Getting Measurement “Right”

Abbie Raikes
University of Nebraska Medical Center, College of Public Health

Impact Evaluation and Measurement of ECE in MENA
April 15-19, Abu Dhabi
Overview of Presentation

1. Key constructs to capture in early childhood measurement: What’s most important to describe?

2. Clarifying purpose for measurement: What type of data will be most useful?

3. Mechanics of measurement: How can we select measures and ensure their cultural relevance?
Basic Ideas of Developmental Science

• Child development arises through biologically-driven behaviors and environmental influence (and culture)

• Neurological development is stimulated by environmental inputs

• Child development is holistic and reflects multiple influences

• Most of the research still comes from a few countries
Constructs to Include

• Early childhood development is holistic – so how do we decide what to include in measurement?
  • Which constructs are more central to the purpose of measurement?
  • Which may lead to misleading results if NOT measured?
  • Which of the many constructs are more readily measured than others?
Range of Factors to Consider ...

<table>
<thead>
<tr>
<th>ENABLING ENVIRONMENT FOR CAREGIVER &amp; FAMILY</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Adequate nutrition during pregnancy</td>
</tr>
<tr>
<td>• Antenatal care</td>
</tr>
<tr>
<td>• Safe delivery</td>
</tr>
<tr>
<td>• Maternal mental health</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SOCIAL, ECONOMIC, POLITICAL CONTEXT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Good governance</td>
</tr>
<tr>
<td>• Employment</td>
</tr>
<tr>
<td>• Security</td>
</tr>
<tr>
<td>• Housing</td>
</tr>
<tr>
<td>• Political commitment (e.g., parental leave, support for childcare, child protection, social safety nets)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EDUCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Access to daycare</td>
</tr>
<tr>
<td>• Preschool education</td>
</tr>
<tr>
<td>• Primary school readiness</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>HEALTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Immunizations</td>
</tr>
<tr>
<td>• Water and sanitation</td>
</tr>
<tr>
<td>• Disease prevention</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPTIMAL NUTRITION &amp; RESPONSIVE CAREGIVING</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Stimulating environment</td>
</tr>
<tr>
<td>• Parenting support</td>
</tr>
<tr>
<td>• Home visits</td>
</tr>
<tr>
<td>• Books, toys, materials</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OPTIMAL CHILD DEVELOPMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Improved cognitive, motor and social-emotional development</td>
</tr>
<tr>
<td>• Improved school performance and learning</td>
</tr>
<tr>
<td>• Improved work capacity and productivity</td>
</tr>
</tbody>
</table>

NUTRITION
- Breastfeeding
- Micronutrient supplementation
- Dietary diversity
- Supplementary food

Source: Adapted from Black et al. 2017.
Expect Complex Results

• Human beings are highly responsive to environments

• Caregiving and home environments will always be a powerful influence on child development ...
  
  • But effects of interventions may vary based on characteristics of families and children

• Ensure that samples are big enough and enough measures are used to capture range of results
Health and Nutrition Status

• Undernutrition: Critical to measure if the long-term outcome is learning
  
  • Some evidence that children differentially respond to interventions based on early nutrition status

• Health and Nutrition status not always measured in Education sector interventions, but has a profound impact on children’s learning
A Few Things May Matter A lot …

• Interactions with others are an engine of development
  • Children learn from caregivers, peers

• Caregiving may be culturally or contextually influenced
  • Can be many caregivers and caregiving can come in many forms

• But relevant everywhere: Some degree of stimulation and engagement is necessary
Family Assets

• Family socio-economic status is a very powerful predictor of child learning

• Some programs may mitigate this gap, but unlikely to see it closed entirely by an intervention program

• Why? Combination of generational nutrition, education, access to care
Caregiver/Child Interactions

- https://www.youtube.com/watch?v=JPejofp9BnQ
Home Environments

• Always a powerful influence on child development

  • Includes a range of factors: Strong associations with caregiver education levels; overall family assets

• Needs to be defined based on cultural norms, but also reflecting developmental science

  • If children are expected to learn to read in early primary school, exposure to print and engagement in discussion really helps
harvest... Kid's Right. Whose farmer's harvesting? Whose is harvesting at house? IN THE FIELD.
Early Learning Environments

• Interactions between teachers and children are critical for learning

• Most research on elements of high-quality learning environments comes from a few countries
  
  • More work needed to untangle definitions of quality in cultural and country context

• But basic theories of child development can provide a guide
Cross-country predictors of learning

• Children’s abilities to choose, small group activities (vs. whole group)

• Why is “choice” in activities important?
  • Young children’s learning supported through intentional exploration

• Support for learning
  • Asking children to think through their reasoning through dialogue
  • Exploration of materials
Examples of Cultural Differences

• Values for Children
  • Social responsibility: Key construct of how well children care for others

• Values among Caregivers
  • Caretaking distributed among several caregivers
  • Prioritization of child’s contribution to rest of community
Moving from Constructs to Data

Selecting and Adapting Tools
How to Approach Measurement

• Good measurement begins with a clear theory of change
  
  • What do you think the “problem” is, and how can you change it? Measure the problem and the potential solution

• Know how you will use the data when you start
  
  • “Write” the final report and imagine the final discussion: What policy or program questions do you want to inform? What complex results will you likely find, and how will you explain them?

• Measures are inevitably limited representations of the complex worlds of young children and their families
  
  • Use contextual knowledge and intuition to interpret fully – and listen to your instincts
Step 1: What type of data do we need?

**FIGURE 1.1 Three Primary Reasons for Assessing Child Outcomes**

1. **GLOBAL OR NATIONAL POPULATION MONITORING**
   - **Goal:** Detecting broad trends in child development to inform policy
   - **Application:** May be intended to be comparable across populations; may not be sufficiently detailed to be sensitive to interventions
   - **Requirements:** Alignment with content of national standards for preschool and primary education to ensure policy relevance

2. **PROGRAM EVALUATION**
   - **Goal:** Demonstrating impacts of specific programs or policies
   - **Application:** Must be sufficiently detailed to quantify impact on child development
   - **Requirements:** Alignment with program or policy goals to detect possible range of impacts; alignment with cultural and national standards to detect program effects relevant to local policy

3. **HYPOTHESIS-DRIVEN OR EXPLORATORY RESEARCH**
   - **Goal:** Exploring a range of impacts on child development in line with theory and existing understanding of neural mechanisms
   - **Application:** May be sensitive to wider range of effects, both predicted and not specifically predicted, enabling new discovery; may use new technologies to advance the field
   - **Requirements:** Alignment of the method to the local culture and context to ensure valid results
Measures Vary Based on Purpose

• Population-based measurement is typically less specific but is feasible to collect with representative samples

• Measures for program evaluation should be aligned with what changes you want to see as a result of the program

• Measures for exploratory research “throw the net wider” and collect broader and deeper information so a full range of hypotheses can be tested
FIGURE 9.1 Flowchart for Identifying a Suitable Assessment Tool

**STEP 1: DEFINE PURPOSE OF ASSESSMENT**
1. Population/global or national monitoring
2. Program evaluation
3. Hypothesis-driven or exploratory research
4. Screening of a child for referral

**STEP 2: DETERMINE PHYSIOLOGY OR BEHAVIOR**
- **PHYSIOLOGY** Identifies biological mechanisms of effects on behavior to inform more effective intervention
- **BEHAVIOR** More clearly links to child function in everyday life

**STEP 3: DETERMINE MODE OF ASSESSMENT**
- Autonomic nervous system
- Brain structure
- Brain function
- Direct child assessment
- Parent/teacher report
- Naturalistic or structured observation

**STEP 4: DETERMINE TYPE OF ASSESSMENT**
- **SCREENING** Binary score indicating risk of delay
- **ABILITY** Continuous score indicating child's skill level

**STEP 5: DETERMINE WHICH ASSESSMENT TO USE (EXAMPLES BELOW)**
- Heart rate, respiratory rate, stress (e.g., cortisol, galvanic skin response)
- Structural MRI, RNIS, ERP
- RINDA, GACD
- MBM, KID, BSD, NSPD, WISC, KABC
- ASQ, PPDS, TQ
- DACE, MacArthur Bates CDSM
- RIAS: Child Coding System
### Selecting Domains to Measure

<table>
<thead>
<tr>
<th>DOMAIN</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>COGNITIVE SKILLS</td>
<td>The processes or faculties by which knowledge is acquired and manipulated, including abilities such as memory, problem solving, and analytical skills</td>
</tr>
<tr>
<td>LANGUAGE SKILLS</td>
<td>The ability to understand and express verbal communication</td>
</tr>
<tr>
<td>MOTOR SKILLS</td>
<td>The ability to control and coordinate gross movements of the legs and arms (e.g., jumping, throwing) and fine movements of the fingers</td>
</tr>
<tr>
<td>EXECUTIVE FUNCTION/SELF-REGULATION/EFFORTFUL CONTROL</td>
<td>Intentional control over behavior and cognition. Executive function includes abilities such as inhibitory control, cognitive flexibility, attention, and working memory</td>
</tr>
<tr>
<td>TEMPERAMENT</td>
<td>Biological influences on the experience and expression of emotion, including extraversion/surgency (positive affect, activity level, impulsivity, risk-taking), negative affectivity (fear, anger, sadness, discomfort), and effortful control (attention shifting and focusing, perceptual sensitivity, inhibitory and activational control)</td>
</tr>
<tr>
<td>SOCIAL-EMOTIONAL SKILLS</td>
<td>The regulation of emotional responses and social interactions, which is a function of both temperament and self-regulation, including behavior problems, social competency, and emotional competency</td>
</tr>
<tr>
<td>PERSONAL-SOCIAL/ADAPTIVE SKILLS</td>
<td>The ability to perform daily-life skills, such as self-feeding, dressing, toilet training, interacting with others, and adjusting to new situations</td>
</tr>
<tr>
<td>PRE- AND EARLY-ACADEMIC SKILLS</td>
<td>Skills needed to learn reading and math, such as counting and letters</td>
</tr>
<tr>
<td>APPROACHES TO LEARNING</td>
<td>Behaviors related to how children become engaged in learning experiences, such as the ability to stay focused, interested, and engaged in activities</td>
</tr>
</tbody>
</table>
Getting Reliable Data

• Close alignment with underlying construct of interest

• Culturally appropriate

• Feasible to train observers

• Based on clear purpose and ideally, theory of change

• Broad enough range of constructs to adequately capture influences on child development
Quality Measure Training
Prof. Carolina Maldonado, Paola Guerrero Rosada and team, Universidad de los Andes

- Workshop sessions
- Practice sessions
  - Review instruments
  - Ethic standards
  - Video coding
  - Live coding

Inter-rater reliability

50 participants → 26 observers
[others do surveys]
Armenia 77%
Manizales 75%
Pereira 75%
Data Quality Influenced by All Steps

**Figure 4.1 The Importance of Validity and Quality in Data Collection**

- **Purposes of Assessment**
- **Underlying Construct/Ability**
- **Method**
- **Implementation**

Conclusions depend on how well the score reflects the underlying construct/ability.

**Data:** Item Score, Subscale Scores, Composite Scores, Risk/Delay
Adaptation Process

- **Preparation**
  - Convene local experts to review measures
  - Conduct focus groups and interviews

- **Translate**
  - Item and functional equivalence

- **Review for Appropriateness**
  - Check in with the experts
  - Review materials, items, language

- **Pilot test**

- **Document changes**
Conclusions

• Child Development is Holistic
  • Measuring more may help explain why an intervention shows effects or not

• Development emerges from biologically-driven behaviors and environmental (including cultural) influence

• Measurement must be aligned to purpose, cultural context to produce good results

• Use the World Bank Toolkit to guide your work: Many choices

*Plan well: Rely on developmental science, make sure purpose is clear and there is time and resource to adapt to local context*
**Initiated in 2014**
by UNESCO, UNICEF, Brookings Institution and World Bank
[MELQO background reports: ecdmeasure.org](http://ecdmeasure.org)

**Purpose**
To develop a set of tools to measure early childhood development and quality of learning environments in low-and middle-income countries

**SDG 4.2**
By 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education [SDG Goals](http://sdgs.un.org/ouragenda)
Create two sets of tools – one on **child development and learning outcomes** and one on **quality of settings**– that are conceptually linked.

**Build on existing tools, to create a common set of items** that could be integrated into existing measures and help inform global monitoring, while promoting national-level measurement.

**Develop tools and processes for using them that are feasible, actionable and adaptable** for use at the national level – **LOCAL ADAPTATION IS CRITICAL**.
# Making Measurement Easier — Options

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td><strong>One Measure Used Everywhere:</strong> Same items, same administration everywhere, with a small amount of adaptation</td>
<td></td>
</tr>
<tr>
<td><strong>2</strong></td>
<td><strong>Common Core of Items:</strong> One small set of items, may be part of larger and more culturally-adapted set</td>
<td></td>
</tr>
<tr>
<td><strong>3</strong></td>
<td><strong>Common Constructs, with Items that May Vary:</strong> May be able to “match” at level of construct, but with different items</td>
<td></td>
</tr>
<tr>
<td><strong>4</strong></td>
<td><strong>Item Bank:</strong> Lots of items, with little or no commonality from one place to the next</td>
<td></td>
</tr>
</tbody>
</table>
Decision...

For child development and learning, common set with room for national adaptation (Option 2)

For quality, “compare” at the construct level (Option 3)
MODEL INSTRUMENTS

How is information gathered?

MODEL MODULE

Teacher/Caregiver Survey

Teacher Interview

Parent Interview

Direct Learner Assessment

Oral-based Assessment
MELE INSTRUMENTS

How is information gathered?

MELE MODULE

Director/Teacher/ Caregiver Survey

Classroom Observation

ORAL INTERVIEWS

1. Head Teacher/ Supervisor Interview
2. Teacher Interview
3. Parent Interview

OBSERVATION
<table>
<thead>
<tr>
<th>Construct</th>
<th>Definition</th>
<th>Sample Items</th>
</tr>
</thead>
</table>
| Play           | Emphasis of the programme on creating opportunities for all children to explore and engage in free play and group play, the presence of adequate toys and spaces to play. | *Do all children have time for play during the school day?*
*Do all children get an opportunity to use toys during play?*
*Do all children have access to sufficient, varied and challenging materials, such as blocks, books and coloured pencils?*
| Pedagogy       | Approaches that teachers take in teaching children, including individualized and/or group lessons and opportunities for dialogue, and in supporting a successful transition to primary school independent work. | *Has an age-appropriate curriculum or set of guidelines been developed outlining competencies and lesson plans?*
*Do children use objects to learn mathematics, for example, do teachers encourage children to use objects for numerical exploration like sorting, counting and operations?*
*Do teachers introduce new vocabulary by reading storybooks to children daily?*
*Are children learning to perform new skills independently?*
| Interactions   | Type and quality of interactions between teachers and children, and between children and their peers. | *Do teachers discipline and maintain order without being excessively negative?*
*How often do teachers smile or verbally praise children?*
*Do teachers patiently coach children who struggle to learn a new concept?*
*Do teachers encourage children’s questions and respond to them with sentences of explanation?*
| Environment    | Physical space and safety of the classroom, including access to clean water and toilets, and adequate space for each child. | *Is there clean drinking water available for the children? Are toilets available for both boys and girls?*
*Are there safety hazards?*
*Is indoor and outdoor space sufficient for play?*
*Is there enough space for all children to sit and room for play?*
| Personnel      | Experiences of teachers and directors in training, years of service, compensation, supervision and mentoring. | *How many years have you been a teacher overall?*
*Do you receive support from your supervisor, through in-class observations and professional development?*
*During the last 12 months, how often have you been observed in your classroom teaching as a part of supervision, monitoring or training?*
*How useful was the feedback you received from supervisors and from peers?*
| Parent & Community Engagement | Extent to which parents and community members are encouraged and able to engage in children’s education. | *Do parents have regular meetings with teachers to discuss children’s learning and development?*
*Do community members who are not parents (in the neighbourhood or village) participate in making decisions about the programme?*
*How often does your pre-primary programme provide group sessions on parenting or home visits?*
| Inclusiveness  | Extent to which the classroom is able to support participation for all children, which may include gender, learning needs, and cultural, ethnic and linguistic accommodations. | *Does the programme show evidence of encouraging enrolment and participation of all ethnic, linguistic, religious and gender groups?*
*Are children with disabilities included in the programme?*
*Does the programme include a focus on mother tongue instruction?*
Important Differentiation in Quality

• Structural Quality Emphasized [more easily monitored and regulated]:
  • Basic health, safety, child group size, adult-child ratio, nutrition

• Process Quality Overlooked [requires reliable and valid observations of classrooms]:
  • Quality of teacher-child interactions; specific areas of play-based instruction; support of language, socio-emotional development, early numeracy, creativity, cooperation
Play-based teaching/ Child-directed learning

• Teachers enhance learning by encouraging
  • Children to use materials in a playful way
  • Children to add their own ideas to an activity; children have some choice
  • Discussion and conversation that can extend ideas, concepts, help children master a skill or advance to a higher level
  • Relating concept to child’s experiences
Key Concepts: related components

Developmentally appropriate materials, activities and lessons are not too easy nor too hard
• Books with pictures and some text
• Blocks for building
• Small objects for sorting by shape, color
• Thick pencils, chalk for writing
• Puzzles (3-10 pieces)

Scaffolding
• Teachers provide support and structure to help children master a new skill or new level; build on what children know
A Few Years Later ... Where Are We?

- Adaptation to local standards and practices is critical – especially for MELE

- Partnering with local research partners helps create long-term capacity and buy-in

- It’s a lot of work and results can be tricky to interpret

- In some countries, MELQO offers the first national-level data on quality of PPE and child development
A Few Years Later ... Where Are We?

• Child development measures (MODEL teacher report and direct assessment) typically shows validity within (but not across) countries

• Quality measures (MELE classroom observation, teacher and director survey) are less clearly valid
  • Uneven associations with teacher characteristics and child outcomes – several versions, mixed results
It’s What Teachers Do, Not What Schools Have

• How teachers teach is related to child learning in both Africa and Latin America. Effective teaching supports learning through:
  • Dialogue, conversation;
  • Giving feedback to children;
  • Drawing on children’s experiences while teaching;
  • Child engagement with materials

• Structural items – often related to standards in many countries – have NOT been as reliably related to learning
Open-ended questions allow children to...

- Engage in conversation about that topic
- Reflect on new information
- Answer with more than 1-2 word response
- Use varied language and vocabulary in response
- Consider a range of possible answers

Conversation “builders” – they help to start or continue conversations.
Expressive Language: EXAMPLE

**Teacher**: I see you are making a picture. Tell me about your picture.
**Child**: I’m drawing my house.
**Teacher**: I see. Tell me about your house.
**Child**: It is green and yellow and my grandmother lives with us.
**Teacher**: Oh! What do you like to do with your grandmother?
Teaching consonant-vowel combinations for “g”
Teaching letters and letter sounds to whole group
Learning about nutrition foods through conversation and materials
Movement & Music: Learning Body Parts through song
Globally Relevant or Locally Defined?

- Storybooks: Essential for later reading
- Supportive, positive teacher-child interactions “pedagogy”
- Opportunities for child engagement and participation

What “positive emotion” looks like
- Teachers’ use of classroom groupings
- Safety standards
Several Measures

• ECERS – Environmental Rating Scale

• CLASS – Classroom Assessment Scoring System
  • TIPPS is a version for low- and middle-income countries

• Locally-developed tools
TIPPS Measure: Seidman, Kim, & Raza, 2016

Developed based exploratory and confirmatory factor analysis, we assess impacts on three dimensions of classroom quality.

- **Facilitating deeper learning**
  - Scaffolding (concept development)
  - Quality of feedback
  - Objectives explicit

- **Emotional support & behavior management**
  - Positive climate
  - Negative climate
  - Teacher sensitivity/tone
  - Behavior management
  - Consistent Routine

- **Supporting student expression**
  - Student ideas considered
  - Reasoning/problem solve
  - Connections to life
  - Language modeling

Developed based exploratory and confirmatory factor analysis, we assess impacts on three dimensions of classroom quality.
Experimental Impacts of the ‘Quality Preschool for Ghana’ Intervention: Implications for System-level Reform

Sharon Wolf, J. Lawrence Aber & Jere Behrman
ECE participation is on the rise globally, and Ghana is a leader in these trends

2004: National Early Childhood Care and Development Policy; KG curriculum developed.

2007: Expansion of 2 years of pre-primary education (KG1 and KG2) as part of free, compulsory and basic education (fCUBE).

SSA Region: 20%
Ghana: 80.5%
The policy context in Ghana

• The 2012 GES report that the 2004 KG curriculum is sound, but that teacher behavior has not adapted to reflect new pedagogy.

• Top priority: Train 27,000 untrained teachers in KG-specific pedagogy.

• Another priority: engaging parents in schools and raising their awareness of KG-specific pedagogy.

• Private schools must comply with the national curriculum and standards.
Quality Preschool for Ghana (QP4G)

• In partnership with Ghana Education Service, National Nursery Teacher Training Center, University of Pennsylvania, NYU and Innovations for Poverty Action:

• Develop and test a *nationally scalable* model for teachers and parents with the goal of improving KG quality and children’s school readiness.
The In-Service Teacher Training Program

• 5 days in September, followed by refresher trainings in January (2 days) and May (1 day) implemented by NNTTC trainers.
• Classroom visits paired with monitoring / feedback from district coordinators.

5 areas:
(1) How children learn—developing a child-friendly environment
(2) Classroom management
(3) Integrating play into language and literacy instruction
(4) Integrating play into early numeracy instruction
(5) Assessment and planning
Implementation: Are teachers integrating practices from the training in their classroom?

Checklist with 15 teaching practices that were in the training. For example:

- **Teacher praises children for positive behavior**
- **Teacher threatens children with or uses a cane on children at least once**
- **Teacher explicitly reminds children of the class rules**
- **Teacher asks students at least two open-ended questions during the class**
- **Teacher uses one or multiple songs to facilitate learning**
- **The lesson consists of a game that facilitated the lesson objectives**
- **Teacher incorporates found items as Learning Materials (e.g., bottle caps, milk cartons)**
Teachers integrate training practices in their classrooms

Teachers were videotaped teaching for 30-45 minutes.

On average, teachers in both treatment conditions implemented **1.5 additional** “developmentally appropriate” activities during the observed period of teaching practice.

$ES = 0.54 \ (TT), \ 0.60 \ (TTPA)$
Classroom process quality: Does QP4G improve the quality of teacher-child interactions? [TIPPS measure; Seidman, Kim, & Raza, 2016]

Developed based exploratory and confirmatory factor analysis, we assess impacts on three dimensions of classroom quality.

Facilitating deeper learning
- Scaffolding (concept development)
- Quality of feedback
- Objectives explicit

Emotional support & behavior management
- Positive climate
- Negative climate
- Teacher sensitivity/tone
- Behavior management
- Consistent Routine

Supporting student expression
- Student ideas considered
- Reasoning/problem solve
- Connections to life
- Language modeling
QP4G improves the quality of some teacher-child interactions
Teacher professional well-being: Does QP4G improve teacher well-being?

Developed based on both new and previously validated survey measures, and analyzed using factor analysis:

**Construct Measures**

**Motivation**
(5 items, α = .64)
Adapted from Bennell & Akyeampong (2007)
- I’m highly motivated to:
  - ...help children learn to read and write
  - ...help children develop well socially.

**Burnout**
(11 items, α = .85)
Maschlach Burnout Inventory (Maschlach et al., 1996)
- How often have felt mentally drained from your work.
- How often do you feel fatigued when you wake up in the morning.

**Job dissatisfaction**
(4 items, α = .72)
Adapted from Bennell & Akyeampong (2007)
- I want to transfer to another school
- I want to leave the teaching profession

Effect Size (dwt)

<table>
<thead>
<tr>
<th>Construct</th>
<th>TT</th>
<th>TTPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation</td>
<td>0.35</td>
<td>0.12</td>
</tr>
<tr>
<td>Burnout</td>
<td>0.22</td>
<td>-0.13</td>
</tr>
<tr>
<td>Job Satisfaction</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Teacher attrition: Does QP4G reduce the likelihood that teachers’ leave the school mid-year?

**YES**

Notably, this occurred entirely in the private sector.

The probability of a teacher leaving the school in the private sector was reduced by **82%**.
QP4G improves children’s school readiness, primarily social-emotional development
One year later: Teachers are still using some of the training practices, but other impacts have faded out or become negative.
One year later: Impacts on social-emotional outcomes sustained

![Chart showing impacts on various outcomes](chart.png)
Conclusions

• Structural and Process Quality in Early Childhood Education are both important in predicting child development and learning.

• However, structural quality is more easily regulated and therefore many systems do not link process quality measures to quality improvement policies and programs.

• Observational measures of process quality can be used in conjunction with professional development and coaching mentoring of ECE teachers.

• Observational measures of process quality are sensitive to the impacts of teacher professional development interventions and help explain the effects of programs on child development and learning.