Case Study: Value-Added Benefit of Distance-Based Instructional Coaching on Science Teacher’s Inquiry Instruction in Rural Schools

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Abstract & Theoretical Framework

Abstract: The purpose of this case study was to determine the value-added benefit of coaching over a summer institute alone. The results showed that appropriation and transformation as learning seemed to effectively occur during the coaching sessions.

Theoretical Framework: Vygotsky Space

Research Question

What is the value-added benefit of coaching science inquiry over a summer institute alone?

Methods

Case Study

- Teacher Kara in a Nebraska rural school
- 6 groups of 7th grade students
- Teaching the same lessons

Data

- Teacher & coach interviews
- 11 purposely selected classroom videos
- Timeline of instructional videos analyzed:
  - Video 1 & 2
  - Student Group 1: May, 2012
  - Student Group 2: June, 2012
  - Student Group 3: Sep, Oct, 2012
  - Student Group 4: Nov, Dec, 2012
  - Student Group 5: Apr, May, 2013

Data Analysis

- Interviews: Constant Comparative Analysis (CCA)
- Classroom videos:
  - Teacher Inquiry Rubric (TIR)
  - Electronic Quality of Inquiry Protocol (EQUIP)
  - Partial Interval Classroom Inquiry Observation System for Teachers (PICI-T)
- Science Classroom Discourse Analysis (CDAT)
- Inter-rater reliability: TIR (Kappa = .74), EQUIP (Kappa = .73), and PICI (Kappa = .88)

Case Study Results

TIR

Level of inquiry instruction

Exemplary Inquiry (4)

Proficient Inquiry (3)

Developing Inquiry (2)

Pre-Inquiry (1)

Video

Pre-SI & Pre-Coaching

During Coaching

Post-Coaching

CDAT

Classroom discourse analysis part of a class of each phase:

<table>
<thead>
<tr>
<th>Discourse Component</th>
<th>Everyday Reasoning (EDR)</th>
<th>Knowledge</th>
<th>Scientific Reasoning (SR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>NC</td>
<td>Experience</td>
<td>Naive Knowledge</td>
</tr>
<tr>
<td>Question/Prompt</td>
<td>Discourse Pattern: Iterative IRF</td>
<td>(Kappa = .88)</td>
<td>1, 2, 3, 4, 5, 6</td>
</tr>
<tr>
<td>Student Response/Question</td>
<td>Feedback level: Level 2 corrective</td>
<td>Content area: Observation, Data, and Patterns of Data</td>
<td>1, 2, 3, 4, 5, 6</td>
</tr>
</tbody>
</table>

SICI: Coaching Science Inquiry in Rural Schools

- Randomized controlled trial conducted through IES funded REd
- 119 teachers over two years (2012-2014)
- 2-week summer institute (June, 2012 & 2013)
- 8-16 distance-based instructional coaching sessions (2012-2013 & 2013-2014) by 4 CSI instructional coaches
- Video-recorded classroom instruction
- Distance technology delivered coaching

Data Collection

- Coaching System for Teachers
- Coaches: Coaching Science Inquiry in Rural Schools (CSI)
- Timeline of instructional videos analyzed:
  - Video 1 & 2
  - Student Group 1: May, 2012
  - Student Group 2: June, 2012
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  - Student Group 4: Nov, Dec, 2012
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Data Analysis

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PICI-T

Percentage of inquiry instruction in the first class of each phase:

- Pre-SI
- Post-SI & Pre-Coaching
- During coaching
- Post-coaching

EQUIP

Level of inquiry instruction

Exemplary Inquiry (4)

Proficient Inquiry (3)

Developing Inquiry (2)

Pre-Inquiry (1)

Video

Pre-SI & Pre-Coaching

During Coaching

Post-Coaching

Discussion

The value-added benefit of the instructional coaching:
- Level of inquiry instruction increased and maintained
- More discussion with students and less lecturing
- Changes in discourse pattern from IRFIRF to IRRFRRFRRR...
- Insightful Appropriation and Enhanced Transformation