

# PART I

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## *The Coach's Work*



# 1

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## *What Is Coaching?*

**B**efore moving into this opening chapter, consider the following questions for reflection:

- What is the role of a mathematics coach?
- How would you define coaching? What images come to mind?
- What renders coaching effective?

There are coaches in many professions. There are athletic coaches. There are business coaches. There are financial coaches. And now there are coaches in schools. Operationalizing a definition of coaching in schools, however, can be elusive. What does this coaching look like in practice? What does the coach do in a school or classroom? What does the teacher do when he or she is being coached? How do you know if coaching has been successful or effective?

This opening chapter presents a case intended to provide one example of a coaching encounter; by analyzing this interaction between a teacher and coach, essential elements of coaching will surface. Discussion will then turn to several research-based models of coaching that reflect these essential coaching elements. This sets a foundation for the chapters that follow in which cases unpack and illustrate essential elements of coaching and describe how various coaching dilemmas are navigated.

## Case: Coaching in Action ∞ Ann, Grade 5

This case presents a fifth-grade classroom where students were engaged in a game activity to develop fluency with mental math subtraction strategies. My interactions with a student during this class session provided me with insights into the pitfalls some students were falling into in their subtraction work. In a private conference with the teacher “on the side,” I was able to use the student observations as a vehicle to draw out further questions, connections, and self-reflection from the teacher. I was also surprised to learn that the teacher did not have a clear understanding of the mathematical purpose of the activity. All of this brought new insights to my coaching agenda for her.

### SETTING THE STAGE

Ann’s fifth graders worked in pairs playing “Close to 0,” a game intended to develop fluency and flexibility with mental math broadly and subtraction strategies specifically (Kilman, Tierney, Russell, Murray, & Akers, 2004). The students were to arrange a set of digit cards in such a way as to create two three-digit numbers whose difference was as close to zero as possible. Both Ann and I circulated among the pairs to note our observations on Post-its.

Paul had arranged his digits in the following manner:

$$\begin{array}{r} 364 \\ -353 \\ \hline \end{array}$$

He moved his finger down each column from right to left, subtracted each separately, and arrived at a difference of 11. He was quite satisfied with that arrangement. He had already demonstrated an ability to persist in this work in the earlier rounds of the game I had observed, so I decided to prompt him to think further about arrangements of the digits. I asked if there was another way to arrange the digits; he began to try moving some of the digits, but each time he placed the 3 above the 4, he would quickly move it back.

What was going on here? Was he avoiding this because, using his strategy of doing the traditional column subtraction, he would need to borrow mentally and hold that in his head? That seemed to be his only approach to subtraction. I wanted to push him to inspect the numbers as whole quantities and to consider strategies of counting up—of seeing the relationship between addition and subtraction and using landmark numbers. Now how could I push him to consider these other computational strategies? It was becoming evident to me how much I learn through this coaching work in classrooms—that is, how my own understanding of children’s development of mathematical ideas (and how to support that development) grows as I listen to children and teachers in the classroom.

I decided to pose the possibility of  $363 - 354$  to him and see how he would tackle it. I moved the digits and then asked him, "How about this arrangement?" Paul thought for a moment and seemed to begin to apply his traditional borrowing technique. I commented on what I noticed him doing and asked, "Is it sometimes hard for you to keep all those numbers in your head?"

He looked relieved as I acknowledged his hard work and effort. "Yes!" he said.

I encouraged him to look at the numbers as a whole and reminded him that he may know some landmark numbers that could be useful here. We had already talked together in an earlier round about counting up as being another strategy when finding differences, so I referred to this as well.

Paul then announced, "So, 6 more would get me to 360, then plus 3. That's 9!"

This counting-up strategy using landmark numbers was an indication of Paul's number sense, and it certainly was carried out with greater ease than the mental borrowing he had been trying with those numbers.

## MAKING THE MOVE

A few minutes later, Ann and I moved off to the side of the room together, accessible to the children but able to converse about our observations. I wanted to share my interaction with Paul, but I first wanted to hear Ann's interpretations of the children's work.

"What have you noticed?" I asked.

She described that her students would avoid arranging the digits in such a manner that a "bigger number in the ones place would need to be subtracted from a smaller number in the ones place." They would avoid this situation and so were not exploring arrangements of the digits that would lead to differences closer to zero. Ann attributed this to the fact that they were avoiding borrowing since they needed to do this mentally and did not have pencil and paper for the game. But, she said, she wasn't sure what to do about it.

I was able to confirm her observations by sharing excerpts from my notes about Paul with her. As I told Ann of my interactions with Paul, she indicated that this was what she had been seeing with others in the classroom and was glad to hear how I approached it with him.

"That's good for me to hear what you did because I'm not always sure if I should do anything or not or if I should show them something or not," Ann said.

This comment made me think that Ann was working hard to find a balance when supporting children's learning. This seemed like it would be important to talk more about with her. It seemed like an opportunity to explore the role of the teacher in math class.

But before I could say anything else, Ann came forth with another question: "So, what *is* the purpose of the game? I mean, I know it is in our

program here, but I don't think in the three years I have been teaching it that I've really ever known what it's meant to do."

Her question took me by surprise. I realized then that I had overlooked this very important question. I had assumed that Ann recognized the purpose and mathematical objectives of the game and that she saw how this game was a tool for supporting computational fluency strategies, building on games and work the children had encountered while developing efficient strategies in other grades. But then it occurred to me that this game was coming in the midst of a unit in which Ann had seen the focus as factors, multiples, and strategies for multiplication and division. Ann had also not taught at any other grade level; most likely, she was not familiar with the work on addition and subtraction strategies that is done at other grades.

I felt speechless for a moment. Although I understood the mathematical goals of the game, I wondered how I should approach this question with Ann. How could I help her to make sense of the ideas herself right here and recognize the mathematical *agenda* that the game promoted? I decided to refer back to Paul, and we compared his two strategies again. This gave us a context for a discussion about developing fluency with addition and subtraction—fluency grounded in landmark numbers, number sense, and number relations.

"Then," Ann remarked, "when I see Sarah doing  $303 - 298$  on a piece of paper it *is* good for me to stop and ask her to think about how far away 298 is from 300 so she can do it in her head!" It felt like we were both making sense of our observations of children and determining ways to support their mathematical growth. Ann looked relieved to have had her instincts validated by our brief conversation as the students continued to work. "I've been teaching this for three years, but now I think I finally understand the purpose of this game," she exclaimed.

This made me realize that there are instances in which learning goals and purposes may be obvious to the authors of an instructional text or curriculum program but must be made more explicit for a teacher. This, then, must be a part of my work as a coach.

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## TAKING A CLOSER LOOK

This encounter with Ann serves to illustrate a broad collection of essential elements of coaching:

- A trusting teacher-coach relationship
- A focus on deepening mathematical content and pedagogical content knowledge
- The effective use of questioning techniques
- Listening skills
- Coaching discussions grounded in student thinking and student work

Not only are these elements of coaching evident in Ann's case, but they will emerge in a variety of other coaching encounters presented in the cases throughout this book.

Perhaps the most critical element of this coaching encounter with Ann was the teacher-coach relationship that had been built over our months of working together. It was the trust in that relationship that gave Ann permission to make public her own questions about curriculum content and her instructional practices in the classroom. With careful listening, I could gather insights to inform the direction not only of this particular coaching interaction but of future sessions with Ann that could deepen her mathematical and pedagogical content knowledge.

Launching the teacher-coach dialogue with an open-ended question such as "What have you noticed?" not only allowed me to move forward from Ann's level of understanding and focus, but it also communicated to Ann a spirit of collaboration and validated her own observations of the students. With such an open-ended question, the coaching encounter also ensured that Ann reflected on practice and student learning in the moment. What's more, the entire coaching encounter remained grounded in students' work and mathematical thinking, the shared interest of both teacher and coach. Paul's thinking in particular provided a neutral ground for discussing the issue impacting student learning.

## RESEARCH-BASED MODELS OF COACHING

The essential elements of coaching illustrated in Ann's case are also the common threads that are found throughout coaching definitions and models presented in research and professional literature. Researcher Jim Knight (2006) defines coaching as "a nonevaluative, learning relationship between a professional developer and a teacher, both of whom share the expressed goal of learning together, thereby improving instruction and student achievement" (para. 6). Koh and Neuman (2006) reviewed research related to coaching with respect to literacy and compiled a set of 10 "exemplary elements of coaching." These exemplary elements include coaching that is on-site, ongoing, and sustained over time; coaching that aims to facilitate teacher reflection; coaching that provides descriptive feedback to teachers; and coaching that results in improved student outcomes.

There are a variety of models that can be considered, compared, and contrasted as we seek to bring greater clarity to coaching and develop coaching practices that remain true to the essential elements of coaching and best serve a given context and school community.

All of the models speak to the importance of establishing respectful and trusting relationships with teachers in coaching work. All of the models make the call, either implicitly or explicitly, for sufficient time for coaches to work with teachers. This is time that should be devoted to collaborative learning conversations that allow the coach to serve as a mediator of reflection, as the

conduit from the lesson to the teacher's reflection and learning. All of the models also make the call for professional development for coaches, recognizing that coaches need to develop expertise not only in content knowledge related to mathematics and pedagogy but also coaching skills, questioning techniques, and other professional skills that allow them to best promote adult learning.

Yet there are differences as well. Some models, such as content-focused coaching, are specific to mathematics coaching, while others, such as cognitive coaching, are coaching models that cut across disciplines. The intent here is not to provide a full literature review of coaching research but rather to provide an overview of the models that may serve as valuable resources to a mathematics coach. In this overview, four models will be discussed: (1) Art Costa and Robert Garmston's Cognitive Coaching, (2) content-focused coaching described in the work of Lucy West and Fritz Staub, (3) Jim Knight's instructional coaching, and (4) the pedagogical content coaching model described by David Foster and used by coaches in the Silicon Valley Mathematics Initiative. Each model contributes to the decision making that is apparent throughout the cases in this book; these are models that I have drawn upon and adapted in my own coaching work.

### **Cognitive Coaching**

Art Costa and Robert Garmston developed Cognitive Coaching as a supervisory or peer coaching model that supports others as they enhance their own cognitive processes, including reflection and problem solving. Cognitive Coaching "enables people to modify their capacity to modify themselves" (Center for Cognitive Coaching, 2009, para. 1). In such a model, emphasis is on bringing the person being coached, not the coach, to the point of evaluating what is effective or ineffective about his or her own practice.

The model is based on a set of assumptions related to the cognitive processes necessary in teaching and the capacity of an individual for reflection and growth. The role of the coach is one of a mediator, "one who figuratively stands between a person and his thinking to help him become more aware of what is going on inside his head" (Center for Cognitive Coaching, 2009, para. 3). In Sparks's (1990) interview with Robert Garmston on Cognitive Coaching, Garmston elaborates further, stating, "This is a process of self-motivated and self-directed learning and the job of the coach is to support the teacher in this natural journey. The coach does this by becoming another set of eyes for the teacher and a mediator of the teacher's processing of his or her own teaching experiences" (p. 13). Self-coaching emerges as the goal of Cognitive Coaching.

As in all of the models, trust and rapport between the teacher and coach are the foundation. In Cognitive Coaching, the model then unfolds in the components of a preconference, a lesson observation, and a postconference. Questioning techniques during both the pre- and postconferences are



open-ended and probe for teacher perspective and reflection. Responses by the coach to the teacher's reflections and comments are nonjudgmental. Attention is given in the postconference to supporting the teacher in recalling the lesson for reflection and discussion, rather than the coach sharing back what was observed (Sparks, 1990).

My philosophy of coaching is grounded in the notion of a coach as a mediator of teacher reflection. For this reason, I was drawn to the Cognitive Coaching model. The notion of building teacher independence and a stance of self-reflection by coaching through open-ended questioning is evident in many of the cases in the chapters that follow. However, as I began coaching in mathematics classrooms, I realized that Cognitive Coaching alone was not sufficient for my work with all teachers. I needed to consider the particular challenges of coaching elementary classroom teachers who may have limited comfort levels with the content; many of these teachers have a need for deeper content knowledge and deeper understandings of how children develop these ideas in order to systematically reflect on their practices. As I encountered the realities of coaching, I began to push the boundaries of the Cognitive Coaching model. I found myself raising questions:

- What does coaching look like if the teacher first needs to learn the mathematics for herself?
- Is there a time when coaching moves need to be more explicit and direct?
- What does that look like?

### **Content-Focused Coaching**

The content-focused coaching model described by Lucy West and Fritz Staub (2003) addresses some of these questions, and their text brings a focus on mathematics coaching specifically at the elementary level. As such, it was the most obvious resource for my work as a coach. Content-focused coaching is content specific. Like other coaching models, it is grounded in a cycle of prelesson conferences, lessons, and postlesson conferences. Unique to content-focused coaching, the coaching conversations with a teacher make use of specific conceptual tools to focus and guide the conversations in a manner that develops the teacher's pedagogical content knowledge. These tools include a framework for lesson design, a set of learning principles, and a set of core issues in mathematics lessons. West and Staub state:

Content-focused coaching zeroes in on the daily tasks of planning, teaching, and reflecting on lessons by suggesting a framework and tools for addressing standards, curriculum, principles of learning, and lesson design and assessment. It does not prescribe particular methods or techniques of teaching. (p. 2)

Though specific instructional techniques are not prescribed, the frameworks for coaches to use in coaching conversations with teachers are detailed and focus on examining the mathematics of a lesson and the intended student learning.

The specific focus on mathematics was particularly valuable to me as I began to build images of what coaching conversations in mathematics might sound like given the need to develop content knowledge with teachers. At the same time, the realities of my own coaching context, including time constraints, brought me to a more reflective stance toward content-focused coaching. I began to raise questions and challenge certain dimensions of the model. I needed to develop more flexible models of coaching that still remained true to the essence and intent of content-focused coaching. I also began to encounter teachers struggling with the establishment of classroom culture and classroom management; in some cases, it was impossible to get at the mathematics of a lesson because of these distractions. I needed to consider how to adapt a model of coaching to support these teachers as well.

### **Instructional Coaching**

In his instructional coaching model, Jim Knight (2004) defines an instructional coach as an on-site professional developer who collaborates with educators to identify and assist with implementation of proven teaching methods. The work the instructional coach undertakes entails processes that are purposely designed and carried out over a series of coaching sessions. Enrolling and identifying teachers involves communicating to them the intent of instructional coaching, gauging interest levels among staff, and establishing the critical mass of teachers poised for coaching. Explaining, modeling, observing, exploring, supporting, and reflecting are the vehicles through which the coach supports the teacher in putting given instructional methods into practice in the classroom.

Knight (2007) also gives specific attention to the professional skills that are required in coaching, most notably with regard to communication. He addresses strategies to support active listening skills and body language when meeting with teachers. Moreover, his work is filled with templates: observation forms, teacher meeting logs, and Are You Interested? forms for enrollment. These are templates that build an organizational structure around the work of the coach.

Knight's work pushed me to consider, question, and adapt for myself tools that support the logistics of coaching. From session to session with a teacher, my initial coaching work felt disjointed and seemed to focus on the parts with little sense of how this was all fitting into the whole of the school. Turning attention to the organizational elements allowed me to communicate more effectively with teachers, better organize my time, monitor my work, and provide more focused follow-up and feedback to teachers.

## Pedagogical Content Coaching in Mathematics

David Foster, program director of mathematics for the Noyce Foundation, has presented several papers that articulate the principles and practices that guide the pedagogical content coaching model. This is a model that is utilized for mathematics coaching in the Silicon Valley Mathematics Initiative (SVMI), an extensive project to improve the teaching and learning of mathematics in California. Within the structure of preteaching conferences, in-class experiences, and postlesson conferences, the focus of pedagogical content coaching is on students' thinking, understandings, and work products (SVMI, 2007a). Coaches vary the roles they play from modeling to team teaching to leading; in this model, the work of the coach can entail in-classroom coaching as well as facilitation of mathematics professional development meetings for teachers or administrators.

The fundamentals of successful coaching in the pedagogical coaching model parallel those noted in the case of Ann earlier in this chapter:

- A trusting relationship between the coach and teacher
- Time for preparation and reflection
- Clearly defined roles, responsibilities, and expectations
- Effective listening skills
- Strategic questions that promote thinking
- Data collection and thoughtful feedback related to teacher and student behaviors

These fundamentals marry the *content* of content-focused coaching with the attention to communication strategies found in Knight's instructional model. In this way, the pedagogical content coaching model strikes a balance that calls for an emphasis on reflection but recognizes the multiple roles that a coach may play based on the needs of and relationships with the teacher.

## KEYS TO DEVELOPING A COACHING MODEL

As described in this chapter, there are several models that can inform the work of a mathematics coach; a coach can choose any one of these models to study and emulate in practice. At the same time, coaching is situational work that is impacted by the constraints of a school's context. Learning communities are at different stages of development in different districts or schools, and a coach needs to take this into consideration when embarking on the work.

Mathematics curricula in one district may set a foundation for rich discussions of student work that the coach can build upon with teachers. In another district, a given math textbook may offer little springboard for

conversations about student thinking. An administrator in one school may have spent the past two years establishing structures that provide teachers with time to meet as grade-level teams and with curriculum-based coaches, opening teachers' minds to the value of coaching sessions and reflection. In another school, teachers may have neither common planning time nor any experience with structures that support professional dialogue. Such a wide range of possible contexts makes it difficult to simply transplant a particular coaching model from one school or district to another.

But being aware of the essential or exemplary elements of coaching that must be present in order for coaching to be effective—elements that were noted in Ann's case and throughout the research cited in this chapter—allows a coach to make informed decisions about the work under any condition or context. Knowledge of these essential elements, coupled with knowledge of multiple coaching models, allows a coach to intentionally design an effective coaching model that best meets the needs of his or her specific context and circumstances. What's more, given the dynamic nature of learning environments for students and adults, it is likely that the model will need to be fluid and will continually evolve over time.

### Questions for Reflecting and Linking to Practice

1. This chapter opened with the question: What is coaching? Revisit your initial response to that question after reading this chapter. What new perspectives or insights do you now have?
  2. Now consider the question: What is coaching *not*?
  3. What new questions have emerged for you from this opening chapter? Use these questions to frame and focus your reading of the chapters ahead.
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