1. Motivation

Many empirical studies have shown that high-quality preschools have positive long-term impacts on student learning. Unfortunately, most young children around the world do not have access to such high-quality care. Our review of the literature on preschool quality suggests that high quality is difficult to achieve in many settings. See Figure 1, which measures quality using the Early Childhood Environment Rating Scale-Revised (ECERS-R), one of many instruments that rely on classroom observation to measure quality.

![Image of early childhood education quality classroom observation](https://example.com/image)

**Figure 1. Observed early childhood education quality classroom observation (ECERS-R) around the world**

<table>
<thead>
<tr>
<th>Country</th>
<th>Average Quality</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>Canada (N=326)</td>
<td>4.7</td>
<td>2.9</td>
</tr>
<tr>
<td>Sweden (N=27)</td>
<td>4.3</td>
<td>3.0</td>
</tr>
<tr>
<td>United Kingdom (N=141)</td>
<td>4.1</td>
<td>2.9</td>
</tr>
<tr>
<td>Beijing, China (N=40)</td>
<td>4.0</td>
<td>2.6</td>
</tr>
<tr>
<td>South Korea (N=24)</td>
<td>3.8</td>
<td>2.2</td>
</tr>
<tr>
<td>Indonesia (N=578)</td>
<td>3.9</td>
<td>2.3</td>
</tr>
<tr>
<td>Bangladesh (N=22)</td>
<td>3.2</td>
<td>1.4</td>
</tr>
<tr>
<td>Brazil (N=138)</td>
<td>2.9</td>
<td>0.7</td>
</tr>
<tr>
<td>Canada (N=24)</td>
<td>2.7</td>
<td>1.2</td>
</tr>
</tbody>
</table>

Notes: N in parentheses is observed number of centers.

We note two limitations in existing studies on early childhood education quality:

- **No correction for measurement error.** The magnitude of the correlation between observed classroom quality in early childhood education and children’s developmental outcomes has been small. These small effect sizes are likely to be underestimates due to measurement error in observations of classroom quality.
- **Misalignment of international standards with local contexts.** Internationally-standardized measures of classroom quality often do not align with local regulations and accreditation standards. This has the potential to introduce noise to measures of classroom quality.

2. Study context: Rural Indonesia

Indonesia has been highly committed to improving both access to and quality of preschools in the country. The Ministry of Education and Culture developed national standards for early childhood education and development (ECED) in 2009 to ensure overall quality in early childhood education programs across the country. The national standards for ECED include requirements for teacher qualifications (degree and teaching competence), and structural characteristics of preschools (size and duration). Although these standards have been in place since 2009, little is known about whether they are adhered to and whether they actually help promote child development outcomes.

3. Research Questions

1. Can we correct for measurement error in observed classroom quality using an instrumental variable approach?
2. Can we better align international standards of early childhood classroom quality with local regulations and standards?
3. Do teacher characteristics predict children’s developmental outcomes?
4. Do structural characteristics of preschool centers—such as student-to-staff ratios and hours of operation—predict children’s developmental outcomes?

4. Data

Data for this analysis was collected in 2013.

- 578 early childhood centers were observed in 303 poor villages in 9 districts
- 7,748 children (ages 4-5) were observed in these early childhood centers

5. Measures

**Variables**
- Early childhood development outcomes
- Classroom observations
- Structural characteristics
- Child characteristics

**Description**
- Early Childhood Development Inventory (EDI), which scored from 1 (low) to 10 (high) on five child development domains: Physical health & well-being, Social competence, Emotional maturity, Language & cognitive development, Communication & general knowledge.

6. Methods

**Observation of classroom quality**

1. **Base model**
   - OLS using ECERS-R: Regress child development outcomes on observed classroom quality. Controls for teacher characteristics, structural characteristics, child characteristics, and district fixed effects.

2. **Correction for measurement error**
   - IV using ECERS-R: Instead of using the average quality of a center, we use the first rater’s score as an instrument for the second rater’s score in a Stage Least Squares (2SLS) model. If differences between the two raters are caused by measurement error, this method will eliminate the downward bias in the estimates between quality and outcomes.

3. **Adjustment for local context**
   - IV using Indonesia standards: Instead of using the ECERS-R scores as our independent variable, using the same IV procedure as above, we examine whether a more locally relevant measure of classroom quality improves estimates.

7. Results

**Table 1.**

<table>
<thead>
<tr>
<th>Observed classroom quality</th>
<th>Physical health &amp; well-being</th>
<th>Social competence</th>
<th>Emotional maturity</th>
<th>Language &amp; cognitive development</th>
<th>Communication &amp; general knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.070*</td>
<td>0.121**</td>
<td>0.088</td>
<td>0.167*</td>
<td>0.133**</td>
<td></td>
</tr>
<tr>
<td>(0.058)</td>
<td>(0.062)</td>
<td>(0.062)</td>
<td>(0.092)</td>
<td>(0.072)</td>
<td></td>
</tr>
</tbody>
</table>

**Notes:** Robust standard errors clustered at the center level in parentheses. Child characteristics and district fixed effects included but not reported. * p<0.1, ** p<0.05, *** p<0.01

In addition to classroom observations of preschool quality, there is considerable policy interest in understanding how teacher characteristics and structural characteristics relate to children’s development since they are usually easier to mandate and less costly to assess than classroom observations. Table 1 reports these associations in our preferred model, while controlling for classroom observations.

**Table 1.**

<table>
<thead>
<tr>
<th>Model</th>
<th>Physical health &amp; well-being</th>
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<tr>
<td>Base model</td>
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<td></td>
</tr>
<tr>
<td>IV using ECERS-R</td>
<td>Correction for measurement error</td>
<td></td>
<td></td>
<td></td>
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<td>IV using ECERS-R</td>
<td>Adjustment for local context</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8. Conclusions

1. Classroom observations of early childhood education quality are subject to considerable measurement error. Correcting for measurement error using an IV approach allows us to improve the use of classroom observations as a predictor of child development outcomes.
2. In countries with a national early childhood education standard, using a subset of the ECERS-R items that correspond with the national standard can provide researchers with an alternative measure of classroom quality that aligns closely to the particular context.
3. There is no consistent pattern between teacher characteristics and child development across the outcomes we consider. For social competence and communication & general knowledge, children attending centers with a higher proportion of teachers with senior secondary or post-secondary education have better outcomes.
4. There is no consistent pattern between structural characteristics and child development across the outcomes we consider. For social competence and language & cognitive development, children attending longer hours of preschool have better outcomes.

9. Limitations and areas for future work

- Data for this study does not allow us to match teachers with students. The measure of teacher characteristics used in this study is averaged at the center-level, which is a less precise measure of teacher quality than could be derived from matched teacher-student datasets.
- It is likely that those with higher levels of education, more experience, and better training provide higher quality care as measured by the items on the ECERS-R, making it difficult to tease apart quality classroom and teacher qualifications.

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The Role of Preschool Quality in Promoting Child Development: Evidence from Rural Indonesia

Sally A. Brinkman1, Amer Hasan2, Hacil Jung3, Angela Kinnell4, Nozomi Nakajima5, Menno Pradhana6


Contact information: Nozomi Nakajima (nakajima@worldbank.org) & Amer Hasan (ahasan@worldbank.org)

1810 H Street NW
Washington, D.C. 20433

References:
