Designing Mathematics Coach Professional Development to Support Improvements in the Quality of One-on-One Coaching

Metro Nashville Public Schools

Vanderbilt University
Agenda

• Background
• Overview of Coach PD Design Study
• Closer Look at PD Design Study
  – Engaging Teachers in Evidence-Based Debriefs
• Stepping Back: Lessons Learned & Implications
• Questions
Research Background

- **Prior research:** Identify potentially productive instructional improvement strategies
  - District leadership
  - School leadership
  - Coherent instructional system

- **Current work:** Reliably implement improvement strategies
Current Partnership

- Research practice partnership between researchers at Vanderbilt University and Metro Nashville Public Schools (MNPS).

<table>
<thead>
<tr>
<th>MNPS Schools:</th>
<th>MNPS Students:</th>
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<tbody>
<tr>
<td>74 elementary (K - 4)</td>
<td>~86,000 students</td>
</tr>
<tr>
<td>30 middle (5 - 8)</td>
<td>• Diverse student population</td>
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<tr>
<td>24 high (9 - 12)</td>
<td>• Economically Disadvantaged: 43%</td>
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<tr>
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<td>• Limited English Proficiency: 24%</td>
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Current Partnership

- **Shared goal:** Support secondary mathematics teachers to improve their teaching, and thus improve students’ learning

  - One-on-One Coaching
  - PLCs
  - PD for teachers

  **Improvements in teaching**

  **Students’ learning** (conceptual understanding & procedural fluency)
Initiative: Supporting Coaches’ Professional Learning

• Supporting teachers in improving their instructional practices is demanding work that involves significant coach learning and requires sustained support.

• Monthly pull-out professional development sessions aimed at supporting coaches’ learning
  – Eight sessions spread out over the school year
  – Novice and returning coaches
  – 35 Elementary, middle, and high school coaches
Overview of Coach PD

- Each coach PD session includes:

<table>
<thead>
<tr>
<th>Topic</th>
<th>Coach Learning Goal</th>
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<tbody>
<tr>
<td>Doing Mathematics</td>
<td>• deepening their mathematical knowledge for teaching (MKT)</td>
</tr>
<tr>
<td>Small Group Book Study</td>
<td>• provide differentiated learning opportunities for new and returning coaches to deepen the vision for high-quality math instruction</td>
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<tr>
<td>Coaching Groups of Teachers</td>
<td>• understanding and effectively facilitating PLCs</td>
</tr>
<tr>
<td>One-on-One Coaching</td>
<td>• understanding and effectively implementing one-on-one coaching cycles</td>
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Supporting the Effective Implementation of One-on-One Coaching

- How can mathematics coaches be supported to effectively implement one-on-one mathematics coaching cycles with teachers?

- What are barriers to implementing one-on-one coaching cycles?
  - Vision of high-quality one-on-one coaching
  - Purpose of each phase in one-on-one coaching cycles
  - Limited time to work with teachers
  - Administrative demands coming from school principal
Overarching Goal: One-on-One Coaching Cycles

- Debrief (e.g., analyze instruction, set new goals)
- Co-planning (e.g., set goals, select tasks)
- Classroom Instruction (e.g., model, co-teach, observe)

Russell et al., 2016
Overarching Goal: Ongoing Coaching Cycles

- **Debrief**: (e.g., analyze instruction, set new goals)
- **Co-planning**: (e.g., set goals, select tasks)
- **Classroom Instruction**: (e.g., model, co-teach, observe)

Russell et al., 2016
Issues for Effectively Implementing Coaching Cycles

• Co-planning with teachers
  – Pressing teachers to make connections between content learning goals, students’ thinking, and their instructional plans.

• Engaging teachers in evidence-based debrief conversations
  – Supporting teachers to investigate what students learned and why they learned it.
  – Supporting teachers to identify next steps based on that analysis.

Check out the app for more!
Activity: Investing Effective Debriefing Conversations

• Case study
  – Investigation of effective coaching practice

• Materials:
  – Background information
  – Task
  – Students’ work
  – Excerpts from a transcript of a coach-teacher debrief
Directions

• Review the background information, task, and students’ work.

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**Case Study: Coach-Teacher Debrief Conversation**

**Background:**

**Student learning goal(s) discussed in the co-plan:**
- Multiply and divide fluently
- Understand that multiplying and dividing are inverses of one another
- Engage in a multi-step, open-ended task

**Pedagogical learning goal(s) discussed in the co-plan:**
- Launch tasks without diminishing their cognitive demand
- Students doing most of the talking throughout the lesson

**Math Task**
Carla wants to bring cake pops to her friend’s birthday party. At the grocery store, she finds that cake pops come in trays of 12. Carla buys 4 trays. If there are 8 children at her friend’s birthday party, how many cake pops does each child get?

**Students’ Work:**

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Partner Talk (2 min)

• What do you notice about students’ solution strategies?
• Why would this information be useful for a coach?
Directions

• Read the transcript.
• Consider these guiding questions:
  – What topics did the coach and teacher talk about in the
debrief conversation? In what order?
  – Why do you think the coach and teacher discussed these
topics? Why in that order?
Partner Talk (3 min)

- What topics did the coach and teacher talk about in the debrief conversation? In what order?
- Why do you think the coach and teacher discussed these topics? Why in that order?
Key Takeaways

- Understand what students actually learned in the lesson
- Understand the extent to which students made progress toward student learning goals
- Explain why students learned what they learned
- Understand how instruction contributed to students’ learning
- Clarify what went well in the lesson and what the teacher might work to improve
- Identify specific next steps for students’ learning and teachers’ improvement
# Simple Coaching Tool: Range of Solutions

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<th>Strategy: ___________________________</th>
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Partner Talk (2 min)

• How might this tool be useful in *preparing for* a debrief conversation?
Data Collection

- Coaches implemented one-on-one coaching cycles between pull-out PD sessions.
- Collected data on a subset of coaches.
Data Collection

- Coach Interview & Teacher Interview
- Observe & Audio Record
- Observe & Audio Record
- Observe & Field Notes

Debrief (e.g., analyze instruction, set new goals)

Co-planning (e.g., set goals, select tasks)

Classroom Instruction (e.g., model, co-teach, observe)
Initial Findings: Coaches’ Practices

- Coaches are now implementing all phases of one-on-one coaching cycles

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<tr>
<th>Coaching Cycle</th>
<th>Baseline (% coaches)</th>
<th>Current (% coaches)</th>
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<tbody>
<tr>
<td>Full Cycle</td>
<td>57%</td>
<td>100%</td>
</tr>
<tr>
<td>Two Phases</td>
<td>29%</td>
<td>0%</td>
</tr>
<tr>
<td>One Phase</td>
<td>14%</td>
<td>0%</td>
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- Improvements in the quality of one-on-one coaching cycles.
  - E.g., almost all debriefs concluding with next steps for teachers’ improvement of their instructional practices
Lessons Learned

• Some coaches were still developing an understanding of high-quality mathematics instruction and productive views of students’ current mathematical capabilities.

• Our approach:
  – Explicit discussions of high-quality mathematics instruction and its importance for supporting students’ learning
  – Embedded discussions of mathematics teaching and students’ mathematical thinking in the coach PD sessions.
Lessons Learned

• Many coaches were not implementing one-on-one coaching cycles.

• Our approach:
  – Collected information on the reasons *why* coaches were not implementing coaching cycles (e.g., too little time, not seeing the purpose of one-on-one coaching)
  – Framed each session around the purpose of one-on-one coaching and each phase of coaching cycles
  – Provided job-embedded support for coaches’ implementation of coaching cycles (i.e., coaches of coaches)
Lessons Learned

• Effectively implementing one-on-one coaching cycles requires planning and thinking *outside of* direct interactions with teachers

• Our approach:
  – Developed PD activities designed to foster conversations between coaches about the thinking required to effectively implement one-on-one coaching cycles
  – Developed structures and routines for coaches to collaborate together and discuss their thinking with one another
Implications for District-Wide Coaching Initiatives

• The job description should be aligned to research-based coaching practices.

• Coaches should be screened prior to hire
  – vision of high-quality instruction
  – understanding of the coaching role
  – views of current students math capabilities.

• Supports for coaches’ learning should address:
  – enactment of coaching activities
  – planning for coaching activities.

• Be proactive in addressing barriers to coaching
Questions?

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