



Instructional Coaching – A Review of the Literature

HISTORY AND BACKGROUND

Instructional coaching involves a complex interaction between coaches and those with whom they work. Its effectiveness ultimately involves at least four levels of learning:

- Principals and other school leaders learning how to implement a coaching program and how best to support the work of the coaches.
- Coaches learning how to effectively manage responsibilities, work with teachers, and navigate the school environment.
- Teachers practicing new teaching methods, mastering new material, and learning to use data to inform practice.
- Students learning in new and different ways as a result of teachers' and coaches' efforts.

West (2017) envisions an ideal school environment where teachers, principals, coaches, and students are all active learners and where teachers, coaches, and principals engage together to study the art and science of teaching. The school in West's vision is described as a learning organization.



INSTRUCTIONAL COACHING DEFINED

Instructional coaching is not a new concept. Joyce and Showers' peer coaching model originated in the 1980s. Early work in the area of content coaching was done at the University of Pittsburgh's Institute for Learning (West, 2017). In recent years coaching has gained in popularity, most notably as a result of policy changes that mandate the use of coaches, including No Child Left Behind and the Reading First Initiative (Nugent et al., 2016).

“*Coaching, at its core, is seen as a method of professional development for teachers. One definition describes coaching as, "in-service PD programs where coaches or peers observe teachers' instruction and provide feedback to help them improve"* (Kraft, Blazar, & Hogan, 2016).”

Though some scholars refer to it as an alternative to "traditional models of professional development" (Kraft et al., 2016) or the "train and hope model" (Shernoff, Lakind, Frazier, & Jakobsons, 2015), coaching has shown more evidence of promise not as an alternative to but as a supplement to other types of professional development (Nugent et al., 2016). Coaching has been referred to as "embedded professional development" (Gallucci, Van Lare, Yoon, & Boatright, 2010) and "sustained" professional development (Nugent et al., 2016) occurring in "real-time" (Shernoff et al., 2015).

Instructional coaching is facilitated by instructional coaches, who have been referred to as "on-site resources for teachers" and people who can provide "targeted professional development opportunities to meet teachers' specific learning needs" (Mangin & Dunsmore, 2015, p. 180). A coach is generally an expert in a specific teaching method or a specialist in a particular area of the curriculum, such as literacy. Subject matter specialists are sometimes referred to as curricular coaches, defined as "an instructional coordinator or supervisor, such as a curriculum specialist in the areas of reading mathematics, or science" (De Jong & Campoli, 2018). Various models exist for how coaches are employed. Coaches might be brought in to a school temporarily on a contract basis, employed full-time by a single school, employed full-time by a district and travel between two or more schools, employed part-time with responsibilities outside of coaching (teaching a limited number of classes, etc.), or employed by a partner university or institute and assigned to assist the school on a regular basis.

Some researchers have referred to coaching as key to improving teachers' classroom instruction and translating knowledge into practice, and a primary goal for coaches is to help teachers grow and become more effective in their work. Coaching might be used in cases where schools are implementing new curricular materials or instructional resources (Kraft et al., 2016) and has been viewed as a means for individual reforms and for systemic reform (Mangin & Dunsmore, 2015). Coaches in the Mangin & Dunsmore (2015) study demonstrated a belief that whole-system change would result from individual interactions with teachers in specific ways that supported their classroom practices.

Facilitating the teacher's transfer of learning is central to effective instructional coaching. For professional development to achieve its desired long-term effects, teachers who participate in that professional development will apply knowledge gained in the context of the classroom and continue to use new knowledge as a basis for refining their practice. To maximize the potential

for transfer, coaching must be ongoing and iterative, allowing teachers repeated opportunities for observation and practice with feedback from the coach in each cycle. Transfer is a task for both teachers and coaches (Joyce & Showers, 1981). "Transfer of teaching skill involves much new learning—when to use new skills, how to modulate them to the students, etc.—learning which has to take place in the process of transfer" (Joyce & Showers, 1981, p. 170). Because of the job-embedded nature of coaching, transfer is in closer proximity than it is with workshops or other more traditional forms of teacher professional development (Shernoff et al., 2015).

THE ROLE OF COACHES

The job of instructional coach is “inherently multifaceted and ambiguous” (Gallucci et al., 2010, p. 922). There is not a large amount of peer-reviewed research that clearly defines the role's parameters (Gallucci et al., 2010), though studies have demonstrated that some tasks that instructional coaches perform are more productive than others (Gibbons & Cobb, 2017).

A sampling of the tasks that an instructional coach might engage in during a given day includes:

- Observing a classroom teacher's lesson (Ellington, Whitenack, & Edwards, 2017; Huguet, Marsh, & Farrell, 2014).
- Co-teaching a lesson (Ellington et al., 2017).
- Modeling a teaching strategy (Hopkins, Ozimek, & Sweet, 2017; Huguet et al., 2014).
- Engaging in informal, one-on-one chats with teachers (Hopkins et al., 2017).
- Leading formal curriculum planning sessions (Hopkins et al., 2017).
- Assessing teacher needs (Huguet et al., 2014).
- Promoting a new curriculum or teaching method (Coburn & Woulfin, 2012).
- Interpreting test results and using data to suggest adjustments for a particular student or class (Coburn & Woulfin, 2012).
- Participating in professional development to grow coaching or content-area expertise (Gallucci et al., 2010).
- Meeting with school administrators to plan a course of action (West, 2017).



In light of the multitude of directions in which they can be pulled, Toll (2016) equates coaches who habitually respond to requests "in the moment" to "travelers who set out without a map" (p. 414). She encourages coaches to plan ahead and carefully consider how they can focus their work to be most effective.

AGENTS OF CHANGE

School leaders have found that simply mandating a new curriculum is not enough. Often, when coaches are brought in to a school, it is to help enact a new program or curriculum. Coaches help implement full-scale change, bridging the gap between abstract idea or policy and implementation in the classroom (Coburn & Woulfin, 2012; Hopkins et al., 2017). To get



all stakeholders working together, coaches might need to engage in or facilitate brokering activities (Huguet et al., 2014). For example, brokering might take place between different communities of practice, such as teachers and administrators, (Ellington et al., 2017) or between previously disconnected teachers (Hopkins et al., 2017).

Another reason why coaches might be brought in to a school is to work with new teachers as they make the transition into the profession (De Jong & Campoli, 2018). In this context, coaches can provide guidance, feedback, and support as new teachers develop their practice in the classroom (Luft, Bang, & Roehrig, 2007), and coaches can help these teachers promote student learning and create a powerful learning environment (Luft, Nixon, Dubois, & Campbell, 2014).

Across the literature, a common theme emerges of coaches engaging in tasks intended to help teachers. Among all of a coach's responsibilities, building strong working relationships with teachers repeatedly appears as a core practice linked to coaching success. The bond between teacher and coach has been shown to be most effective when the two engaged on an emotional level (Shernoff et al., 2015). When coaches were not involved at this level, the teacher/coach relationship was seen as negatively affected (Shernoff, et al., 2015).

As they collaborate with coaches, teachers can improve their practice in areas such as:

- Relating to and communicating with students (De Jong & Campoli, 2018).
- Understanding how students learn (Luft et al., 2014).
- Developing deeper content knowledge (De Jong & Campoli, 2018).
- Making sense of their experiences (De Jong & Campoli, 2018), new information, and school initiatives (Coburn & Woulfin, 2012).

Coaches can facilitate teachers' learning by:

- Engaging in dialogue and questioning (Huguet et al., 2014).
- Guiding teachers to interpret data and use it effectively (Huguet et al., 2014).
- Leading teachers to experience a sense of success (De Jong & Campoli, 2018).
- Modeling how to implement a new curriculum or how to effectively interact with students in the context of a given lesson (Hopkins et al., 2017).
- Providing feedback (Huguet et al., 2014).
- Providing validation and positive reinforcement (Luft et al., 2007).
- Sharing expertise (Huguet et al., 2014).

Key to establishing a positive teacher/coach dynamic is reinforcing the teacher's understanding that receiving help need not be perceived as a negative and does not indicate that the teacher is doing a poor job. As one teacher explained, "It got so hard to get everything done that we realized that we all have shortcomings; we all need help from someone else. And it doesn't mean that you're a bad teacher" (Hopkins et al., 2017, p. 225).

In a study that involved coaching for early career elementary teachers, Shernoff et al. (2015) describe the coach's role as facilitating dialogue rather than taking on the role of expert. When working with teachers, coaches were encouraged to remain optimistic about the school's potential for instructional change. Coaches were also asked to use motivational interviewing techniques, including reflective listening, "rolling with resistance," maintaining empathy and optimism, and promoting self-efficacy and autonomy.



Administrators can support the coaching process by providing teachers opportunities to have detailed discussions with coaches about content to be learned by students. For example, conversations that focus on "foundational core ideas and crosscutting concepts, difficulties in learning the content, and the prior knowledge students should have" have been shown to be effective (Luft et al., 2014, p. 69). Coaches have described the need to have a mix of validation with active problem solving to form an effective relationship with a teacher (Shernoff et al., 2015). In all cases, support that coaches provide should be purposeful and timely. Support that is mismatched to a teacher's current needs wastes time and can hinder the teacher's development (Luft et al., 2007).

BENEFITS OF COACHING PROGRAMS

Widespread research has been undertaken to study the field of instructional coaching and its effects on classrooms, teachers, and students. One notable limitation of this research is that findings are not necessarily generalizable because many studies are qualitative in nature and involve small samples, often from a single school or district. The following is a sampling of some of the notable research findings related to instructional coaching.

New teacher retention

"Curricular coaches may indirectly save urban school districts thousands of dollars by reducing early-career teacher attrition" (De Jong & Campoli, 2018, p. 197). The results of De Jong and Campoli's meta-analysis showed that the presence of an instructional coach had a statistically significant negative relationship ($p < .028$) with teachers leaving the profession. They found particularly strong evidence of the benefit of curricular coaches related to the retention of first-year elementary teachers.

Improved teacher practice and student performance

A meta-analysis showed an effect size of .49 standard deviations (SD) across 43 studies for instructional practice and an effect of .18 SD across 31 studies for student performance on standardized tests (Kraft et al., 2016). The effect sizes were even larger when coaching was paired with group training sessions (.8 SD for instruction and .3 SD for achievement).

Navigating policy and promoting deeper implementation

In a study of how teachers responded to messages related to a Reading First initiative, researchers found that coaches influenced teachers' responses by "pressuring, persuading, and at times buffering them from Reading First" (Coburn & Woulfin, 2012, p. 13). "When coaches were involved in presenting or reinforcing Reading First messages, teachers were much more likely to accommodate and much less likely to assimilate, have parallel structures, respond symbolically, or reject messages" (p. 17). Thus, with coaches involved, teachers showed "deeper forms of enactment" (p. 17). "Teachers responded with accommodation to 52% of messages that involved the coach (28 messages), compared with only 15% (21 messages) when coaches were not involved" (p. 18).

The authors describe the coaches' intervention as follows:

Throughout these activities, the coaches were often able to support teachers in moving to deeper forms of implementation because they helped them negotiate technical challenges of enacting new approaches in their classrooms. The coaches also assisted teachers to push past their first, more superficial responses, where they typically transformed policy through their preexisting worldviews and practice (rejection or assimilation), toward deeper understanding, where they were able to reconstruct their practice in light of the new policy (accommodation). (p. 17)



Specifically, coaches were described as giving teachers practical steps to take to incorporate changes into their classrooms. In the context of using assessment data to inform practice, coaches helped teachers identify specific ways to use the data in designing their instruction and organizing instruction to address students' individual needs. This intervention from the coaches made the difference in assimilation, as "teachers who assimilate policy messages often embrace new approaches wholeheartedly but lack the support to transform their instruction in deeper ways, resulting in assimilation rather than accommodation" (p. 19).

Altering teachers' perceptions of learning

A mixed methods longitudinal study sought to investigate the relationship between the presence of mathematics coaches and teachers' and students' learning (Ellington et al., 2017). Teacher surveys indicated that there was no effect on teacher beliefs from simply assigning a math specialist at the school. However, teachers who were highly engaged with a specialist showed a change in how they perceived student learning. The authors suggest that teachers developed a "sense making view of mathematics" from working with the math specialist. In some schools, teachers were able to collaborate with the math specialist to develop student lessons that approached the content from this perspective.

In Coburn and Woulfin's (2015) study of a Reading First implementation, one of the coaches' most powerful methods of persuasion was to convince teachers that Reading First practices were similar to what the teachers were already doing or that they aligned with the teacher's existing beliefs and values. Doing so resulted in teachers being more receptive to trying new approaches and activities. The authors described the coaches' actions as "constructing congruence" (p. 21). Rules and precedents should be established beginning on the first day of school whenever possible. Otherwise, there is the potential for negative student behaviors to become normative (Pas et al., 2015). A pattern of positive interactions, on the other hand, will generally lead to positive patterns and relationships over the long-term (Wubbels et al., 2015).

SETTING UP A COACHING PROGRAM

The literature provides numerous options and recommendations related to establishing and growing a coaching program, which we'll consider in the sections that follow.

Selecting Coaches

Among the initial steps in building a coaching program is identifying how coaches will be employed and who the coaches will be. As schools engage in this process, they should consider carefully the methods of selecting and hiring coaches. The stakes are high, as exemplified by a coach who was perceived as being ineffective in her role, which one teacher cited as having a detrimental effect on the curriculum (Huguet et al., 2014). If a school or district is choosing coaches from within, researchers caution that basing decisions on the criterion that a candidate was an effective classroom teacher might be problematic, especially when the process does not consider pedagogical content knowledge or skills for working with adult learners (West, 2017).

Two characteristics of strong coaches cited in the literature are content knowledge and interpersonal skills (Huguet et al., 2014). Both should be top considerations in the selection process. However, even if a school chooses coaches with these characteristics in mind, new coaches will not necessarily be established experts as they enter the role. Coaches need continued professional development to equip them to effectively support teachers. One promising professional development strategy is to provide coaches opportunities to collaborate with fellow coaches and supervisors, building a professional learning community where the coaches can learn from one another (Shernoff et al., 2015).



Implementing a Coaching Program

In implementing a coaching program, the literature agrees that coaching works best when the school climate is supportive toward coaching and coaches, teachers, and school leaders are working together collaboratively (Huguet et al., 2014). What types of social supports can a school put in place to help build the most beneficial partnerships between these three groups? (Ellington et al., 2017). The literature has illustrated that the way in which a coach's role is framed might have a significant influence on how coaching is enacted (Mangin & Dunsmore, 2015).

In an example where the partnership between coaches, teachers, and administrators did not work optimally, coaches in the Mangin and Dunsmore (2015) study showed reluctance to initiate conversations with teachers and instead waited for teachers to come to them. They didn't intervene even when they had evidence that a teacher's practice was not adequate or effective. The authors suggested that the lack of proactivity on the coaches' part was due at least in part to the school's strict delineation between coaches as "supporters" and principals as "evaluators."

In a study by Huguet et al. (2014), strong coaches were observed regularly spending time in a broad range of coaching activities. Whereas developing coaches were observed spending a disproportionate amount of their time in the "broker" role. The authors explain that, "spending their time as "broker" may have limited their employment of other coaching practices and may have created perceptions among teachers of the evaluative role of the coach, which may have caused reluctance among teachers to work with [them]" (p. 14).

Studies such as these bring up the question of authority and how it relates to the dynamics of coaching. Administrators are in a position of authority. Coaches typically are not in a position of authority, though teachers sometimes view coaches as authority figures or "pseudo-administrators" (Coburn & Woulfin, 2015). When teachers see coaches as working for the administration or having the power to make judgments regarding their performance that could affect their employment, teachers are less willing to work with coaches. In reality, however, coaches rarely have that type of power and are typically non-supervisors (Gallucci et al., 2010) and must rely on "expertise and relationships to exert influence" (Gallucci, et al., 2010, p. 922).

A more effective paradigm is for administrators to frame coaches as teachers' trusted peers, working together with the teachers in a type of mentor/mentee relationship. Huguet et al. (2014) relate this view of the relationship between teachers and coaches to Vygotsky's conception of learning from a "more knowledgeable other." One way to gain early buy-in from teachers and help develop this type of paradigm is to involve teachers in the design of the coaching process and give them a voice in how they will work with coaches (West, 2017).

West (2017) also suggests creating a protocol for handling disagreements between coaches and teachers on instances where the principal and coach do not feel a teacher is making progress. However, she also suggests that the relationship between coach and teacher should be transparent enough that the two can speak candidly about progress, what is working, and what isn't working. Taking concerns to the principal should not be the coach's first step. The same is true of the teacher.

Principals and other administrators can have a significant effect on the success of a coaching program. It is important for school leaders to take a systematic and long-term approach toward implementing coaching initiatives and connecting those initiatives with formal professional development for teachers (Hopkins et al., 2017). Administrators are important in "shaping the work of a coach through their mediation of political dynamics in a school" (Huguet et al., 2014, p. 2). Having a leader who sets clear expectations opens the door for more focused collaboration between teachers and coaches (Hopkins et al., 2017).



A principal's words and actions are also important in setting the tone for the entire school's acceptance of a coach's work. Principals can publicly endorse the coaching program, acknowledge the coach's expertise, take the time to be involved in coaching-related activities, and demonstrate how coaches can be used as a valuable resource for teachers. They can also encourage individual teachers to meet with a coach and then follow up with them to see how the coaching session went (Matsumura, Sartoris, Bickel, & Garnier, 2009).

Some researchers see coaches in a unique position to serve as conduits in the "flattening" of relationships between teachers and administrators. Coaches "can facilitate the transition from a hierarchical model of interaction to a partnership model that engenders inquiry, reflection, and informed action by teachers and administrators" (West, 2017, p. 314).

COACHING STRATEGIES AND PRACTICES

One of the most important aspects of a coach's work comes in the form of one-on-one coaching sessions with teachers. The literature suggests a number of models and strategies to make these coaching sessions as productive as possible.

Productive Coaching Sessions

Gibbons & Cobb (2017) cite five characteristics of quality professional learning (pp. 413-414):

- It provides opportunities that are intensive and ongoing.
- It includes activities related to the problems that teachers encounter in their daily work.
- It orients teachers to focus on student thinking.
- It fosters the development of teacher communities.
- It provides opportunities to investigate and enact pedagogical routines and practices (active learning).

In relation to these characteristics, they identify the following coaching activities as potentially the most productive (Gibbons & Cobb, 2017):

- Analyzing classroom video
- Engaging in the discipline
- Examining student work
- Engaging in lesson study
- Co-teaching



Observing instruction and modeling Kraft et al. (2016) suggest five characteristics of effective coaching sessions:

- Individualized (one-on-one interaction between the teacher and coach)
- Intensive (interactions occur at least once every two weeks)
- Sustained (continues over an extended period)
- Context-specific (tailored to the needs of the teacher's classroom)
- Focused (involves deliberate practice of specific skills)



Models proposed by Nugent et al. (2016) and Toll (2017) provide a structure for the coaching process and outline two possible paths toward effective collaboration between teacher and coach.

Inquiry and problem solving between the teacher and coach

Nugent et al. (2016) describe a coaching model that involves cycles of joint planning, action and practice, observation, reflection, and feedback, specifically following a protocol of:

- Positive coach feedback.
- Review of desired student outcomes and teaching strategies that promote student inquiry skills.
- Detailed discussion of the lesson, including sharing time-stamped video clips to demonstrate what worked well and why and what student outcomes need to be addressed or improved.
- Exchange of ideas about strategies to address areas for improvement.

Coaches in the Nugent et al. (2016) study used both scaffolding and questioning techniques to lead teachers to improved understanding and proficiency in their guided scientific inquiry instruction. Coaching generally consisted of one to two sessions per week over six to eight weeks. The coach and teacher agreed to end coaching when the teacher believed he or she was able to effectively implement the guided inquiry approach without further assistance and the coach had documented that the teacher possessed the needed skills.

Toll's Problem-Solving Method of instructional coaching

Toll's (2017) problem-solving coaching model has teachers identify a problem and then think carefully about that problem before they decide how they will try to solve it. It invites teachers and coaches to resist the urge of identifying a problem and jumping immediately into a solution. Toll's method is cyclical and involves three basic steps that can repeat until a suitable solution is found.

1. Understand the problem.
2. Decide how to address the problem.
3. Try the proposed solution and evaluate the results.

The three-step problem-solving approach requires “going slow at first to go fast further on” (p. 421). By considering the problem in more depth at the beginning of the process, the teacher and coach are more likely to find a suitable solution sooner. Throughout the steps, there are various questions that coaches can ask teachers to help them work through the process, such as asking “What are the students doing when this problem occurs?” during the understand step (p. 418).

Another important part of the problem-solving model is determining how success will be measured. Relying on anecdotal evidence provides limited insight into the results. Toll suggests that instead “coaches can help teachers think about signs of success if their efforts are effective and then identify how they will determine if each sign of success has occurred” (p. 419).

Coaching with Technology

To be effective, coaching sessions do not necessarily need to take place in person. Videoconferences between teacher and coach can be effective in providing professional training (Nugent et al., 2016). In one case study of using digital tools for coaching, including FaceTime, email, and video and audio recordings of classroom interactions, the authors, two of whom were also subjects in the study, indicated that “digital technologies create additional options for teachers



by expanding resources and training mediums to help address obstacles posed by the limits of time or by geographical constraints” (Leighton et al., 2018, p. 40). For example, videoconferences between teacher and coach might be employed as a primary means of interaction in situations where a rural school is working with coaches from a distant city. In other cases, tools such as email and FaceTime can help teacher and coach stay in touch and refine strategies in the periods between coaching sessions.

Data-Driven Decision Making

A "data-driven" teacher is one who is called upon to use student data to guide instruction (Huguet et al., 2014).

“Data, however, rarely serves as a motivator for teachers—rather, teachers are more easily motivated by seeing their students succeed and by the prospect of becoming better at their job.”

When coaches begin their discussion of data with those motivations in mind, they are more likely to capture the teacher’s attention and cooperation (Toll, 2016).

Data can inform teachers’ efforts in areas such as setting goals, tracking students’ progress, and adjusting content and sequencing. Teachers, however, often need assistance with making the connection between an identified problem and an appropriate response. (Huguet et al., 2014). Strong coaches have been identified as not only helping teachers access data but also helping them investigate what it means and how to respond to it. One-on-one coaching sessions allow teachers the opportunity to develop a response immediately with the support of the coach. In contrast, weaker coaches simply help teachers to access the data without providing additional guidance (Huguet et al., 2014).

Pairing Coaching with Other Professional Development

Research has suggested that coaching might be most effective when it is paired with other forms of training that are designed to introduce teachers to new concepts, knowledge, or skills. Results of one quantitative study showed that a summer institute was effective in helping teachers to gain knowledge, while follow-up coaching sessions were effective in helping teachers to translate that knowledge into practice. Both the institute and the coaching appeared to contribute to teachers' gains in self-efficacy (Nugent et al., 2016). Kraft et al.’s (2016) meta-analysis of coaching also reinforced the idea that building knowledge prior to coaching is an effective strategy. When designing a coaching program, it’s important to ask what knowledge and experience teachers need before they begin working with a coach and then determine the best method for delivering that prerequisite training.

CONCLUSION

An effective coaching program is part of a school-wide learning culture that encompasses all levels, from students to administrators. Instructional coaching has been shown to be an effective way to help teachers grow their practice, which in turn can lead to better student performance in the classroom. The coaching role can be multi-faceted and complex and benefits from a collaboration between teachers, coaches, and administrators to focus the effort and target areas of greatest need. By working together, these stakeholders can create and sustain a climate that is conducive toward coaching and develop a coaching strategy that empowers teachers to be their best and ultimately contributes to improved student outcomes.



REFERENCES

- Coburn, C. E. & Woulfin, S. L. (2012). Reading coaches and the relationship between policy and practice. *Reading Research Quarterly*, 47(1), 5-30.
- De Jong, D., & Campoli, A. (2018). Curricular coaches' impact on retention for early-career elementary teachers in the USA: Implications for urban schools. *International Journal of Mentoring and Coaching in Education*, 7(2), 191-200.
- Ellington, A., Whitenack, J., & Edwards, D. (2017). Effectively coaching middle school teachers: A case for teacher and student learning. *The Journal of Mathematical Behavior*, 46, 177-195.
- Gallucci, C., Van Lare, M. D., Yoon, I. H., & Boatright, B. (2010). Instructional coaching: Building theory about the role and organizational support for professional learning. *American Educational Research Journal*, 47(4), 919-963.
- Gibbons, L. K., & Cobb, P. (2017). Focusing on teacher learning opportunities to identify potentially productive coaching activities. *Journal of Teacher Education*, 68(4), 411-425.
- Hopkins, M., Ozimek, D., & Sweet, T. M. (2017). Mathematics coaching and instructional reform: Individual and collective change. *The Journal of Mathematical Behavior*, 46, 215-230.
- Huguet, A., Marsh, J. A., & Farrell, C. (2014). Building teachers' data-use capacity: Insights from strong and developing coaches. *Education Policy Analysis Archives*, 22, 52.
- Joyce, B. R. & Showers, B. (1981). Transfer of training: The contribution of "coaching." *Journal of Education* 163(2), 163-172.
- Kraft, M. A., Blazar, D., & Hogan, D. (2016). The effect of teacher coaching on instruction and achievement: A meta-analysis of the causal evidence. *Review of Educational Research*, 0034654318759268.
- Leighton, C., Ford-Connors, E., Robertson, D., Wyatt, J., Wagner, C., Proctor, C., & Paratore, J. (2018). "Let's FaceTime tonight": Using digital tools to enhance coaching. *The Reading Teacher*, 72(1), 39-49.
- Luft, J. A., Bang, E., & Roehrig, G. H. (2007). Supporting beginning science teachers. *The Science Teacher*, 74(5), 24-29.
- Luft, J. A., Nixon, R. S., Dubois, S. L., & Campbell, B. K. (2014). Supporting newly hired science teachers. *The Science Teacher*, 81(6), 67-71.
- Mangin, M. M. & Dunsmore, K. (2015). How the framing of instructional coaching as a lever for systemic or individual reform influences the enactment of coaching. *Educational Administration Quarterly*, 51(2), 179-213.
- Matsumura, L. C., Sartoris, M., Bickel, D. D., and Garnier, H. E., (2009). Leadership for literacy coaching: The principal's role in launching a new coaching program. *Educational Administration Quarterly*, 45(5), 655-693.
- Nugent, G., Kunz, G., Houston, J., Kalutskaya, I., Wu, C., Pedersen, J., Lee, S., DeChene, S. E., Luo, L. & Berry, B. (2016). The Effectiveness of Technology-Delivered Science Instructional Coaching in Middle and High School. Working Paper. *National Center for Research on Rural Education*, 1-39.
- Shernoff, E. S., Lakind, D., Frazier, S. L., & Jakobsons, L. (2015). Coaching early career teachers in urban elementary schools: A mixed-method study. *School Mental Health*, 7(1), 6-20.
- Toll, C. A. (2016). A problem-solving model for literacy coaching practice. *The Reading Teacher*, 70(4), 413-421.
- West, L. (2017). Principal and coach as partners. *The Journal of Mathematical Behavior*, 46, 313-320.

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