



## RESEARCH REVIEW

# Joellen Killion

## Meta-analysis reveals coaching's positive impact on instruction and achievement

### ► AT A GLANCE

Teacher coaching positively affects instructional practice and student achievement.

### ► THE STUDY

**Kraft, M., Blazar, D., & Hogan, D. (2016, November.)** *The effect of teacher coaching on instruction and achievement: A meta-analysis of the causal evidence.* Brown University Working Paper.

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### ► WHAT THE STUDY SAYS

**A** meta-analysis of 37 studies of teacher coaching, many focused on literacy coaching, reveals that coaching positively affects both teaching practice and student achievement. The pooled effects of both general coaching and content-specific coaching have a positive and significant effect on teacher instruction as measured by classroom observations. Both general and content-specific coaching have a positive and significant effect on student achievement. The effects of teacher coaching on student achievement pooled across reading, math, and science are positive and significant. Content-specific coaching has a positive and significant effect on reading achievement. The number of studies of math and science content-specific coaching is small, and results are not significant.

### STUDY DESCRIPTION

Researchers note that the need for teacher professional development is growing as states adopt new content standards, requiring teachers to integrate higher-order thinking skills and social-emotional learning into their curriculum and instruction to meet demands for increased student achievement. Yet, they add, results for studies of the effectiveness of professional development are inconsistent and costs are growing. Coaching is “an essential feature of PD

training that facilitates teachers’ ability to translate knowledge and skills into actual classroom practice” (p. 3).

In this study, researchers examined 37 studies of teacher coaching that met the following criteria: causal or quasi-experimental design and measures of effects on instructional practice and/or student achievement.

Applying meta-analytics, researchers examined questions that a single experimental design study could not answer, including the pooled effects of different coaching models to measure the efficacy of coaching as a form of professional development; leveraging statistical power to examine the cost-effectiveness of coaching; the effects of different models and features of coaching; and the effects of smaller versus larger coaching programs to explore solutions to challenges related to bringing coaching programs to scale.

### QUESTIONS

The study focused on three research questions:

1. What is the causal effect of teacher coaching programs on classroom instruction and student achievement?
2. Are specific coaching program design elements associated with larger effects?
3. What are some of the implementation challenges and potential opportunities for scaling up high-quality programs in cost-effective ways?

## METHODOLOGY

Researchers used a multistep process to conduct the meta-analysis and extended exploratory analyses. They began with a working definition of teacher coaching interventions. Because they encountered so many variations of coaching in the literature — some contradictory — they situated it in the broader context of teacher professional development since it often occurs as a part of a more comprehensive program of professional development.

For the purpose of this study, they defined “coaching programs broadly as all PD programs that incorporate coaching as a key feature of the model” (p. 7). Multiple people can provide coaching, including administrators, master teachers, external experts, and others. They described the coaching process as discussions with teachers about classroom practice in a way that is:

- **Individualized:** Coaching sessions are one-on-one;
- **Intensive:** Coaches and teachers interact at least every couple of weeks;
- **Sustained:** Teachers receive coaching over an extended period of time;
- **Context-specific:** Teachers are coaches on their practices within the context of their own classroom; and
- **Focused:** Coaches work with teachers to engage in deliberate practice of specific skills (p. 8).

Following the defining phase, researchers conducted a literature search to locate and screen studies for inclusion. The four inclusion criteria included the sample (early childhood to 12th grade), the intervention (studies that included teacher coaching as a central feature, yet without a specified limit on the dosage of coaching), the research design (randomized control trials and quasi-experimental methods),



and the outcomes (at least one measure of teacher practice and student achievement).

Identified studies meeting all four criteria were coded for study characteristics; coaching model features; effect size, seeking additional information to calculate effect sizes where they were missing; standard errors; source of study; year of study; research design; level of randomization; teacher sample size; school level; coaching model type; complementary treatment elements such as additional professional development; delivery, in person or virtual; and coaching and total professional development dosage.

## ANALYSIS

Researchers applied sophisticated

meta-analytic techniques to achieve “precision weights and account for clustered nature of the data” (p. 14). The results produced 142 effect sizes for outcomes relating to teacher practice and 79 for outcomes related to student achievement across the 37 included studies, using broad parameters to include as many treatment effects as possible. They examined the association between effect size outcomes and the spectrum of coaching program models and weighed the studies by degrees of precision.

Of the 37 studies chosen for inclusion, 30 studies appeared in peer-reviewed journals, 31 used experimental design, and most were published on or after 2008. Twenty-six evaluated content-specific coaching, with the

### ► WHAT THIS MEANS FOR PRACTITIONERS

Coaching, either alone or in conjunction with other forms of professional learning, has a significant effect on teaching practice and student achievement. This study provides evidence to support district and school investments in coaching and recommends that coaching programs emphasize substantial improvements in teaching practice to increase their effects on student achievement.

The design and implementation of coaching programs influence the potential of those programs to strengthen teacher practice and student results. When designing,



planning, implementing, and evaluating coaching programs, Learning Forward's Standards for Professional Learning (2011) provide guidance. When coaching programs more fully integrate the standards into their design, the variance will likely be reduced and the effects increased.

- **Learning Communities:** Researchers noted only briefly that the conditions within a school influence the effects of coaching. More specific attention to the school's culture for collaboration and continuous improvement and necessary structures are likely to increase the effects of coaching.
- **Leadership:** Little is mentioned in the discussion of programs studied about the role of leadership in coaching, yet it is a necessary and crucial element to address. When principals and coaches are working in alignment to achieve schoolwide goals, the overall effects are likely to be larger because of the coherence of collective efforts.
- **Resources:** The dosage of coaching varies, leading researchers to posit that the quality rather than amount of coaching is more important. For coaching to meet the attributes described by the researchers — namely sustained, focused, and intensive — it is important to

majority of those (22) in literacy and two each in math and science. Eleven studies of general coaching were included. Twenty-nine studies focused on coaching of early childhood or elementary teachers.

Nearly all (89%) of the coaching models were paired with other forms of professional development, most often group training. In 12 studies, teachers received instructional support materials in addition to coaching. Eleven studies relied on video as a coaching source, with teachers receiving virtual coaching in seven studies. The coaching dosage varied from 10 hours or less in six studies to 30 hours or more in six studies. The total hours of professional development for teachers ranged from 20 or less in eight studies to 60 or more in six studies.

### RESULTS

The effect size distribution of coaching on teaching practice and

student achievement is normal with an interquartile range for effect on teaching from .14 standard deviation to .92 standard deviation and between .01 standard deviation and .21 standard deviation for student achievement.

The pooled effect size of coaching on teacher practice is .57 standard deviation ( $p < .001$ ) across the 25 studies with a measure of instructional practice. The effects are larger (.71 standard deviation,  $p < .001$ ) in coaching programs focused on general practices than on content-specific coaching programs (.51 standard deviation,  $p < .001$ ).

In addition, all models of teacher coaching, across all content areas combined, have a positive effect (.11 standard deviation,  $p < .001$ ) on student achievement when pooled across reading, math, and science as measured on standardized tests, a finding drawn from the effect sizes reported in 21 studies. Content-specific coaching in reading (22 of 26 studies) has a .12

standard deviation ( $p < .001$ ) on student reading achievement.

The number of studies focusing on general instructional coaching and measuring student achievement is limited — only three of nine studies — and further research is needed. The effect size across the general coaching studies on teaching practice is .70 ( $p < .01$ ). The effect on student achievement in the three studies of general coaching that measure student achievement as an outcome is not significant. With only two studies focusing on content-specific coaching in math and two in science, effect sizes are not significant.

Researchers conducted additional exploratory analyses of the pooled effect sizes by coaching program feature and found no significant effects by coaching program features. They noted that limitations of statistical power prevent ruling out some relationships. Researchers concluded that the measure

ensure that adequate coaching over a sustained period is available to support improvements in teaching and student learning.

- **Data:** Studies included used at least one measure of teaching practice and student achievement. The small effect on student achievement may have been influenced by the use of annual assessments of student achievement rather than formative classroom-based measures that more directly correlated with the practices teachers are learning to implement.
- **Learning Designs:** Coaching, as the researchers noted, is a learning design for professional learning that is more personalized, focused on classroom practice, and contextually appropriate to teachers' day-to-day work. When it is paired with other learning designs focused on building knowledge and skills in specific content areas, as in a number of the studies, and schoolwide goals for student improvement, the effects may increase with sustained coaching over time.
- **Implementation:** As with all forms of professional learning, sustained, personalized support with constructive

feedback over time is essential to promote and sustain change in practice. Coaching, when it meets the criteria characterized within this study and others not explored, such as supported by leaders and provided by well-prepared and skillful coaches, increases teaching practice and student achievement.

- **Outcomes:** The coaching programs studied measured two outcomes, and researchers examined the interaction between them. They concluded that teaching practice and student achievement are correlated and changes in teaching practice must be substantial to affect student achievement. Those using coaching to increase student achievement, then, may need to identify high-leverage, high-impact teaching practices as the focus of coach-teacher interactions.

## REFERENCE

**Learning Forward. (2011).** *Standards for Professional Learning*. Oxford, OH: Author.

of dosage including the total hours for coaching and coaching paired with other forms of professional development suggest that the quality of coaching, rather than the amount, may be more important, given that the estimate of effect on both outcomes of instruction and student achievement is 0.

In further examination of the nine studies that measured both instruction and student achievement outcomes, Kraft, Blazer, and Hogan explored the effects of coaching on instruction and instruction on student achievement. The effect size is .64, suggesting that changes in student achievement require large changes in instructional quality. They estimated that one standard deviation change in teacher practice produced .15 standard deviation change in student achievement and suggested that this relationship explains why professional development focused on modest changes in teacher practice often fails to impact student

achievement.

The authors also examined issues related to scaling coaching. They noted that smaller coaching programs — those involving no more than 50 teachers — improved teacher practice by .78 standard deviation and student achievement by .17 standard deviation, more than the pooled effects for all studies.

These results are almost double the effects for larger studies. Those involving more than 100 teachers had effect sizes of .42 standard deviation for instruction and .08 standard deviation for student achievement. This finding raises questions about the challenge of scaling up coaching programs, particularly in the areas of selecting and preparing coaches, teacher buy-in, school conditions, and cost.

## LIMITATIONS

Some limitations within this study that influence generalizability are the

number of studies and the variations of coaching model and coaching program features. Because research on the effects of coaching on teacher practice and student achievement is limited, this study provides a firm foundation for more rigorous studies in the future.

Researchers call for more precision in describing coaching interventions and greater standardization in reporting how coaching is operationalized within research studies. Researchers also call for increasing the statistical power of the studies by randomizing at the teacher level rather than the school or district level.

Given the paucity of random-control-trial and quasi-experimental studies of the effects of coaching on teaching practice and student achievement, this study contributes to the existing body of knowledge and offers guidance on improving the quality and effects of coaching and research on coaching. ■