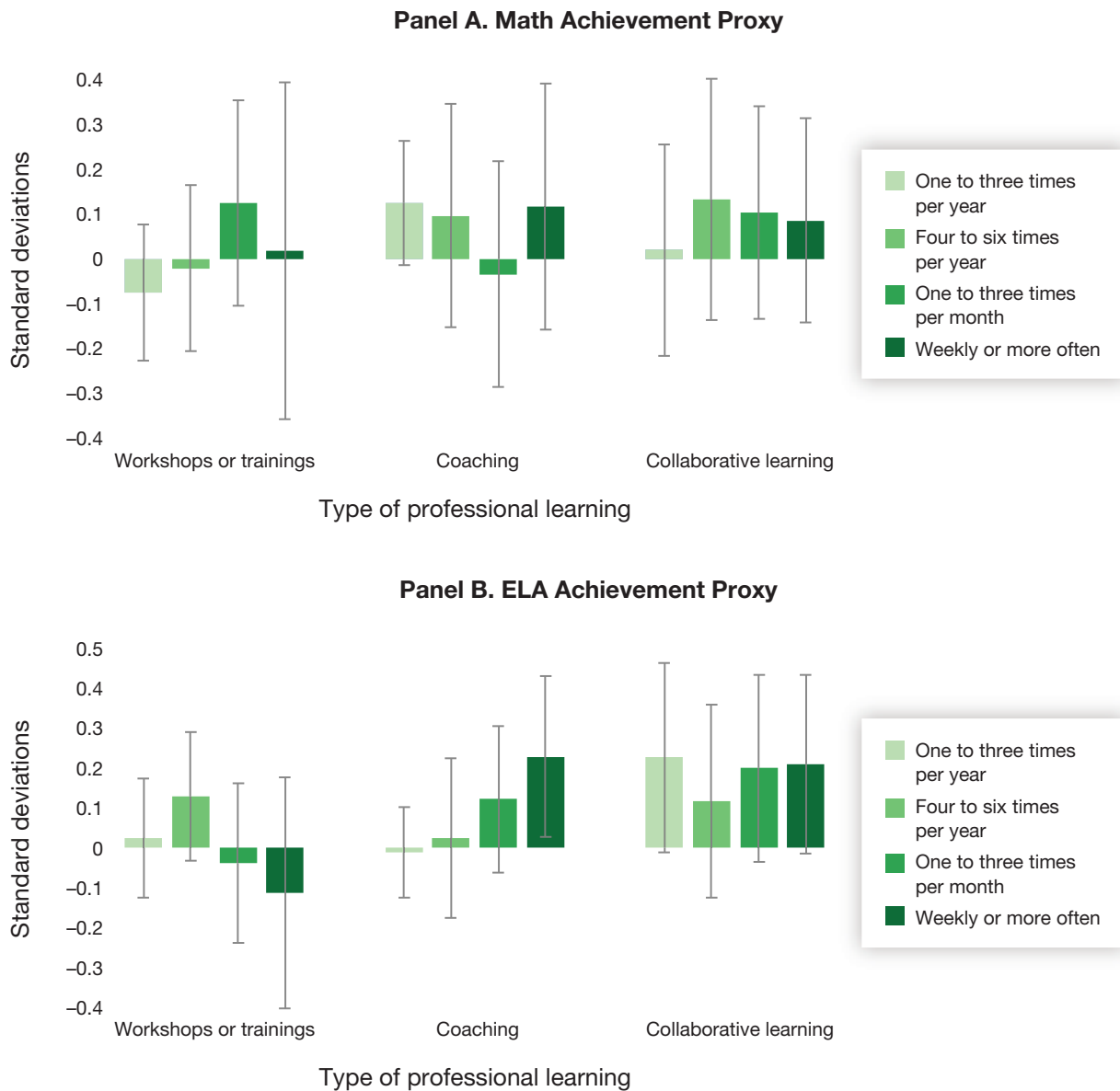
To summarize this achievement metric across all teachers, we created a standardized index using this question. The index was created as follows:

- We assigned each of the above responses a numeric score of 1 to 5.
- We standardized the resulting scores to have a mean of 0 and a standard deviation of 1. Standardization was conducted within grade categories.

We also assessed the correlation between the achievement proxy and the best practices index, controlling for our standard array of school-level control variables. The two proxies were moderately correlated after controlling for teacher-, classroom-, and school-level covariates. For the math practices index, a one standard deviation increase in the best practices index was associated with a 0.20 standard deviation increase in the achievement proxy ($p = 0.000$). For the ELA practices index, a one standard deviation increase in the best practices index was associated with a 0.12 standard deviation increase in the achievement proxy ($p = 0.000$).

FIGURE 8

Effects of PL Participation on Teacher-Reported Estimates of Student Achievement Relative to No Participation



NOTE: This figure plots the relationship between involvement in PL activities and the achievement index summarized in Box 3. Each bar reflects the index difference (measured in standard deviations) between a given level of involvement versus no involvement whatsoever. Each calculation controls for a variety of teacher-, classroom-, and school-level covariates to account for observable differences across teachers which might be related to their involvement in PL. Only teachers with valid, nonmissing responses to the AIRS question on self-reported classroom achievement were included. The top panel captures math teachers' responses ($n = 2,431$) and the bottom panel captures English teachers' responses ($n = 3,435$).

albeit not statistically significant, for ELA teachers who participated in collaborative learning; the data suggest that there was no impact on standards-aligned practices.

We note that teachers could have different interpretations about grade-level standards and how their students compare to those standards (particularly with respect to whether their students were “somewhat” or “far” above or below grade level). Teach-

ers could also vary in their ability to assess student achievement (for example, some teachers might have benchmark assessment results for reference or experienced teachers might have more-accurate assessments), and some might even bias their self-reported responses. Because of this variability, we further investigate the relationship between PL and student achievement by turning our attention to assignment completion, an intermediate outcome that is more tangibly observed and provides fewer opportunities for differences in interpretation to affect teacher responses. Teachers can influence assignment completion through a variety of means, including tailoring curriculum difficulty to student abilities, designing well-tailored homework assignments of the appropriate length, increasing student engagement in the classroom, and shaping student attitudes and expectations with respect to assignments (Bryan and Burstein, 2004). Empirical research further suggests that homework effort and completion are positively associated with student achievement (Trautwein, 2007; Valle et al., 2016) The importance of these skills is underscored by the amount of professional learning time that teachers spent curating their curriculum materials and improving their classroom management skills, as shown in Figure 3.

We focus on a question in the AIRS that asks teachers to report the approximate percentage of their students who completed all (or nearly all) of their assignments. The median teacher indicated that 85 percent of their students had completed nearly all their assignments; teachers at the 25th and 75th percentiles indicated that 70 percent and 95 percent of their students had done so. Math and ELA teachers had similar distributions of assignment completion.⁸

Figure 9 shows assignment completion rates across different modes and intensities of PL, relative to assignment completion rates for nonparticipants. Again, we find scant evidence that teachers who participated in PL reported demonstrably better assignment completion rates than teachers who did not participate. We find suggestive evidence that ELA teachers who regularly participated in coaching reported moderately higher rates of assignment completion than teachers who did not participate in coaching.

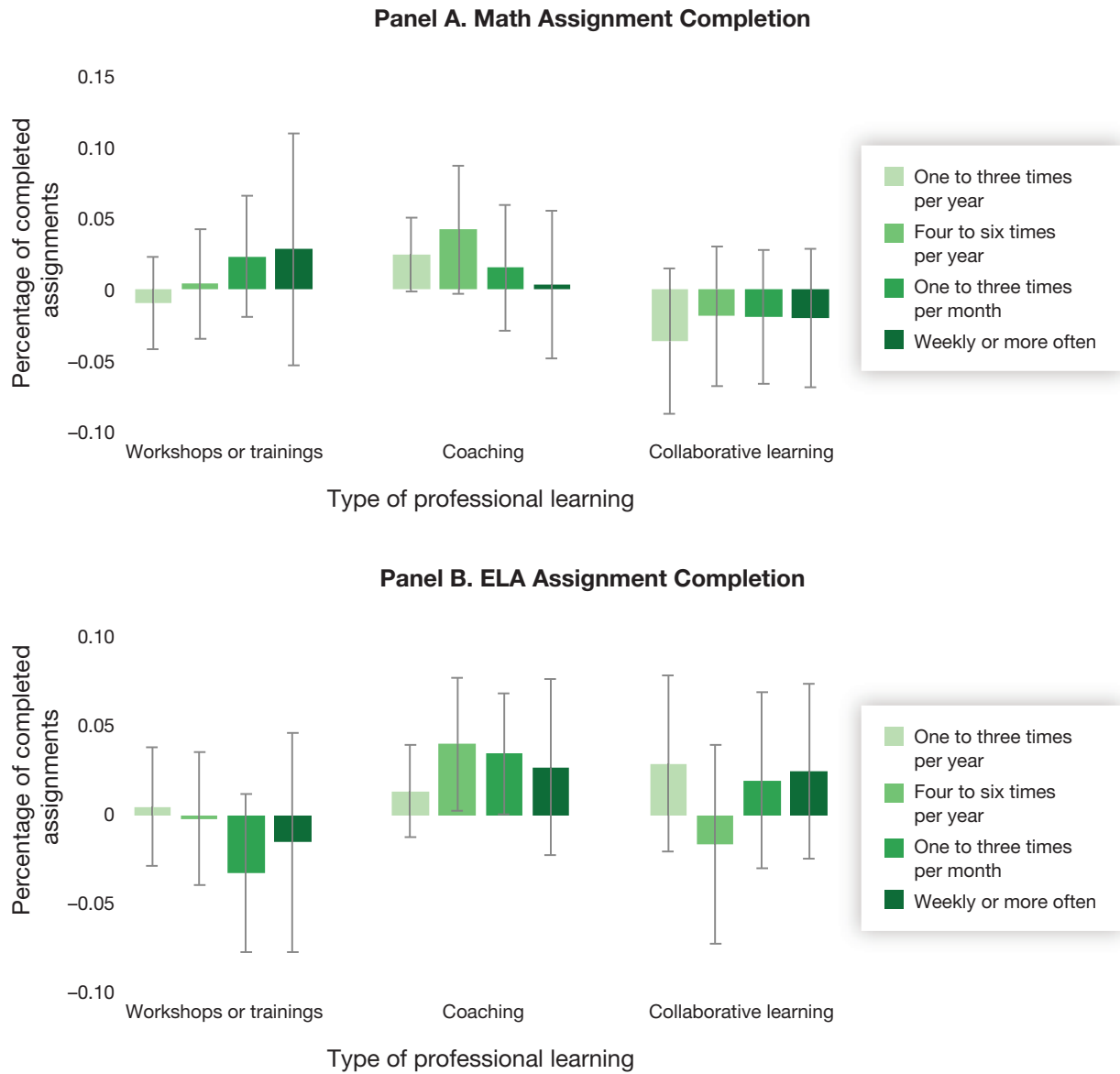
Not only does the content of PL differ between math and ELA teachers, but the downstream benefits for students will likely differ as well.

We note two themes across our findings on classroom practices and student achievement. First, we document stark differences between math and ELA teachers, which underscore the likelihood that the underlying relationship between PL, classroom practices, and student achievement varies by subject and by the mode of PL. Although differences in the classroom index are at least partially a function of differences in how the index was constructed across subjects, teachers were asked to estimate student achievement in the same way across subjects. Curiously, we did not find that these differences were explained by how effective teachers perceived their PL to be given that nearly three-quarters of both math (74 percent) and ELA teachers (73 percent) indicated that they felt collaborative learning helped improve their teaching or student learning to a “moderate” or “large” extent. Furthermore, we note that the teacher value-add literature has long suggested that a standard-deviation increase in teacher quality leads to different effects for math versus ELA achievement (Chetty, Friedman, and Rockoff, 2014). In short, not only does the content of PL differ between math and ELA teachers, but the downstream benefits for students will likely differ as well.

Second, although we find evidence that participation in PL led to changes in teacher-reported classroom practices, we were unable to conclude that

FIGURE 9

Effects of PL Participation on Teacher-Reported Estimates of Assignment Completion, Relative to No Participation



NOTE: This figure plots the relationship between involvement in PL activities and the percentage of a teacher’s students reported to have completed all (or nearly all) of that teacher’s assignments. Each bar reflects the percentage point difference between teachers at a given level of involvement versus no involvement whatsoever. Each calculation controls for a variety of teacher-, classroom, and school-level covariates to account for observable differences across teachers which might be related to their involvement in PL. These covariates—which included teacher’s grade category (elementary, middle, high), years of teaching experience, master’s degree attainment, school urbanicity, and the estimated percentage of the teacher’s students who were English language learners, Black/Latino, eligible for FRPL, and on IEPs—control for a variety of factors that could also affect student completion. Only teachers with valid, nonmissing responses to the AIRS question on self-reported classroom achievement were included: the top panel captures math teachers’ responses ($n = 2,329$) and the bottom panel captures English teachers’ responses ($n = 3,220$).

these changes translated to a significant effect in how teachers reported the achievement levels and assignment completion rates of their students. We again caution that our approach to quantifying classroom practices and student achievement are not definitive, validated measures. Our findings point to the need for further research to examine this link given the time and financial cost of PL.

Summary and Implications

In this report, we examine teachers' responses to the 2022 AIRS to examine how frequently teachers participated in PL, how they spent their PL time, and the extent to which teachers' participation in PL appear to be related to self-reported measures of classroom practice and student achievement. In this section, we highlight our key findings and discuss their implications for practitioners and policymakers. Five key findings emerged from our analysis:

- **Collaborative learning was the most frequently used form of PL for teachers and often the form of PL that teachers thought was most beneficial.** In our analyses, roughly three-quarters of teachers frequently participated (at least four times a year) in collaborative learning, and, among those participating, the vast majority felt that it improved their teaching or student learning to a moderate or large extent.
- **Reviewing student assessment data and discussing how to use and adapt instructional materials were the primary uses of PL time.** More than 40 percent of teachers indicated that they spent at least one-quarter of their collaborative learning time on student assessment data or the use or adaption of instructional materials. Comparatively, more than 40 percent of teachers reported spending no time during their PL on “attending to the diversity of identities” within their classroom.
- **Few teachers reported having extensive access to expertise on subject-area materials or content through their PL.** Less than 15 percent of teachers indicated that their PL offered, to a “large extent,” access to exper-

tise on subject-area content or instructional materials. Access to expertise, in addition to frequency of participation, was a substantial predictor of whether teachers considered the PL they participated in to be beneficial to their teaching and student learning.

- **Teachers who reported frequent participation in PL generally reported higher levels of standards-aligned classroom practices than those who did not frequently participate.** Participation in PL activities translated to higher scores on an index capturing standards-aligned classroom practices, although there were notable differences by subject and by the mode of PL. Teachers who participated more frequently generally appeared to score higher on the index.
- **After controlling for teacher and classroom characteristics, teachers' participation in PL did not appear to strongly correlate with self-reported measures of student achievement.** We found no statistically significant evidence linking PL participation to higher scores on an index capturing teacher reports of their students' achievement. We also did not find any link between PL participation and rates of classroom assignment completion.

These findings have several implications for education leaders: First, these findings make clear that

Teachers who reported frequent participation in PL generally reported higher levels of standards-aligned classroom practices than those who did not frequently participate.

collaborative learning is a likely high-yield lever for improving teaching and learning, particularly for encouraging use of standards-aligned materials. Not only is it the most prevalent type of PL that teachers participated in, it is the type of PL that teachers were most likely to regard as effective for improving their teaching. Our results suggest that **collaborative learning might not be equally effective for all types of teachers**. Specifically, we find that participation in collaborative learning is linked to higher levels of (teacher-reported) classroom practice and student achievement among math teachers and not among ELA teachers. Because most teachers already frequently participate in some form of collaborative learning, improving collaborative learning processes can be an effective way to improve instructional practice. **Districts and schools should acknowledge teachers' perceptions that collaborative learning is an effective form of PL**. They should also work to ensure that teachers have both the time and structures to engage in the high-quality collaborative learning that allows them to focus on materials and how to use them better. Using explicit protocols to plan collaborative learning time, encouraging a focus on curriculum and instruction, and setting consistent times and locations for collaborative learning are among several structural changes identified in the

Because most teachers already frequently participate in some form of collaborative learning, improving collaborative learning processes can be an effective way to improve instructional practice.

research literature that might improve the efficacy of collaborative learning (Miller and Rowan, 2006; Saunders, Goldenberg, and Gallimore, 2009)

One of the strengths of the collaborative learning model is that it draws upon the skills and experiences of existing teacher teams. However, how can schools introduce expertise into teacher teams on new and novel topics? One topic in particular for which outside expertise might be needed is on how to support ELs, a rapidly growing student population within U.S. K–12 schools (Mitchell, 2020). Yet states and educator prep programs unevenly provide training or credentials for teachers to support ELs, which indicates that much of the existing K–12 teaching workforce might be unequipped to adequately instruct the growing numbers of ELs (Quintero and Hansen, 2017); this is borne out in the data that we present in this report, which shows that nearly 40 percent of teachers reported having no access to expertise for supporting ELs through their existing PL.

Additionally, it might be possible that teacher time during PL could be counterproductive to system-wide goals. Whereas states seeking to advance the use of high-quality instructional materials typically promote the skillful use of recommended materials, our data reveal that substantial portions of teachers use collaborative learning time to create new instructional materials. Therefore, one careful consideration for education leaders is how to **balance the trust and familiarity** of collaborative learning structures with other forms of PL, such as coaching and workshops or trainings, that can **introduce teachers to and train them on emerging topics or reinforce systemwide priorities**.

One method of bringing in additional expertise is through coaching. However, despite there being a robust evidence base on the efficacy of coaching (Kraft, Blazer, and Hogan, 2018), teacher self-reports collected through the AIRS on the usefulness of their own coaching experiences were far more mixed. Methods for successful PL will require schools and districts to consider ways to introduce new skills, approaches, and expertise through existing teacher networks, such as PL communities. For these reasons, there is an opportunity for districts and schools to do more to seed expertise among teachers by **investing in more PL for some teachers and potentially**

providing career ladders for teachers to cultivate that expertise and support other teachers. In particular, having master teachers or content leads attend workshops or trainings on emerging topics, such as those to better support ELs, and return to then serve as coaches on these topics for their peers appears to be an effective way to incorporate new skills within teacher teams.

One effective use of this model for encouraging the use of high-quality materials is the High-Quality Instructional Materials ambassador program used by the Mississippi Department of Education, which trains cohorts of teachers on the importance of high-quality materials and best practices for implementation with the intention being that these trained ambassadors disseminate their learnings to their home schools and districts (Mississippi Department of Education, undated).

Although much of our discussion focuses on how school and district leaders can better support the implementation and quality of PL opportunities, state leaders also play an important role in promoting PL by directly providing PL opportunities to schools and districts, providing funds for schools and districts to seek out PL opportunities, or providing signals of what constitutes high-quality PL by identifying recommended PL providers. Given the ubiquity of participation in PL and its links to outcomes of interest, as identified in this report and prior research, an active state role can improve the efficacy of teachers' PL time.

PL is an essential support for teachers to continually refine instruction and implement curriculum materials in a manner that is both rigorous and well-suited to their individual classrooms. This report highlights the state of existing PL practices among K–12 teachers, and we hope it provides practitioners, education leaders, and researchers with valuable insight for the design of and research on future PL programs.

Limitations

There are several limitations to our data and analysis that readers should consider when reading this report. First, although the definitions of the three

modes of professional learning in the survey are intended to align with the definition of these modes as provided by the Council of Chief State School Officers (2023), the AIRS does not explicitly provide respondents with these expanded definitions. Therefore, it is possible that respondents interpreted these modes of professional learning broadly. For example, coaching could be interpreted by teachers as a process involving an observation of instruction coupled with feedback or simply as a consultation with an instructional coach on a relevant topic. Additionally, who a respondent considers a coach could vary from a fellow teacher to an external instructional coach brought in by the school or district. Although part of the broadness of the descriptions of each form of professional learning was intentional to capture a wide variety of professional learning experiences, this is a limitation of the survey; each of the three modes of professional learning that were asked about in the 2022 AIRS could encompass a variety of providers and structures.

Second, we do not have measures of the quality of the PL that teachers received beyond teachers' self-reports. As identified in resources such as Rivet Education's Professional Learning Partner Guide (PLPG), the quality of PL experiences can vary across many dimensions and providers. Future research that considers ways to link teachers' PL providers to ratings, such as those provided by the PLPG, will further enrich our understanding of the relationships we study in this report.

Third, like all research using survey data, our analyses rely on teachers' self-reports of many items of interest, such as their PL activity, the classroom practices and academic achievement of their students, and the demographic composition of the students in their classroom. Potential biases that can stem from self-reported data include inflating the frequency or intensity of particular activities (for example, teachers could overestimate the frequency with which they participate in particular types of PL) or distorting the extent to which two measures are related to one another. The self-reported nature of these data is particularly important to consider when reading our analyses of how PL connects to instructional efficacy; teachers who are likely to over-report participating in PL might also be more prone

to overreporting the extent to which their students are engaged in standards-aligned classroom practices or are at or exceeding grade-level academic achievement. Teachers could also inaccurately recall the achievement of their classrooms (particularly in comparison with grade-level achievement) or purposely inflate their self-reported estimates of their students' achievement levels. In addition, teachers' responses to any items we ask in our surveys are subject to interpretation. For example, a question to teachers about the proportion of PL time they spend "attending to the diversity of identities within my classroom" could lead to variable responses based on how teachers interpret what they do to attend to diverse identities or what counts as a diverse identity.

Lastly, although the analyses conducted to investigate how PL connects to instructional efficacy identify interesting patterns between teacher-reported participation in PL and teacher-reported classroom practices, achievement levels, and assignment completion, these findings should be interpreted with several caveats. These caveats consist of the need for further validation of the classroom practices index we used in the report and the correlational nature of the relationships we analyze. We emphasize that, although it is useful to observe that there is a link between the frequency of PL and the classroom practice index measure that we constructed, we cannot determine from this current report whether more frequent PL caused higher levels of standards-aligned practices or teachers with students who are more prone to engage in standards-aligned practices were more likely to participate in PL.

APPENDIX

Lists of Standards-Aligned Practices

This appendix provides a complete list of standards-aligned practices. The complete list of math practices consists of:

- spending most instructional time on grade-level math topics addressed by state math standards
- relating new math content to other math content at prior grade levels
- relating new math content to other math content within their grade level
- reviewing math content at prior grade levels without connecting it to new math content
- focusing on building their conceptual understanding
- focusing on building their fluency with using math procedures to solve problems
- focusing on applying math learning to real-world contexts
- explaining their mathematical thinking
- building on the thinking of other students
- making sense of problems that do not include clear solution procedures
- choosing which tools to use to solve a problem
- choosing which methods to use to solve a problem.

The complete list of ELA practices consists of:

- focusing on the same grade-level, fictional text as a whole class
- focusing on the same grade-level, nonfiction text as a whole class

How This Analysis Was Conducted

In this report, we used responses from 8,063 K–12 ELA, math, and science teachers from the 2022 AIRS to examine teacher participation in PL and how PL links to classroom outcomes in the 2021–2022 school year. Throughout the report, all results are survey weighted such that the results are representative of K–12 ELA, math, and science teachers nationwide. Furthermore, with exception of analysis conducted as to investigate our fourth research question, the presented figures do not adjust for statistical "controls" and are presented as survey-weighted descriptive statistics. Additional details for the survey items used throughout this report are presented in the notes below each figure and table, with additional information about the 2022 AIRS available in the 2022 AIRS Technical Appendix (Doan, Eagan, et al., 2022).

- focusing on different texts depending on their reading levels
- focusing on a text that includes perspectives of individuals of diverse ethnicities
- applying phonics skills in decoding words
- using evidence from a text to support their ideas during class discussion
- using evidence from a text to support their ideas in a writing task
- building on the ideas of other students during classroom discussion
- applying academic or domain-specific vocabulary (i.e., words and phrases) they have learned in writing or speaking.

Notes

¹ EdReports is an independent nonprofit organization that reviews K–12 comprehensive curricula.

² Teachers were asked to self-report the percentage of students they teach that were EL or eligible for free or reduced-price lunch. We use the term *economically disadvantaged* to refer to students who are eligible for FRPL. Only 1 percent of teachers reported that “0 percent” of their students were economically disadvantaged; 19 percent of teachers indicated that “0 percent” of their students were ELs.

³ These activities include those supporting teachers in providing culturally relevant instruction that addresses students’ cultural interests, backgrounds, or lived experiences. As worded, these activities could also include supporting efforts to make the composition of classrooms more culturally diverse.

⁴ However, the frequency of participation does not fully explain the difference in perceived effectiveness between collaborative learning and the other modes of PL. To assess this, we reweighted the responses presented in Figure 6 so that the distribution of frequency of participation for workshops or trainings and coaching mirrors the distribution of frequency of participation for collaborative learning. In essence, this gave more weight to more-frequent participants in workshops or trainings and coaching who have more-favorable opinions of the efficacy of these modes. As presented in Figure 6, the percentage of teachers who indicated that collaborative learning improved their teaching and learning to a “moderate” or “large” extent was roughly 30 percentage points higher than the equivalent percentages for workshops or trainings and coaching. After reweighting, this gap shrinks to 20 percentage points, suggesting that the higher rates of perceived effectiveness for collaborative learning are not purely explained by the frequency of participation.

⁵ For more information about these items and how they were adapted from Student Achievement Partners surveys, see Kaufman et al., 2018; Opfer et al., 2016; and Opfer et al., 2018.

⁶ The “never” category was used as the required reference group in the regression; the resulting interpretation is that each estimate reflects differences in outcomes between a specific intensity of professional learning and nonparticipation.

⁷ Although the trend from less to more exposure generally corresponds to higher scores on the practices indices, readers might note that the relationship does not always uniformly increase across exposure levels. There are three possibilities for why this might occur: (1) a true nonlinear relationship between PL exposure and practices (e.g., PL fatigue), (2) confounding variables, and (3) statistical noise. For the first possibility, our earlier results suggest that teachers participated frequently in collaborative learning and felt like it was still highly effective for their teaching. For the second possibility, we included a large set of teacher and classroom controls but acknowledge that other unobserved variables could be influencing our estimates. For the third possibility, the most likely explanation, we note that the standard errors in Figure 7 do not rule out the possibility that there is a uniformly increasing relationship. That is, the bounciness in the estimates (particularly for the middle two bars) could primarily reflect statistical noise as opposed to missing controls or a true, nonlinear relationship.

⁸ Assignment completion was more strongly correlated with the achievement index than was the classroom practices index; when controlling for teacher, classroom, and school covariates, a standard deviation increase in math assignment completion was correlated with a 0.24 standard deviation increase in the achievement index (compared with 0.20 standard deviations for the practices index). For ELA, a standard deviation increase in assignment completion was correlated with a 0.21 standard deviation increase in the achievement index (compared with 0.12 standard deviations for the practices index).

References

- Bryan, Tanis, and Karen Burstein, “Improving Homework Completion and Academic Performance: Lessons from Special Education,” *Theory Into Practice*, Vol. 43, No. 3, Summer 2004.
- Chetty, Raj, John N. Friedman, and Jonah E. Rockoff, “Measuring the Impacts of Teachers I: Evaluating Bias in Teacher Value-Added Estimates,” *American Economic Review*, Vol. 104, No. 9, September 2014.
- Council of Chief State School Officers, *The Importance of Instructionally Focused Professional Learning*, 2023.
- Doan, Sy, Joshua Eagan, David Grant, Julia H. Kaufman, and Claude Messan Setodji, *American Instructional Resources Surveys: 2022 Technical Documentation and Survey Results*, RAND Corporation, RR-A134-14, 2022. As of April 25, 2023: https://www.rand.org/pubs/research_reports/RR134-14.html
- Doan, Sy, Maria-Paz Fernandez, David Grant, Julia H. Kaufman, Claude Messan Setodji, Joshua Snoke, Matt Strawn, and Christopher J. Young, *American Instructional Resources Surveys: 2021 Technical Documentation and Survey Results*, RAND Corporation, RR-A134-10, 2021. As of April 25, 2023: https://www.rand.org/pubs/research_reports/RR134-10.html

- Doan, Sy, Julia H. Kaufman, Ashley Woo, Andrea Prado Tuma, Melissa Kay Diliberti, and Sabrina Lee, *How States Are Creating Conditions for Use of High-Quality Instructional Materials in K–12 Classrooms: Findings from the 2021 American Instructional Resources Survey*, RAND Corporation, RR-A134-13, 2022. As of April 25, 2023:
https://www.rand.org/pubs/research_reports/RR134-13.html
- Doan, Sy, and Al Lucero, *Changing the Subject: K–12 Teachers’ Use of and Access to Science-Specific Instructional Materials, Feedback, and Professional Learning*, RAND Corporation, RR-A134-7, 2021. As of April 25, 2023:
https://www.rand.org/pubs/research_reports/RR134-7.html
- Garrett, Rachel, Qi Zhang, Martyna Citkowicz, and Lauren Burr, *How Learning Forward’s Professional Learning Standards Are Associated with Teacher Instruction and Student Achievement: A Meta-Analysis*, Center on Great Teachers and Leaders, American Institutes for Research, December 2021.
- Harris, Alma, “System Improvement Through Collective Capacity Building,” *Journal of Educational Administration*, Vol. 49, No. 6, 2011.
- Kaufman, Julia H., V. Darleen Opfer, Lindsey E. Thompson, and Joseph D. Pane, *Connecting What Teachers Know About State English Language Arts Standards for Reading and What They Do in Their Classrooms: Findings from the American Teacher Panel*, RAND Corporation, RR-2258-HCT, 2018. As of April 25, 2023:
https://www.rand.org/pubs/research_reports/RR2258.html
- Kraft, Matthew A., David Blazer, and Dylan Hogan, “The Effect of Teacher Coaching on Instruction and Achievement: A Meta-Analysis of the Causal Evidence,” *Review of Educational Research*, Vol. 88, No. 4, August 2018.
- Miller, Robert J., and Brian Rowan, “Effects of Organic Management on Student Achievement,” *American Educational Research Journal*, Vol. 43 No. 2, Summer 2006.
- Mitchell, Corey, “The Nation’s English-Learner Population Has Surged: 3 Things to Know,” *Education Week*, February 18, 2020.
- Mississippi Department of Education, “English Language Arts Ambassadors,” webpage, undated. As of April 7, 2023:
<https://msinstructionalmaterials.org/english-language-arts-ambassadors/>
- Opfer, V. Darleen, Julia H. Kaufman, and Lindsey E. Thompson, *Implementation of K–12 State Standards for Mathematics and English Language Arts and Literacy: Findings from the American Teacher Panel*, RAND Corporation, RR-1529-1, 2016. As of April 25, 2023:
https://www.rand.org/pubs/research_reports/RR1529-1.html
- Opfer, V. Darleen, Julia H. Kaufman, Joseph D. Pane, and Lindsey E. Thompson, *Aligned Curricula and Implementation of Common Core State Mathematics Standards: Findings from the American Teacher Panel*, RAND Corporation, RR-2487-HCT, 2018. As of April 25, 2023:
https://www.rand.org/pubs/research_reports/RR2487.html
- Quintero, Diana, and Michael Hansen, “English Learners and the Growing Need for Qualified Teachers,” *Brown Center Chalkboard*, blog, Brookings Institution, June 2, 2017.
- Saunders, William M., Claude N. Goldenberg, and Ronald Gallimore, “Increasing Achievement by Focusing Grade-Level Teams on Improving Classroom Learning: A Prospective, Quasi-Experimental Study of Title I Schools,” *American Educational Research Journal*, Vol. 46, No. 4, December 2009.
- Student Achievement Partners, “ELA/Literacy Lessons,” webpage, undated-a. As of April 25, 2023:
<http://achievethecore.org/category/411/ela-literacy-lessons>
- Student Achievement Partners, “The Shifts,” webpage, undated-b. As of April 25, 2023:
<https://achievethecore.org/category/419/the-shifts>
- Trautwein, Ulrich, “The Homework–Achievement Relation Reconsidered: Differentiating Homework Time, Homework Frequency, and Homework Effort,” *Learning and Instruction*, Vol. 17, No. 3, June 2007.
- Valle, Antonio, Bibiana Regueiro, José Carlos Núñez, Susana Rodríguez, Isabel Piñeiro, and Pedro Rosário, “Academic Goals, Student Homework Engagement, and Academic Achievement in Elementary School,” *Frontiers in Psychology*, Vol. 7, March 2016.

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About This Report

In this report, we use data from the American Instructional Resources Survey (AIRS) fielded in spring 2022 to K–12 math, English language arts, and science teachers to describe teachers’ professional learning (PL) activity, with an emphasis on how much PL time was spent on various topics and activities. Although the focus of the AIRS, and thus the items on PL that we analyze, is largely on using, adapting, and creating instructional materials, the 2022 AIRS also asked teachers whether PL time was spent on various topics, including classroom management and supporting student mental health. This allows us to describe a broader variety of teacher PL activity. We also examine the extent to which teacher participation in PL translates to instructional efficacy, as measured by teacher reports of standards-aligned classroom practices and teacher-reported estimates of student achievement relative to grade level. The AIRS has been investigating adoption and use of instructional materials in K–12 public schools in the spring of each school year since 2019.

The American Educator Panels (AEP) are nationally representative samples of teachers, school leaders, and district leaders across the country. The panels are a proud member of the American Association for Public Opinion Research’s Transparency Initiative.

If you would like to know more about the dataset, please see the *American Instructional Resources Surveys: 2022 Technical Documentation and Survey Results* (RR-A134-14, www.rand.org/t/RR-A134-14) for more information on survey recruitment, administration, and sample weighting. If you are interested in using AEP data for your own surveys or analysis or in reading other publications related to the American Educator Panels, please email aep@rand.org or visit www.rand.org/aep.

RAND Education and Labor

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