Improving Impacts of Classrooms: Observation of teacher-child interaction and professional development

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Pressing concerns

- What are the ingredients of a high-quality classroom?
- What is a high-quality teacher?
- Can public schools effectively address performance gaps among students and morale problems among staff?
- Can training make a difference for the quality of schooling?
- Can we approach these questions scientifically?
Large-scale observations of classrooms

- Methods, decisions, results
- What is the experience of children in preK–5th grade?
- Are these experiences related to structural features of classrooms?
- In what ways do these experiences matter for children?
- How can the richness and quality of experiences in classrooms be improved?
Child-adult relationships and schools

- 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

- Instruction is, in part, a social process:
  - Interactions and relationships with teachers are a “medium”
  - Good “instruction” for young children is embedded in relationships
Large-scale observational studies

- National-level studies
  - National Center for Early Development and Learning (NCEDL)
  - NICHD Study of Early Child Care
- Up to 1,000 settings observed at preschool, K, 1, 3 — more than 4,000 classrooms
- Large set of systematic standardized classroom observation in U.S. schools
- All teachers credentialed/certified
Observations at-scale

- Trade-offs and decisions
  - Multiple versus single occasions
  - Length of the “window”
  - Time of day / content of instruction
  - Unit of analysis – global or micro
  - Classroom-level or child-level
  - Training demands and reliability
  - Applicable across diverse settings

- No system can address every concern
- Ultimate criterion is link to child outcomes
Observation systems: Choices

- Typical day or morning
- Classroom-level and child-level focus
- Time-sampled codes
  - Setting and activities (e.g., literacy, math, etc.)
  - Teacher behaviors (e.g., interact w/class, teach academics, etc.)
  - Child behaviors (e.g., engagement, social behavior)
- Global ratings
What to observe?

- Observational codes selected because they predict children’s social and academic skills
- “Value added” effects, controlling for:
  - Family, parent, child factors
  - Prior functioning
  - Prospective and experimental designs
- Confidence that indicators relate to what matters for children’s development
Scientific procedures: Global and micro

- Detailed manual describing codes/procedures
- Master-coded video segment
- Central training of observers
- Post-training practice and feedback
- Videotaped certification test
- Live reliability visits (drift)
- All visits scheduled on a typical day
- Multiple visits to some rooms
Can measurements be useful?

- For policy
  - Scalable, reliable, valid, coarse distinctions

- For program / professional development
  - Reliable, valid, articulated in experience of practitioners

- Scale
  - Operate consistent across exceptional variation
  - Reality of program / classroom is variation
  - High level of need for technical support and training infrastructure
  - Web solutions
Program/professional development

- Behaviorally anchored – very clear articulation of constructs in behavior
- Malleable, change and growth are possible
- Change is detectable using measurement scaling
- Change is valid in relation to professional development aims and measure of quality
  - P.d. inputs should create intended changes in quality
- Scalability of professional development
- Motivational aspects of professional development
  - Improvement or compliance?
Describing opportunities to learn: Counting behaviors, activities, practices

- Vast majority of interaction/activity is whole group or individual seatwork
- Few, if any, social or instructional interactions between teacher and individual child
- Mostly literacy (50%-90% of instruction)
- Exceptional variation within and across grades and classrooms
- Similar patterns from pre-k to 5th grade
Rating interactions: What is the CLASS?

- Focus on teachers’ interactions with students
- What the teacher is doing to promote the positive emotional, social, and academic development of students in the classroom
- Three broad domains, consistent pk-12:
  - Emotional Support
  - Organization / Management
  - Instructional support
Classroom ratings: CLASS PK-5

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

- Effective behavior management
- Learning formats/engagement
- Productivity

- Concept development
- Evaluative feedback
- Language modeling

Emotional Support

Organization/Management

Instructional Support
**Emotional Support**
- Positive climate
- Negative climate
- Sensitivity
- Regard for student perspective

**Classroom Organization**
- Clear expectation, Proactive, Redirection
- Maximize time, Efficient routines and transitions
- Variety, Promote student interest, Clarity, Engaging

**Instructional Support**
- Analysis/reasoning, Creativity, Integration
- Feedback loops, Encourage responses, Expand performance
- Conversation, Open-ended, Repeat/extend, Advanced language

**Domains**
- Instructional Support
- Emotional Support
- Classroom Organization

**Indicators**
- Relationships, Affect, Respect, Communication
- Punitive, Sarcasm/disrespect, Negativity
- Aware, Responsive, Address problem, Comfort
- Flexibility, Autonomy, Student expression

**Dimensions**
- Concept development
- Quality of feedback
- Language modeling
Features of teacher-student interaction

- Positive emotional climate
- Productivity
- Quality of feedback
Profiles of classroom quality: First grade

![Bar chart showing emotional and instructional qualities in first grade classrooms.]

- 31% Emotional, 23% Instructional
- 29% Emotional, 17% Instructional
What observational studies reveal

- Exceptional variability, instructionally passive, quality declines over the day
- Little to no association of observed behavior with:
  - Teacher experience, degree, salary, curriculum, public/private
- Small associations (.10):
  - Class size: larger classes more structured; smaller classes more social and more demanding cognitively
  - Family income/education and more positive ratings
- Low-achieving students have 10% rate of stable quality
- A highly dynamic context that can be indexed observationally at more molar levels of analysis – G-studies
Teacher-child interactions and children’s social and academic performance

- Designs that isolate effects for teacher inputs on pre-post after controls
  - Family and demographic factors
  - Children’s prior performance
  - Structural features of schooling
- Primarily small effects (.10-.20)
  - Instructional and emotional support domains predict more positive achievement and social outcomes.
  - Larger effects on more proximal outcomes (e.g., child engagement)
  - Exposures to more instruction in math predicts math gains; literacy intensity predicts phonemic skills
- Stronger effects for different groups of children (approx. .5 s.d./year)
  - Low maternal education
  - Adjustment problems in K
  - Poor
Comparing Process vs Structural Indicators of Quality — Mashburn et al., (in press)

Examined associations between children’s development of academic, language, and social skills during pre-K and:

- Whether pre-K programs met nine standards of quality proposed by the NIEER (Barnett et al., 2004, 2005)
- Observations of the overall quality of the pre-K environment measured by the ECERS –R, and
- Observations of the quality of emotional and instructional interactions measured by the CLASS.
Infrastructure and design quality

- NIEER Index
  - Teacher has BA (70%)
  - Teacher’s field ECE/CD (60%)
  - Teacher Aide has CDA (20%)
  - Class size 20 or less (82%)
  - Comprehensive curriculum (57%)
  - Ratio 10:1 or less (87%)
  - Program serves meals (78%)
  - Program has health services (81%)
  - Program provides family services (47%)
- NIEER Index Average 5.89 (out of 9)
Pre-k quality and growth in child outcomes

- Where should we focus attention in policy, program development, and teacher preparation?
- Predicting achievement growth during pre-k from:
  - Structural features (teacher ed., curriculum, etc.)
  - Observed interactions (ECERS, CLASS)
- No association of structure with outcome, singly or in combination (e.g., NIEER index)
- Instructional and Emotional Supports (CLASS predict positive changes in literacy, language, and math skills)
  - Small effect sizes (.15-.20) persist into kindergarten
# Predicting student development in pre-k

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<th>Emotional Support</th>
<th>Instructional Support</th>
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<tr>
<td>Behavior Problems</td>
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</tbody>
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*Changes in children’s development from beginning to end of preschool*

Mashburn, et al. (in press)
Do associations persist into kindergarten?

- Burchinal 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.

Gains in grade 1 achievement in instructionally supportive classrooms

Standardized tests of achievement adjusted

1st Grade Instructional Support

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

![Bar chart showing standardized tests of achievement adjusted by kindergartem adjustment problems.]

- Low: No problems
- Moderate: No problems
- High: Multiple problems

1st Grade Emotional Support
A focus on literacy and language instruction

- Examine the extent to which variations in the quality of literacy and language interactions, during implementation of activities, was associated with gains in language and literacy skills across pre-k year

- New scale – Literacy Focus – measures extent to which literacy instruction is explicit and embedded within meaningful activities
Findings

- Children in classrooms with higher Literacy Focus scores (in which teachers offered more explicit literacy instruction, embedded in meaningful activities) made greater gains in print awareness and emergent literacy.

- Language modeling was associated with greater gains in vocabulary and emergent literacy for children coming from homes where English was not spoken.
Are there thresholds of quality for poor children?

- Used NCEDL SWEEP and MS data
- Examined only children categorized as poor
- Used spline regression to examine associations between CLASS and outcomes in low-mid- versus high-quality classrooms
Greater gains in social competence only in classrooms scoring over a 5 on ES.

Small declines in problem behavior in low and mid range, larger declines when classroom has at least a 5 on ES.

![Graph showing problem behavior and social competence in relation to Pre-K CLASS Emotional Support scores.](image)
Greater gains observed with higher IS even with scores between 1 to 3 for all outcomes except pre-reading

Significant gains in pre-reading appear to occur only after reaching at least a 3
Implications of thresholds study

- For more positive social outcomes there appear to be strong effects in classrooms scoring over a 5 on Emotional Support (included Behavior Management in this study).

- For more positive academic outcomes (except early reading) there appear to be advantages to even small differences in Instructional Support between a 1 and 3.

- More positive early reading skills may require higher levels of Instructional Support.

- Need to use caution in interpreting these results for policy purposes.
Implications of our work P-12

- Focus regulation and training on teachers’ interactions with children—standards and measures
- Strive toward moving instructional dimensions and implementation “up” the scale of quality interactions
- Develop training and support approaches that address teachers’ interactions with children
- Approach these goals systematically and scientifically with standardized, validated observations at core
- Incentives, supports, and targets for teacher behavior/performance in classrooms
Support for high-quality interactions

Professional development/training

Resource allocation

Evaluation

Curriculum

Observational Assessment

CLASS Instructional Organization Emotional

Social and academic outcomes for children

Improved teacher outcomes