Becoming a Consumer of Mathematics Coaching: Expectations and Responsibilities

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Colorado Council of Teachers of Mathematics
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SESSION AGENDA

- Overview of Examining Mathematics Coaching (EMC) project
- Coaching practices
- Framework for consumers of coaching
- Tools to maximize coaching effectiveness
Who is in the Audience?

- Classroom Coach …
- Teacher being coached …
- Administrator …
- Interested in coaching …
Mathematics Coaching

Mathematics classroom coaching is gaining popularity as a school-based effort to increase teacher effectiveness and student achievement.
Why Study Coaching?

- Coaching is a promising model for enhancing mathematics teachers’ abilities to provide quality mathematics education.

- Coaching can be implemented at any point in a teacher’s career (as opposed to mentoring).
WHY STUDY COACHING?

The National Mathematics Panel (2008) reports that schools across the nation are using mathematics specialists, including mathematics coaches, yet there is limited research proving what makes coaching effective.
Why Study Coaching?

- There is limited understanding of coaching effectiveness, especially in mathematics.
- Moreover, no studies have demonstrated what types and depths of knowledge effective coaches hold.
- At the same time, implementing coaching involves considerable cost and logistical effort for schools and districts.
EXAMining Mathematics Coaching Project

EMC is a five-year research and development project funded by NSF examining the effects of a coach’s “knowledge for coaching” on a diverse population of K-8 teachers.
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THE EXAMINING MATHEMATICS COACHING PROJECT (EMC)

- Investigating knowledge that contributes to successful coaching in two domains:
  - Coaching knowledge
  - Mathematics content knowledge
- The influence of these knowledge domains is examined in two ways:
  - investigating correlations between assessments of coach and teacher knowledge and practice in each domain.
  - investigating causal effects of targeted professional development for coaches.
Knowledge Domains

- Knowledge of Student Learning
- Knowledge of Teacher Learning
- Coaching Knowledge
- Mathematics Content Knowledge
EMC Research Hypothesis

- Effectiveness is linked to several domains of knowledge.
- Coaching knowledge and mathematics content knowledge contribute significantly to a coach’s effectiveness.
- Effectiveness is measured by the positive impact on teacher practice, attitudes, and beliefs.
With the person next to you, or with a couple of people around you, take a moment and share your thoughts about the skills a mathematics coach needs by completing the following sentence starter:

A mathematics coach is …
Ten Roles for Coaches
(Killion, 2009)

- Data coach
- Resource provider
- Mentor
- Curriculum specialist
- Instructional specialist
- Classroom supporter
- Learning facilitator
- School leader
- Catalyst for change
- Learner
MATHEMATICS COACHING DEFINED

A mathematics coach is an **on-site professional developer** who enhances teacher quality through **collaboration** focusing on **research-based, reform-based, and standards-based instructional strategies and mathematics content** that includes the **why, what, and how** of teaching mathematics.
EFFECTIVE COACHING PRACTICE

A coach should:

- Ask reflective questions
- Provide feedback
- Share materials and resources
- Maintain confidentiality
- Use a coaching cycle:
  - Gather information before the lesson
  - Observe a complete lesson
  - Collect and document evidence
  - Debrief and reflect after the lesson
# EMC Coaching Model

| Coaching Cycle | **Pre-conference** of at least 15 minutes focused on planning for upcoming lesson with emphasis on teacher’s stated goals, objectives, and needs  
|                | **Observation** or model of a lesson  
|                | **Post-conference** of at least 30 minutes reflecting on planned teacher actions  
|                | Coaching will focus on aspects of standards-based teaching as defined by NCTM process and content standards, not on generic pedagogy such as classroom management |
| Content Focus  | Number and Operation; Ratio and Proportion |
| Frequency      | Three teachers per coach provide data points for research. Teachers are coached at least 8 times per academic year with at least four of those times within the content focus. |
| Quality Assurances | Coach and teacher reflection instruments, coach skill inventory, and teacher needs inventory ensure consistent implementation of coaching across schools  
|                | Self-identified teacher needs are used in planning and goal setting, and progress toward these goals is monitored and reflected on by coaches. |
BOUNDARIES OF COACHING

A coach generally does not:

- Evaluate teachers.
- Take over during a lesson.
- Impose specific lessons or instructional strategies.
- Tutor struggling students.
- Perform the support services of an aide.
COMPLEXITY OF COACHING

- Coaching is a collaborative process that is done with teachers, not to teachers.

- Coaching is a joint effort from both the coach and the teacher(s) involved.

- Coaching support is useful only if the teacher and coach are prepared, and willing to listen, internalize, and respond accordingly.
What’s Missing from the Picture?

- Burden of the **partnership**, **relationship**, and **collaboration** is on the coach only.

- Coaches are only as effective as their teachers will allow.
BECOMING CONSUMERS OF COACHING

A commitment to creating a collaborative and rewarding coaching relationship will help maximize the benefits of coaching.

- A wise consumer of coaching makes the most of this educational investment.
- Consumer of coaching addresses the teacher’s role in coaching process.
BECOMING CONSUMERS OF COACHING

Discuss with a neighbor:

What might be the expectations for teachers who are being coached in order to make coaching effective and collaborative?
CONSUMER OF COACHING FRAMEWORK

- Feedback
- Reflection
- Communicating needs
- Classroom expectations
- Content-based
- Structure
FEEDBACK

■ Effective coaching requires feedback.

An effective consumer of coaching asks the coach for targeted feedback.
Coaching is a reflective process.

An effective consumer of coaching is open to reflection and is an active participant in the reflective process.
COMMUNICATING NEEDS

- Effective coaching requires teachers to communicate their needs.

  An effective consumer of coaching tells the coach what he/she needs.
Effective coaching requires teachers to communicate their expectations for coaches as the lesson transpires.

An effective consumer of coaching tells their coach what kind of classroom interaction he/she desires.
Effective coaching is content-based.

An effective consumer of coaching is willing to examine her or his own mathematics content knowledge.
Effective coaching is structured and involves at least three components: a pre-lesson conference, a lesson observation, and a post-lesson conference.

*Effective consumers of coaching help coaches schedule the 3-part cycle.*
CONSUMERS OF COACHING ARE ABLE TO:

- assess their own needs;
- assess their performance;
- ask for help from others;
- provide context as needed;
- listen to and hear ideas;
- overcome anxious feelings;
- assess and communicate needs;
- assist in scheduling.
The Examining Mathematics Coaching (EMC) project has developed and refined tools to help coaches and teachers in the coaching process.

- Coaching Skills Inventory
- Teacher Needs Inventory
- Reflections (Coach and Teacher)
EMC Coaching Skills Inventory

…is intended to measure a coach’s perspective on his/her own level of effectiveness or confidence with various coaching responsibilities.
EMC Coaching Skills Inventory

Areas explored include:

- Coach/Teacher relationships
- Coaching skills
- Mathematics content
- Mathematics-specific pedagogy
- General pedagogy
- Background & practices as an educator
# EMC Coaching Skills Inventory

## I. Coach/Teacher Relationships

<table>
<thead>
<tr>
<th></th>
<th>Not at All Effective</th>
<th>Very Effective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How effective do you feel observing lessons and giving teachers feedback?</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>2. How effective do you feel creating environments where teachers reflect openly on their instructional practices?</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. How effective do you feel helping teachers set goals and objectives aimed at improving their instruction?</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>4. How effective do you feel creating an environment of open discussion and constructive criticism with teachers?</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
EMC Teacher Needs Inventory

...is designed to help the teacher take ownership of the coaching process.

The responses are used by the coach as a tool to help focus the coaching and increase effectiveness.
Areas explored include:

- Teaching conceptual/inquiry-based lessons
- Classroom environment
- Conceptual understanding of mathematics
- Mathematics content knowledge
- Classroom management
EMC Teacher Needs Inventory

IV. Mathematics Content Knowledge

<table>
<thead>
<tr>
<th>Question</th>
<th>Scale</th>
<th>Not at all Confident</th>
<th>Very Confident</th>
</tr>
</thead>
<tbody>
<tr>
<td>15. How confident are you with the mathematics you teach?</td>
<td>1, 2, 3, 4, 5</td>
<td>O O O O O</td>
<td>O O O O O</td>
</tr>
<tr>
<td>16. How confident are you with the mathematics beyond the mathematics that you teach, meaning the next grade level?</td>
<td>1, 2, 3, 4, 5</td>
<td>O O O O O</td>
<td>O O O O O</td>
</tr>
<tr>
<td>17. How confident do you feel planning lessons that include fraction concepts?</td>
<td>1, 2, 3, 4, 5</td>
<td>O O O O O</td>
<td>O O O O O</td>
</tr>
<tr>
<td>18. How confident do you feel planning lessons that include number sense and operations?</td>
<td>1, 2, 3, 4, 5</td>
<td>O O O O O</td>
<td>O O O O O</td>
</tr>
</tbody>
</table>
## EMC Teacher Needs Inventory

How confident do you feel using cooperative learning?

<table>
<thead>
<tr>
<th>Not at all confident</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>Very confident</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>I would not like to partner with coach on this topic.</td>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
<td>I would like to partner with coach on this topic.</td>
<td>[ ]</td>
<td></td>
</tr>
</tbody>
</table>
EMC Coach & Teacher Reflections

... are tools for monitoring and logging coaching interactions.

- Quantity, quality, and duration of coaching sessions
- Coaches and teachers’ perceptions of coaching’s impact on instruction
EMC COACH & TEACHER REFLECTIONS

Areas explored include:

- Interactions with the coach / teacher
- Frequency of various activities:
  - pre-lesson conference,
  - observation,
  - post-lesson conference,
  - modeling a lesson, etc.
EMC Coach & Teacher Reflections

Areas also explored:
- Mathematics content
- Mathematical concept and inquiry
- Classroom environment/culture
- Reflection and planning
- Impact on teacher practice
### Mathematics Content

<table>
<thead>
<tr>
<th>Mathematics Content</th>
<th>Not at All</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. The teacher and I discussed significant and worthwhile mathematical content.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>b. The teacher and I discussed mathematical content at the grade level(s) she/he teaches.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>c. The teacher and I discussed ways to increase the level of cognitive demand of the mathematical content being taught.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>d. The teacher and I discussed mathematical content beyond the grade level(s) she/he teaches.</td>
<td></td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>
## EMC Teacher Reflection & Impact

### Reflection and Planning

<table>
<thead>
<tr>
<th>Reflection</th>
<th>Not at All</th>
<th>To a Great Extent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>o.</strong> My coach and I set goals and objectives aimed at implementing ideas and addressing issues we discussed.</td>
<td>0</td>
<td>0 0 0 0 0 0</td>
</tr>
<tr>
<td><strong>p.</strong> My coach and I were reflective about my students’ learning.</td>
<td>0</td>
<td>0 0 0 0 0 0</td>
</tr>
<tr>
<td><strong>q.</strong> My coach and I were reflective about my teaching practices.</td>
<td>0</td>
<td>0 0 0 0 0 0</td>
</tr>
</tbody>
</table>
BECOMING A CONSUMER OF MATHEMATICS COACHING: EXPECTATIONS AND RESPONSIBILITIES

- Questions ???
- Insights …
- Ideas …
- Comments …
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