Elevating the Capacity of Classroom Experiences for Promoting Students’ Learning and Development: Observation and Improvement of Teacher-Child Interactions

Robert C. Pianta, Ph.D.
Dean, Curry School of Education
Director, Center for Advanced Study of Teaching and Learning

Developmental science in school settings

- Schools are settings for development – connecting an understanding of human development in context with schools/classrooms as contexts

- Understand and identify mechanisms of influence, then build systems to better harness potential of schools/classrooms as developmental assets

- Classrooms are the central focus/feature/leverage point – evidence from multi-level models of achievement and student report

- What are processes in classrooms that matter?
Aims of today’s talk

- What experiences for social and cognitive development are offered to young students in classroom settings?
- Do interactions with teachers and experiences in classrooms matter for students?
- Can observation leverage efforts to improve the richness, quality, and effectiveness of experiences in classrooms?
- Can we use observation of teacher-student interactions to improve student learning?
- Further examination and extension in basic and applied scientific work
Start with teachers and teaching

- In U.S. right now a good teacher is a matter of luck.

- Tests show teachers/teaching are key, but tests cannot produce learning—posting scores, firing teachers won’t help.

- Teachers can narrow gap by half or more/year. K-teacher can return up to $320,000 to a child she serves. Start early.

- U.S. districts spend between $2500 and $9,000/teacher/year on improvement. No evidence of impacts. Nor evidence of impact of advanced degrees, pay, etc.

- Move from luck to guarantee—the production of effective teaching. Scale is important—we need many effective teachers
Improve quality, impact for young children

- Poor children enter kindergarten far behind their peers, despite increased investment in HS and PK

- Even with universal access, learning gaps still exist. Need access to experiences of sufficient intensity to foster learning.

- Interactions between teachers and children are the ingredient that fosters learning and development; Interactions = Quality

- Issue is access and quality
Child-adult relationships/interactions

- Early history of relationships with adults forms “infrastructure” for school success:
  - Social competence with peers
  - Self-regulation, emotional self-control
  - Task orientation, persistence, following directions

- Readiness is, in part, a social process:
  - Interactions and relationships with teachers are a “medium”

- Relationships and interactions with teachers and caregivers determine quality and value of early education and are vehicles for improving readiness.

- Standardized, observational assessments
Teacher-Child Interactions (these matter)

- Emotional Support
- Classroom Organization
- Instructional Support
Measuring interactions: CLASS

- CLASS is a tool for observing and assessing the quality of interactions between teachers and students.

- Ratings (1-7) of the *emotional, organizational, and instructional supports* provided by teachers that contribute to children’s *social, developmental, and academic achievement*.

CLASS is used to assess interactions among teachers and students for a variety of purposes:

- Teacher Professional Development
- Monitoring and Evaluation of Teacher Performance/ Effectiveness
- Research
Dimensions of interaction: CLASS PK-5

- Positive climate
- Negative climate
- Teacher sensitivity
- Regard for student perspectives

- Effective behavior management
- Instructional learning formats
- Productivity

- Concept development
- Quality of feedback
- Language modeling

Emotional Support
Organization/Management
Instructional Support
Observations at the population level in US early education
## Interactions and children’s PK development

<table>
<thead>
<tr>
<th></th>
<th>Emotional Support</th>
<th>Instructional Support</th>
<th>ECERS-R Total</th>
<th>Structural</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Receptive Language</strong></td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Expressive Language</strong></td>
<td>☑</td>
<td>☑</td>
<td>☑</td>
<td></td>
</tr>
<tr>
<td><strong>Rhyming</strong></td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Letter Naming</strong></td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Math Skills</strong></td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Social Competence</strong></td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Behavior Problems</strong></td>
<td>☑</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Changes** in children’s development from beginning to end of preschool

Mashburn, et al. (in press)
Yes, children in pre-k classrooms offering higher levels of Instructional Support displayed better language skills at the end of the kindergarten year.

Kindergarten Instructional Support scores made an independent contribution to gains in children’s language and math abilities.
Is there an “active range” for effects?

- Analysis of “thresholds” – points on distribution where impacts are evident
- Emotional Support – “5” and above
- Instructional Support – “2” and above
- For Instructional Support, the active range appears linked to teachers’ support for children’s cognitive skills
- One-point shift appears meaningful
Interactions are really important for...

...children from low-income families and those who have difficulty adjusting to classroom environments may particularly benefit from exposure to high-quality early learning environments as defined by the CLASS.
Gains in grade 1 achievement in instructionally supportive classrooms

1st Grade Instructional Support

Standardized tests of achievement adjusted

High educ.  Low educ.
Gains in grade 1 achievement in emotionally supportive classrooms

Kindergarten adjustment problems
- No problems
- Multiple problems

1st Grade Emotional Support

- Low
- Moderate
- High

Standardized tests of achievement adjusted

<table>
<thead>
<tr>
<th>Kindergarten adjustment problems</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td>No problems</td>
<td>105</td>
<td>105</td>
<td>105</td>
</tr>
<tr>
<td>Multiple problems</td>
<td>101</td>
<td>104</td>
<td>107</td>
</tr>
</tbody>
</table>
Biological processes and interactions

- Emotional sensitivity of teachers predicts decline in child stress hormones (cortisol) over the day and lower total (in context of typical rise in levels).

- Teacher stress reactivity predicts teachers’ interactions and moderates effects of those interactions on child outcomes

- “Banking Time” intervention increases teacher sensitivity
  - Focused training for reading child cues
  - Seeing decrease in cortisol for both teachers and children
  - Increases in child engagement, affiliation, cooperation
Interactions matter – Improve at scale

- Specifically link inputs to teachers with their interactions with children
- CLASS – specific definitions of interactions
- Video Library – analysis of others’ interactions
- Coaching – ongoing analysis/feedback on own interactions
- Course – knowledge and analytic skills
- All tested in RCTs
Welcome to our video library of CLASS constructs. Listed below are the 11 areas of CLASS that we have chosen to focus on and explain further through video demonstrations. You'll get a chance to view teachers interacting with their students in a real-life class setting, while displaying some of the positive behaviors we associate with the various CLASS categories.

Select from the pulldown or pick one of the main categories below.
Teacher Sensitivity to Child’s Shyness

A child who is asked to talk to the group is reluctant to respond in front of the group. To maximize the child’s feeling of success and encouragement, the teacher uses verbal and non-verbal strategies, such as touch and a gentle tone of voice. The teacher's close physical proximity appears reassuring to the child. The teacher begins with an open-ended question and moves to a yes/no question when the child is hesitant to respond. The teacher goes further to provide the information to the class on behalf of the child. She ends the child's turn with an extra touch of reassurance, and a thank you. This child is probably more likely to respond to these types of requests than if she was not offered this support, and maybe the next time she will speak more.
MTP coaching cycle

1. Classroom video recording at an established time
2. Consultant reviews and edits video clips
3. Teacher reviews clips and reflects on practice
4. Teacher and consultant meet and discuss teaching practices
Nice Work

**PROMPT #1:**

When teachers anticipate and respond to students’ academic, emotional, and social needs, they demonstrate Teacher Sensitivity. What do you see yourself doing in this clip that reflects your understanding of the difficulty the students may have in writing their personal narratives?

**DIMENSION FOCUS:**

Learn more about Teacher Sensitivity before reviewing this clip and submitting your response. **Clicking on this link should open up a new browser.**

**<<<PLAY VIDEO :**

Roll over the video and press the play button below to being.

**YOUR RESPONSE:**

Submit My Response
MTP Coaching improves interactions
Classrooms with high poverty benefit more from MTP coaching for teachers.
Findings: Effects of MTP support in PK

**Teachers with MTP coaches**
- Grew more sensitive in interactions with students
- Increased students’ engagement in instruction
- Improved language stimulation techniques
- High-poverty classrooms benefit a great deal
- Early career teachers benefit from coaching and video

**Children with MTP teachers**
- Made greater gains in tests of early literacy
- Experienced lower levels of problem behavior
- Demonstrated higher levels of expressive language
NCRECE professional development study

NCRECE evaluates two PD supports:

- In-service course on effective interactions for language/literacy
- In-service coaching using MyTeachingPartner
During coaching phase, 4 children (2 boys, 2 girls) were randomly selected from each classroom for assessments.
Teachers: N = 506

- 45% with Bachelor’s degree, 42% with AA or less
- 13% with Master’s degree
- Mean years teaching preschool: 11.3 (s.d., 7.8)
- Ethnicity: African American 47%; White 33%; Latina 9%; Asian 3%; Other 8%
- 10 early ed sites, mostly urban, 60% HS
- Higher education partners at each site
Course focus and aims

- Identify connections between teacher-child interactions, child development, and learning
- Describe elements of effective teaching as defined by Classroom Assessment Scoring System (CLASS)
- Accurately observe effective and ineffective interactions with children using CLASS
- Describe implementing language and literacy curricula through effective teacher-child interactions
Course impacts on beliefs, knowledge, skill

- Teaching Belief
- Teaching Knowledge
- Skill in Seeing Effective Interactions

* p < .05; ** p < .01; *** p < .001
Course impacts on teaching practice

Effect Size

* *p<.05; ** p<.01; ***p<.001

- Emotional Support
- Classroom Organization
- Instructional Support

After Course
1 Yr Later
The importance of “Seeing”
What did we learn from course?

- Teachers demonstrated changes in beliefs, knowledge, skills and practices
- Effects on practice were strongest for instructional interactions – were sustained 1 year later
- Course was effective for a range of teachers
- Course promoted better interactions in the classroom through increasing teachers’ observation skills (VAIL) – can be trained
MTP coaching protocol

- Scale-up to 10 sites, train and support local coaches
- Focus most of coaching cycles on Instructional Support behaviors.
- Standardize sequence of exposure
Coaching impacts on emotional support

- Positive Climate: n.s.
- Negative Climate: n.s.
- Teacher Sensitivity: n.s.
- Regard for Child Perspectives: *p<.05

*p<.05; ** p<.01; ***p<.001
Coaching impacts on instructional support

* * *

*p<.05; ** p<.01; ***p<.001
Dose-response analysis of coaching effects

- **Dose**: Accumulating exposure to: a) video b) prompts in each of 3 CLASS domains.

- **Response**: Incremental (cycle) changes in CLASS in 3 domains. Test average and non-linear effects

- **General pattern of increase dose = positive change**
  - Prompts → Instructional Support (15 prompts then level off)
  - Video → Emotional Support (16 minutes before see increase)

- **Do benefits vary with quality of implementation?**
Implementation results and implications

- Effective PD interventions can be delivered locally with high fidelity and quality.

- Quality of implementation matters for teacher engagement and for benefits of PD.

- “Implementors” need focused support. Biweekly conference calls, check-ins, standardized protocols all essential to keeping focused.
Effects on child outcomes

- Coursework-coaching tested separately and in combination in Intent-to-Treat analyses
- Child outcomes in coaching year and for children in teachers’ classrooms the following year
- Literacy, language development, self-regulation
- No effects in concurrent (coaching) year
- For children year after coaching, MTP increased self regulation and working memory; and literacy in classrooms with targeted curriculum.
MTP in secondary classrooms

- Same approach – MTP coaching, video library
- Randomized evaluation study – >100 classrooms
- 6th-11th grades, all content areas
- Teachers improved instruction; kids more attentive, engaged
- Average student with MTP teacher improved 10 percentile ranks on state high-stakes standards tests
- Replicating results in another city
Intentional teaching requires teachers to **know** what to do in each moment, **see** effective teaching in themselves and others, **enact** these strategies in the classroom, and **reflect** on, or analyze what works and what does not.
Active ingredients for changing practice

- Enhanced ability to “see” effective practice in self and others
  - Video library
  - Review of own video
  - Course – focus on ineffective practice as well

- Emotionally supportive context for change
  - Coach & Instructor
  - “Nice Work” prompt in MTP

Professional Development
- Knowledge
- Schemas
- Relationships
Online course components

1. Online Content
2. Analyze Videos of Others
3. Analyze own Video
4. Talk with Instructor
Help teachers “chunk” complexities into 10 key elements of practice

- Dimensions
  - Indicators
    - behaviors

Tightly couple knowledge of interactions with visuals of what it looks like in real classrooms
Analysis of others’ teaching

Your Observation Log

This is a log of the observations you made about the video. Each observation is also marked below on a timeline so that you can compare your observations to ours. Click any observation in the log or on the timeline to get more information.

1. Allows Freedom of Movement (0:12)
2. Gives Children Responsibilities (0:47)
3. Encourages Children to Lead (0:49)
4. Allows Choice (1:02)
5. Gives Children Responsibilities (1:17)

Allows Child Talk

Your Observations:

1
23
4
5

- Allows Choice
- Gives Children Responsibilities
- Encourages Children To Lead
- Allows Child Talk
- Allows Freedom of Movement

Timeline:
0:00 0:10 0:20 0:30 0:40 0:50 1:00 1:10 1:20 1:25
What about making observations?

27 learners
96 tags made: 76 correct, 20 incorrect

Of the 76 correct tags:

74 were tagged in the right time frame

Haven’t analyzed descriptions yet to see what they wrote.

The 15 Social conversation taggers mentioned the teacher talking about the smell of her hand, the remark about the girl’s long hair, or described a conversation related to the hamster.
Standardized observation of interactions

- Feasible, reliable and valid at scale – A scalable language and lens for classroom settings
- Work in K-12 years confirming pk-3 work
- Skill of seeing and labeling interactions and cues appears a key mechanism for transfer to practice; can be measured (VAIL) and trained (MTP)
- Dose-response - inputs to teachers align with domain of outputs. Possible different mechanisms of change for different domains of practice?
- Dose nonlinearity has implications for design of observation-PD triage systems and costs
Align observation with PD resources and feedback to—“move” quality into “active range.”

Not all coaching and observation is effective; must be focused, ongoing, aligned to target behaviors.

A focus for teacher professional development and preparation to increase quality and child outcomes.

Incentives and policies to use effective PD? Certification for competent performance? Systems of “badging” to accrue credits and career path?

Re-design of preparation and support systems.
Appreciation and collaborators

- Institute of Education Sciences support for the National Center for Research on Early Childhood Education
- Eunice Kennedy Shriver National Institute for Child Health and Human Development
- University of Virginia Center for Advanced Study of Teaching and Learning
- Colleagues and collaborators at Frank Porter Graham Child Development Center at University of North Carolina Chapel Hill; UCLA, UNC-Greensboro.
- Dozens of partner programs and districts and the hundreds of teachers who have worked with us