

Getting Measurement “Right”

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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 ...

FIGURE 2.1 The Role of Context, Environment, and Caregiving in Child Development

ENABLING ENVIRONMENT FOR CAREGIVER & FAMILY

- Adequate nutrition during pregnancy
- Antenatal care
- Safe delivery
- Maternal mental health

SOCIAL, ECONOMIC, POLITICAL CONTEXT

- Good governance
- Employment
- Security
- Housing
- Political commitment (e.g., parental leave, support for childcare, child protection, social safety nets)

EDUCATION

- Access to daycare
- Preschool education
- Primary school readiness

HEALTH

- Immunizations
- Water and sanitation
- Disease prevention

CAREGIVING

- Stimulating environment
- Parenting support
- Home visits
- Books, toys, materials

NUTRITION

- Breastfeeding
- Micronutrient supplementation
- Dietary diversity
- Supplementary food

OPTIMAL NUTRITION & RESPONSIVE CAREGIVING

OPTIMAL CHILD DEVELOPMENT

- Improved cognitive, motor and social-emotional development
- Improved school performance and learning
- Improved work capacity and productivity



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

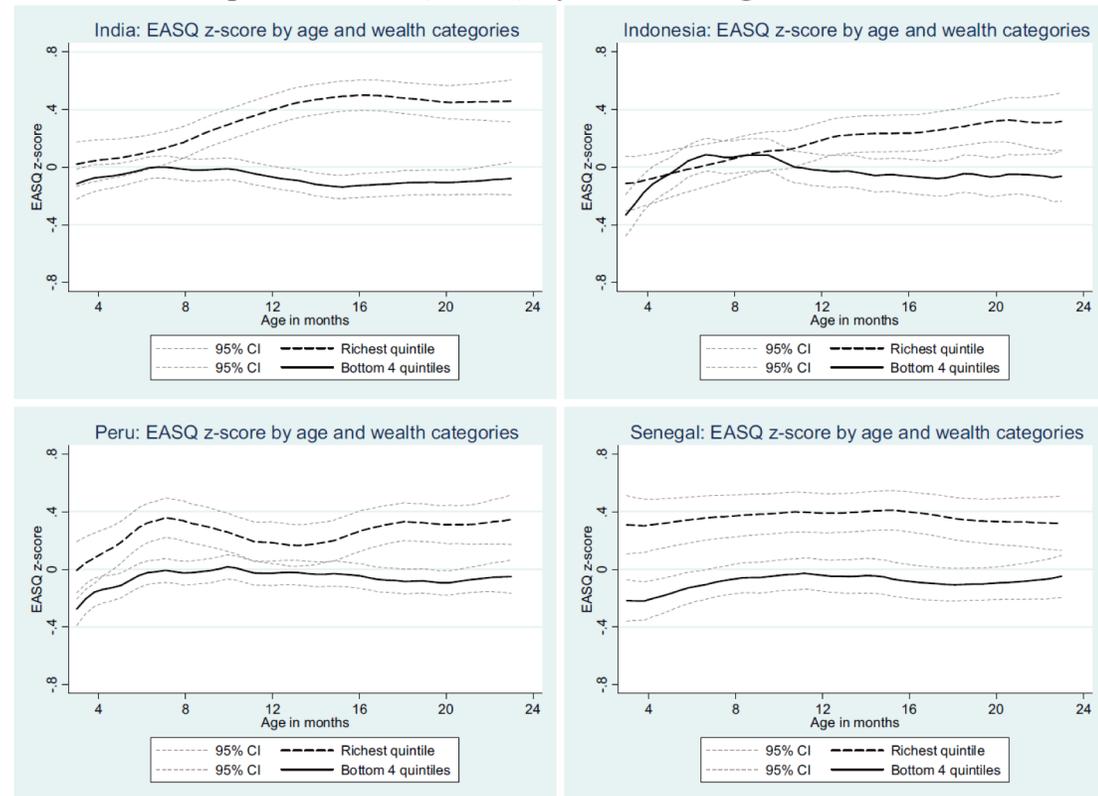
A Few Things May Matter A lot ...

- 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

Child development scores (EASQ) by wealth categories



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... kiki is right, What farmer's harvesting? **VEGETABLES**
the man is harvesting. Where is he harvesting in? house or... **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







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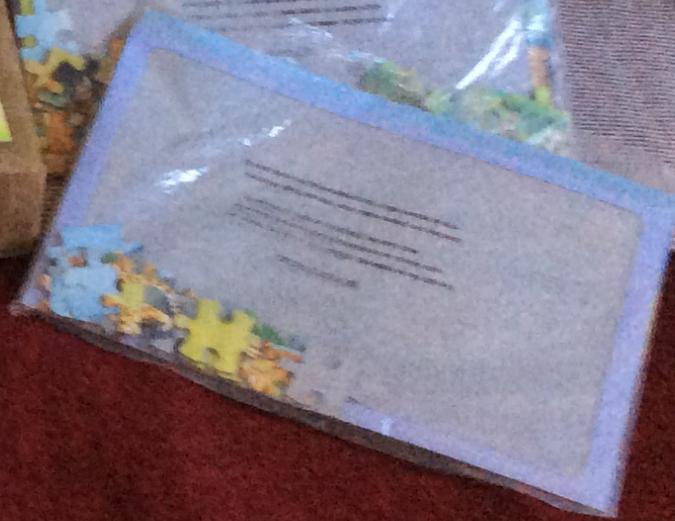
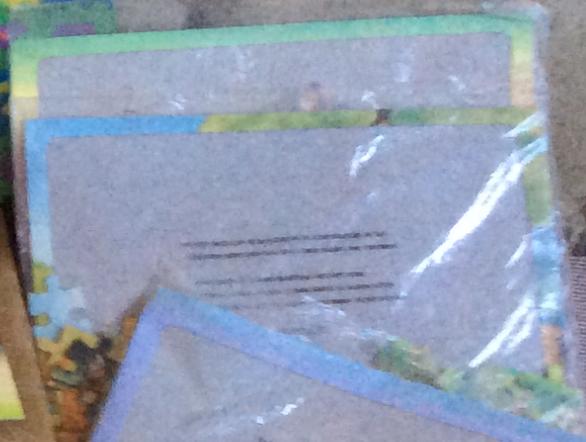
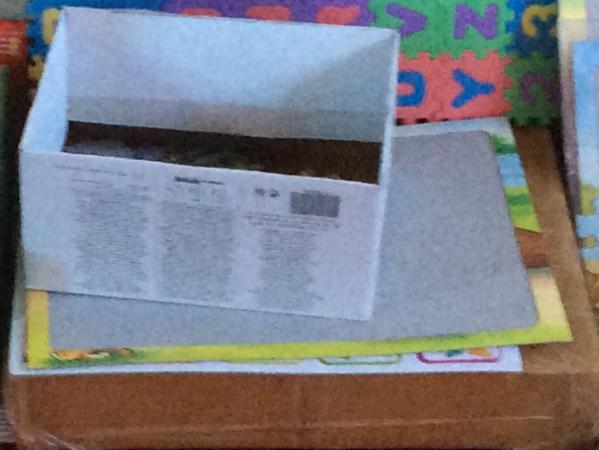
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own boss!
With our award winning
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Examples of Cultural Differences

- 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

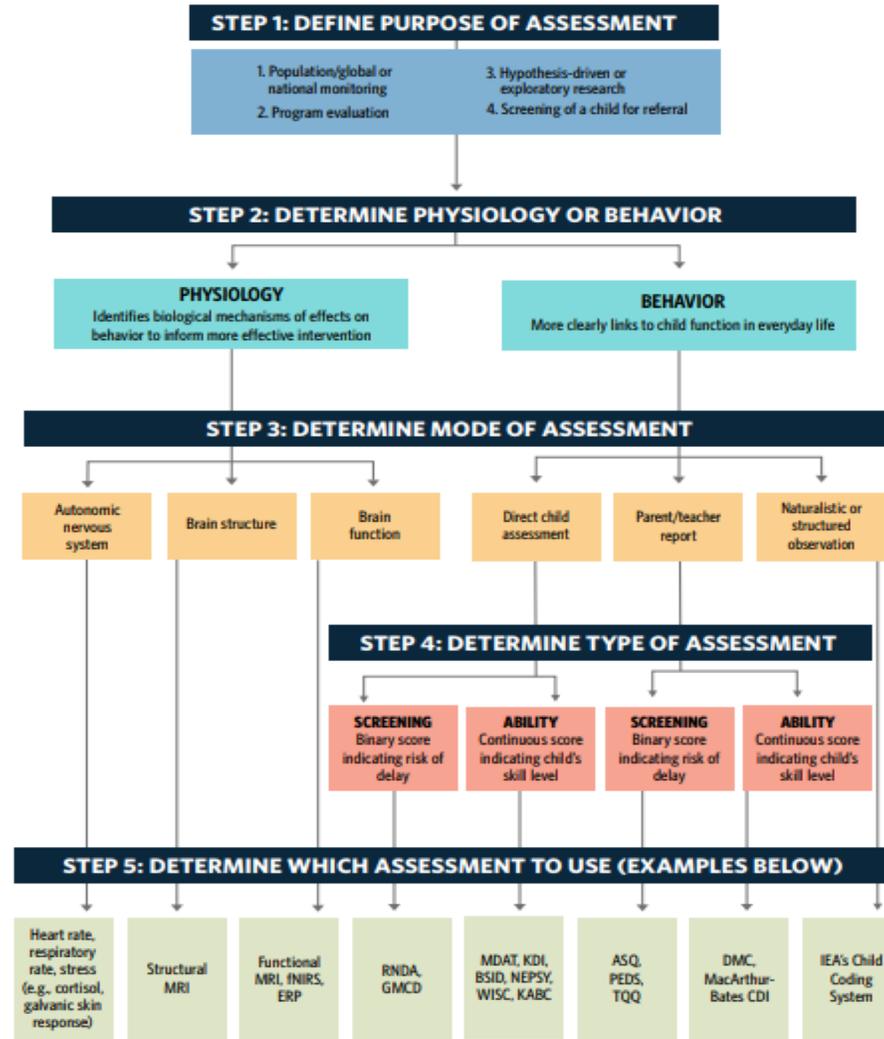
Application: May be sensitive to wider range of effects, both predicted and not specifically predicted, enabling new discovery; may use new technologies to advance the field

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



Selecting Domains to Measure

TABLE 3.1 Description of ECD Domains

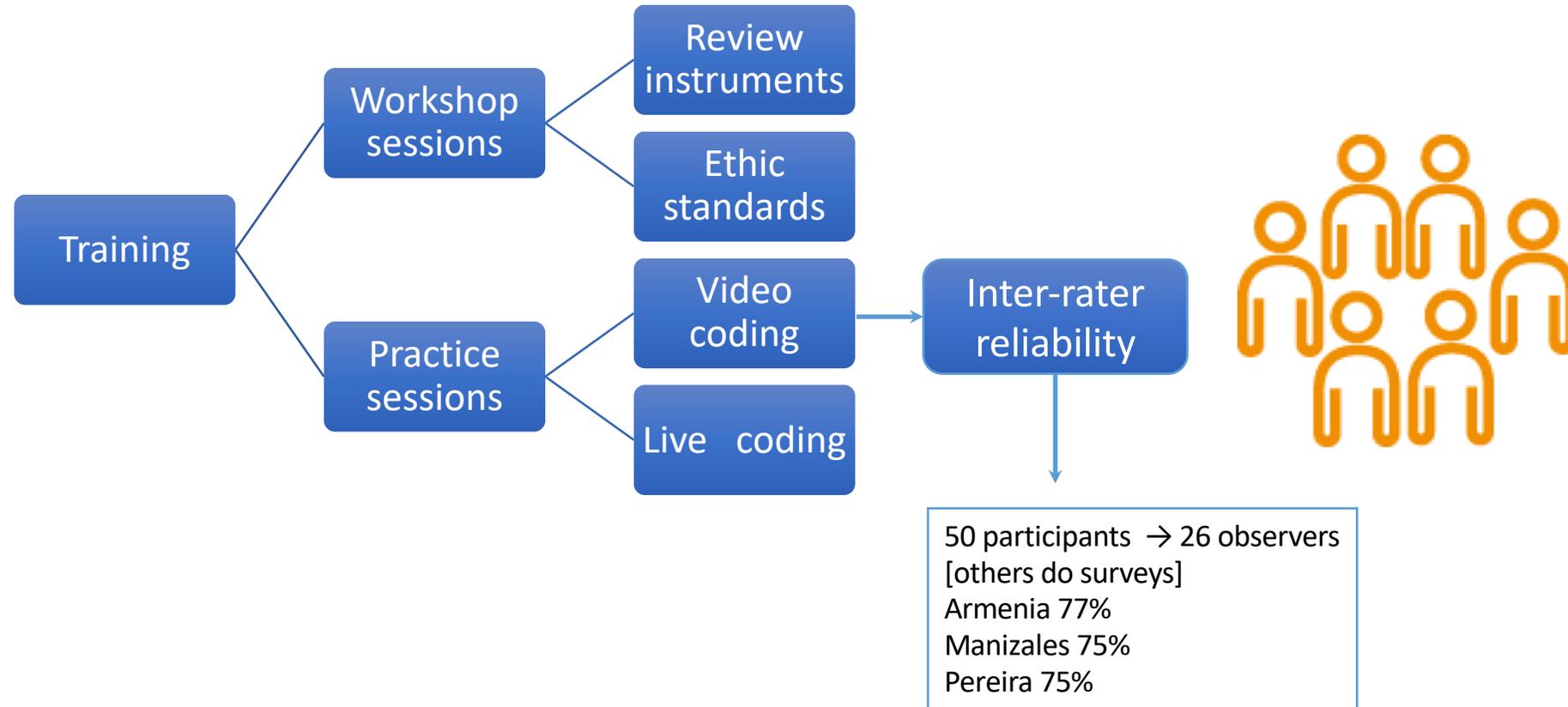
DOMAIN	DESCRIPTION
COGNITIVE SKILLS	The processes or faculties by which knowledge is acquired and manipulated, including abilities such as memory, problem solving, and analytical skills
LANGUAGE SKILLS	The ability to understand and express verbal communication
MOTOR SKILLS	The ability to control and coordinate gross movements of the legs and arms (e.g., jumping, throwing) and fine movements of the fingers
EXECUTIVE FUNCTION/SELF-REGULATION/EFFORTFUL CONTROL	Intentional control over behavior and cognition. Executive function includes abilities such as inhibitory control, cognitive flexibility, attention, and working memory
TEMPERAMENT	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)
SOCIAL-EMOTIONAL SKILLS	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
PERSONAL-SOCIAL/ADAPTIVE SKILLS	The ability to perform daily-life skills, such as self-feeding, dressing, toilet training, interacting with others, and adjusting to new situations
PRE- AND EARLY-ACADEMIC SKILLS	Skills needed to learn reading and math, such as counting and letters
APPROACHES TO LEARNING	Behaviors related to how children become engaged in learning experiences, such as the ability to stay focused, interested, and engaged in activities

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

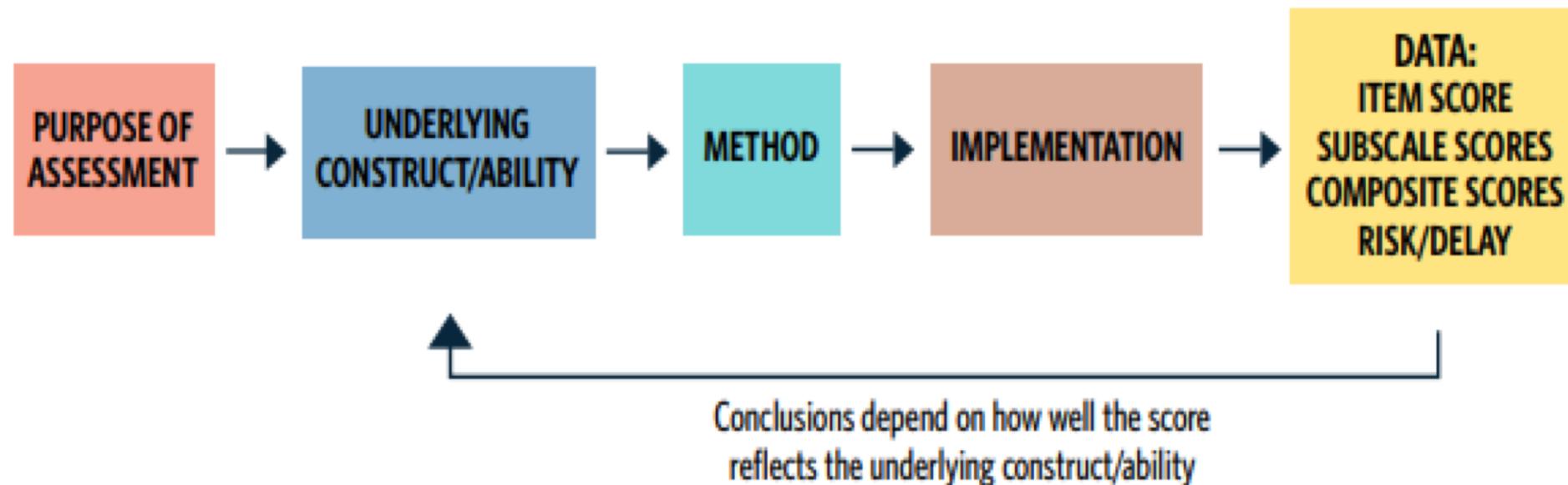
Quality Measure Training

Prof. Carolina Maldonado, Paola Guerrero Rosada and team, Universidad de los Andes



Data Quality Influenced by All Steps

FIGURE 4.1 The Importance of Validity and Quality in Data Collection



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



Measuring Early Learning Quality & Outcomes (MELQO)

Initiated in 2014

by UNESCO, UNICEF, Brookings Institution and World Bank
[[MELQO background reports](http://ecdmeasure.org): 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](https://www.un.org/sustainabledevelopment/education/)]



MELQO Goals

1

Create two sets of tools – one on **child development and learning outcomes** and one on **quality of settings**– that are conceptually linked

2

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

3

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

1

One Measure Used Everywhere: Same items, same administration everywhere, with a small amount of adaptation

3

Common Constructs, with Items that May Vary: May be able to “match” at level of construct, but with different items

2

Common Core of Items: One small set of items, may be part of larger and more culturally-adapted set

4

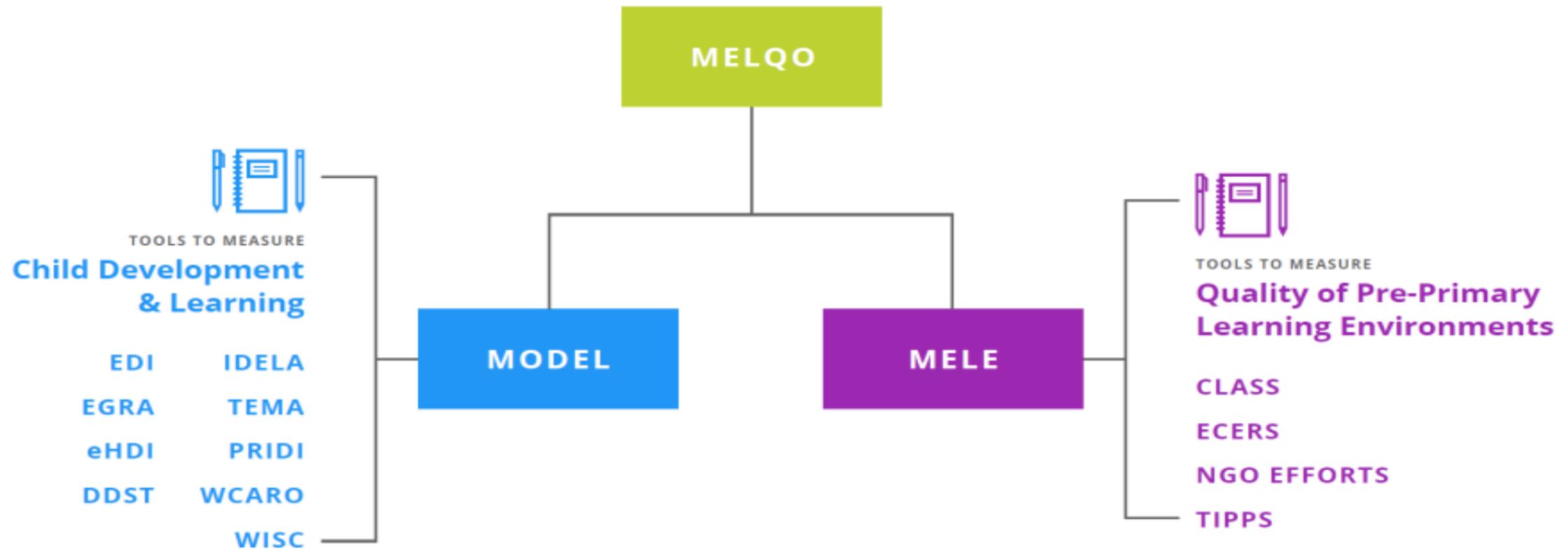
Item Bank: Lots of items, with little or no commonality from one place to the next

Decision...

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

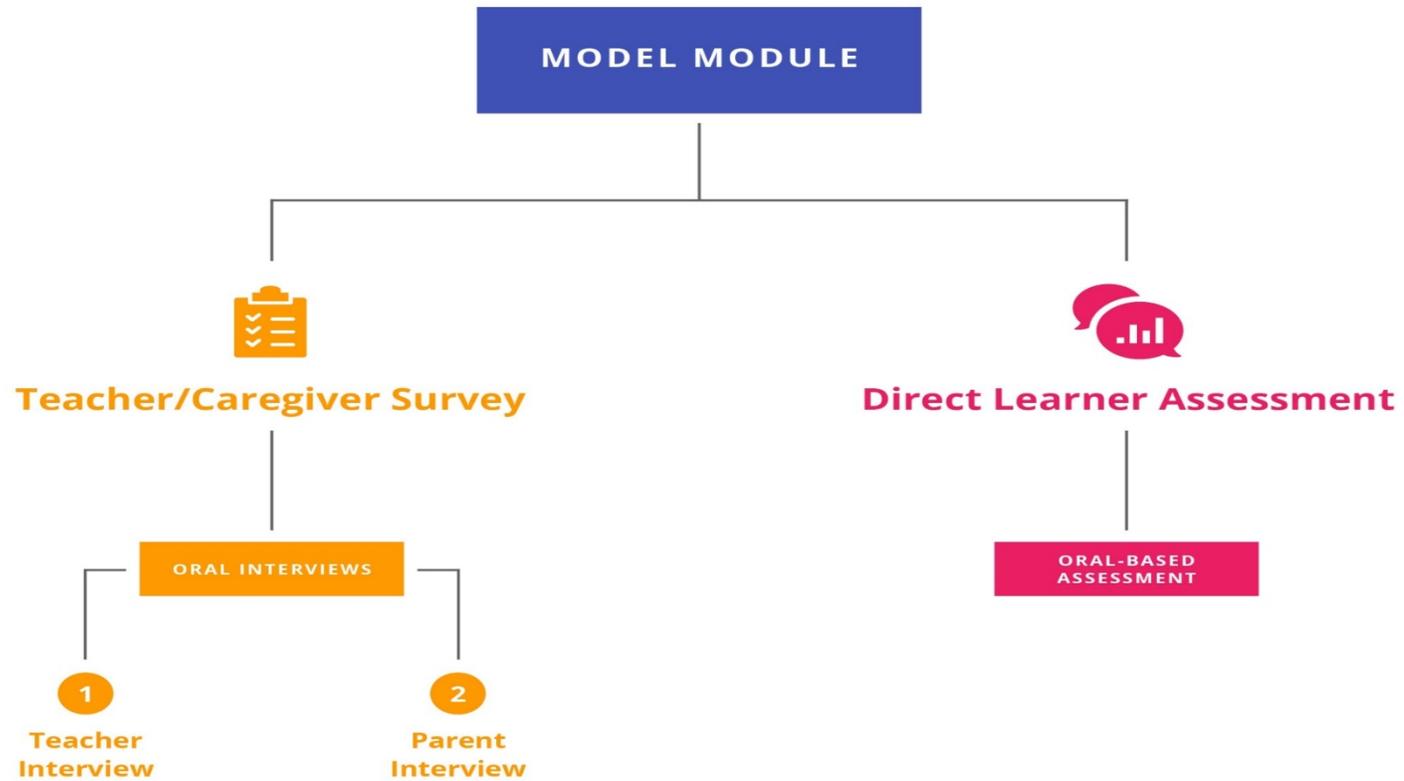
For quality, “compare”
at the construct level
(Option 3)

TOOLS USED TO INFORM MELQO MODULES



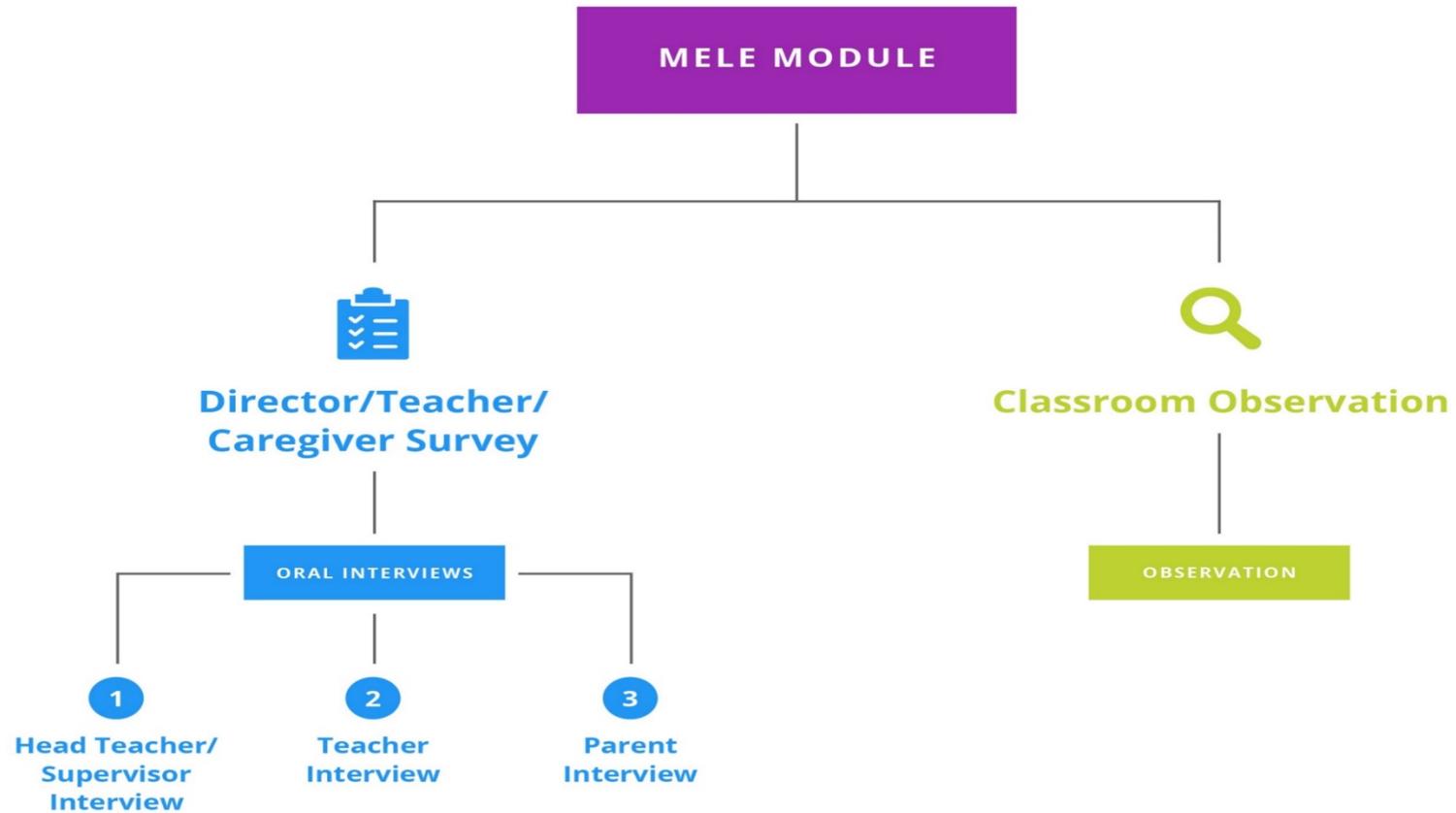
MODEL INSTRUMENTS

How is information gathered?



MELE INSTRUMENTS

How is information gathered?



CONSTRUCTS AND SAMPLE ITEMS FOR MELE

CONSTRUCT	 Play	 Pedagogy	 Interactions	 Environment	 Personnel	 Parent & Community Engagement	 Inclusiveness
DEFINITION	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.	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.	Type and quality of interactions between teachers and children, and between children and their peers.	Physical space and safety of the classroom, including access to clean water and toilets, and adequate space for each child.	Experiences of teachers and directors in training, years of service, compensation, supervision and mentoring.	Extent to which parents and community members are encouraged and able to engage in children's education.	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.
SAMPLE ITEMS	<ul style="list-style-type: none"> • 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? 	<ul style="list-style-type: none"> • 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? 	<ul style="list-style-type: none"> • 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? 	<ul style="list-style-type: none"> • 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? 	<ul style="list-style-type: none"> • 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? 	<ul style="list-style-type: none"> • 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? 	<ul style="list-style-type: none"> • 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

Key Concepts: play-based teaching

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

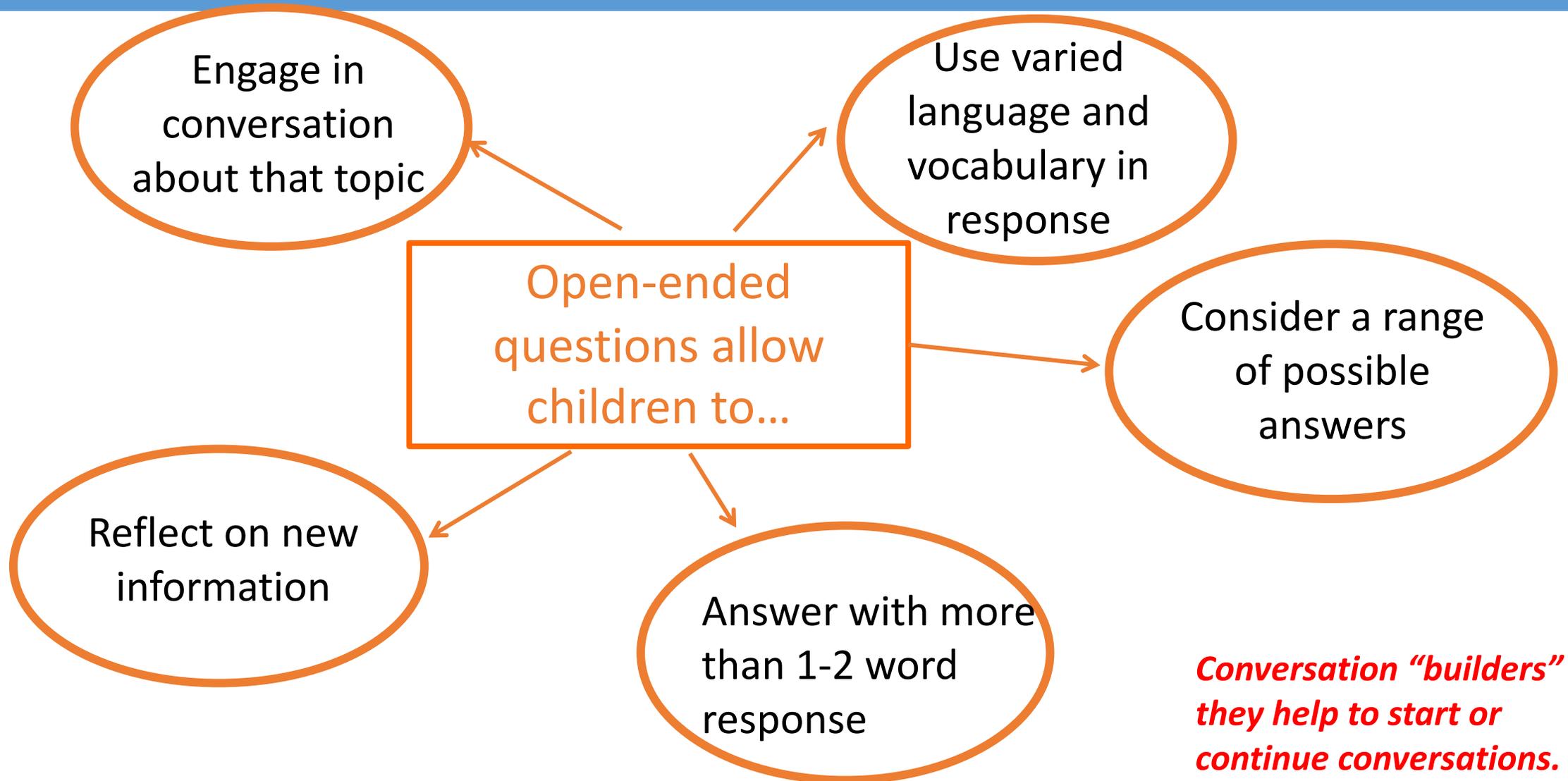
A Few Years Later ... Where Are We?

- 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

Key Concepts: closed-ended vs open-ended questions



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



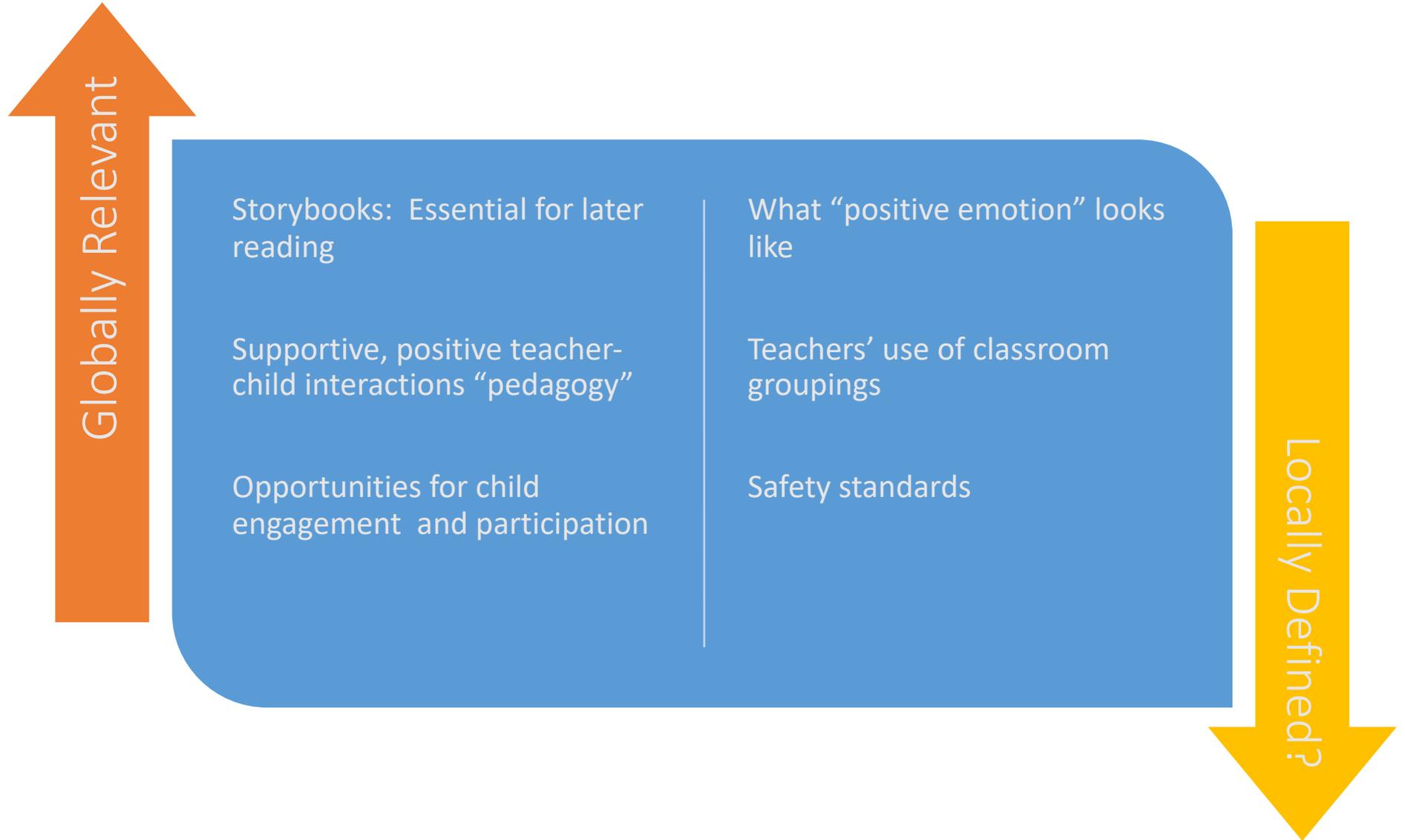
With whom you play cooking dear? With Mother

Learning about nutrition foods through conversation and materials



Movement & Music: Learning Body Parts through song

Globally Relevant or Locally Defined?



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*



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.

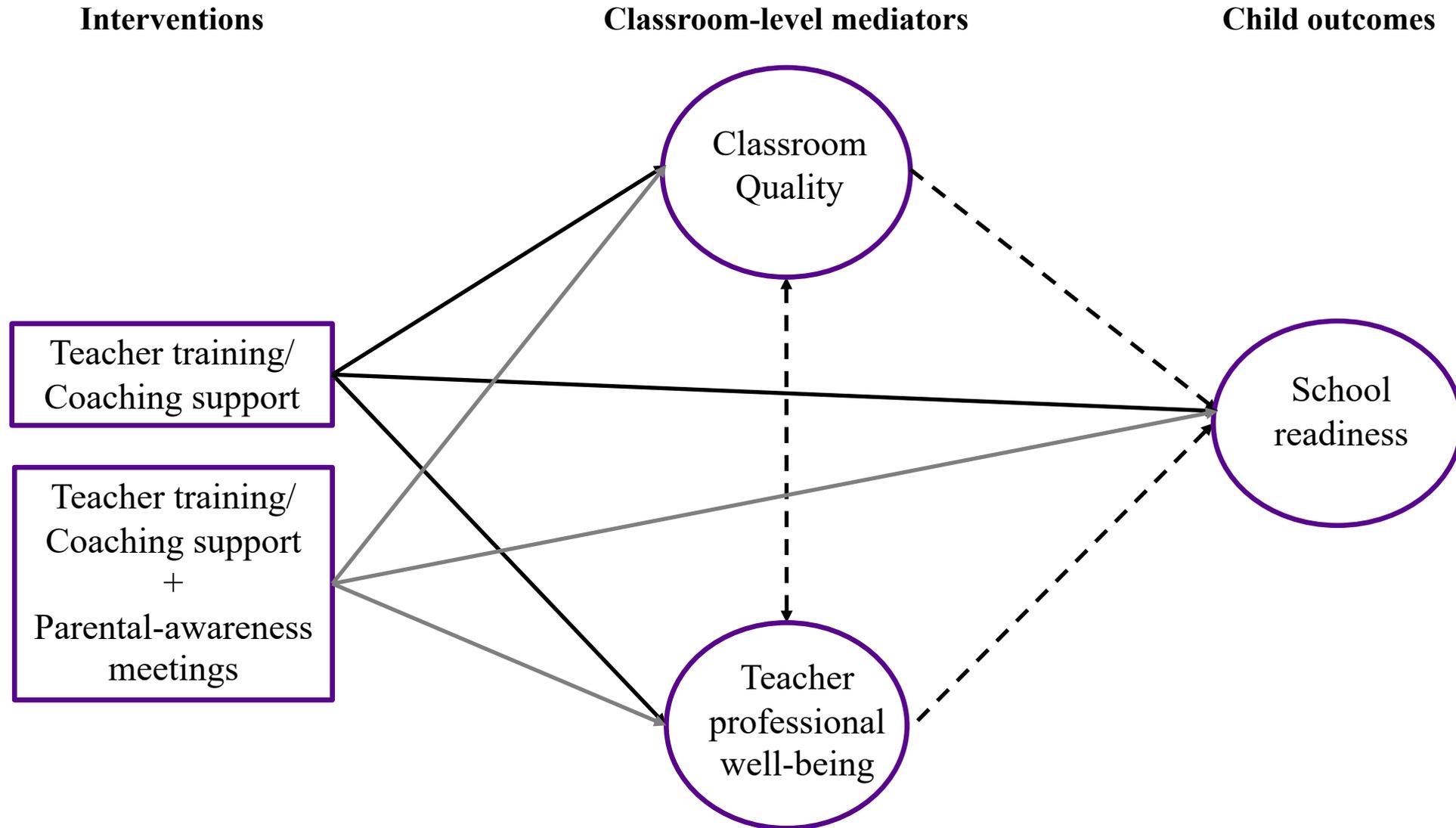
The In-Service Teacher Training Program

- 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

QP4G Theory of Change



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

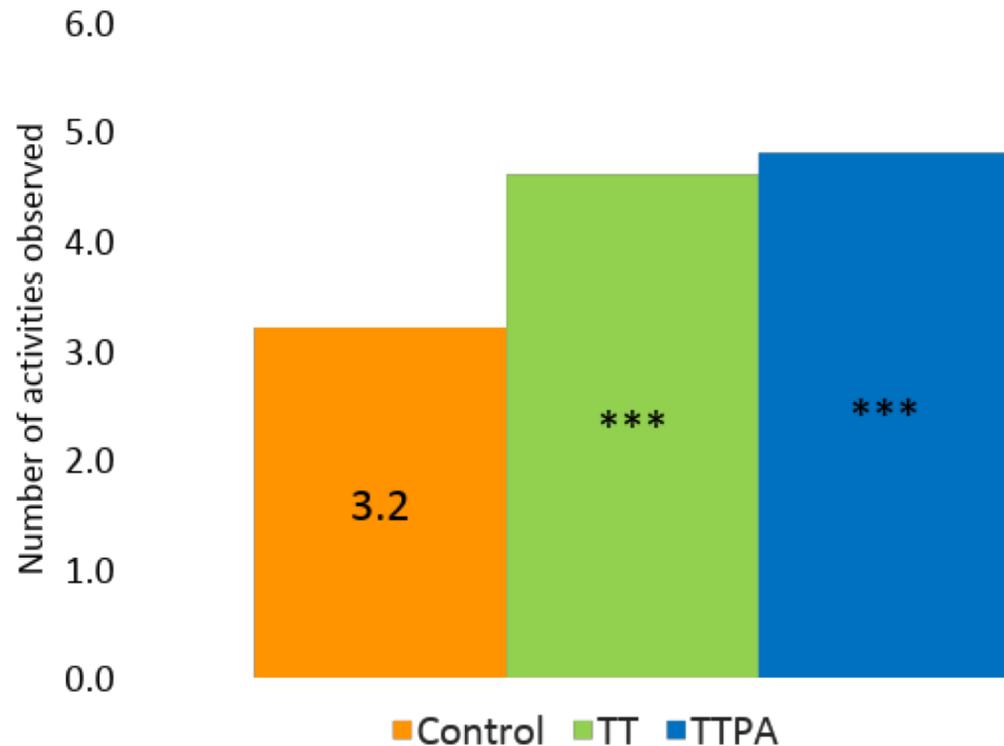
Teacher asks students at least two open-ended questions during the class

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



TT= Teacher training; TTPA = Teacher training + Parental awareness training

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*

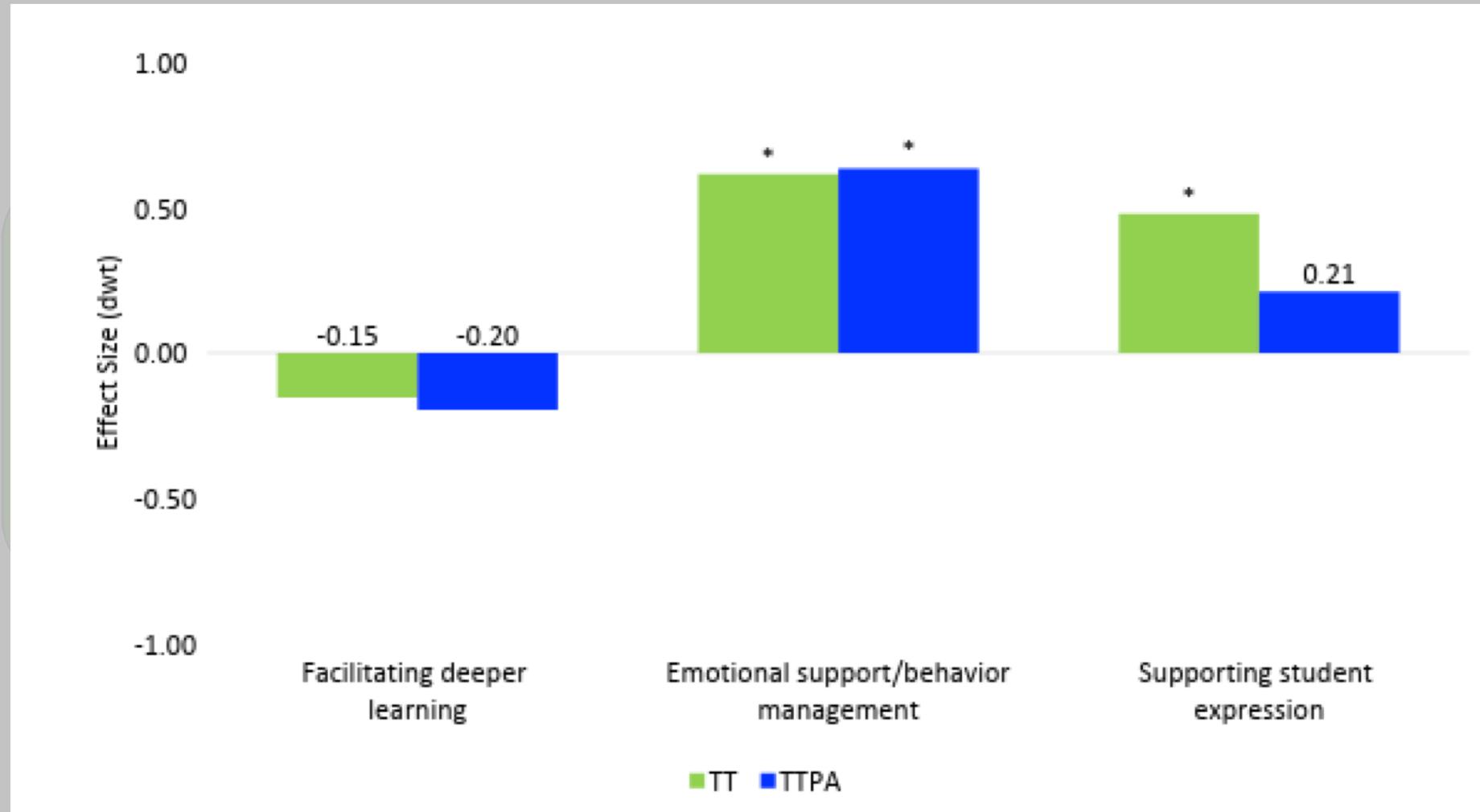
Emotional support & behavior management

- *Positive climate*
- *Negative climate*
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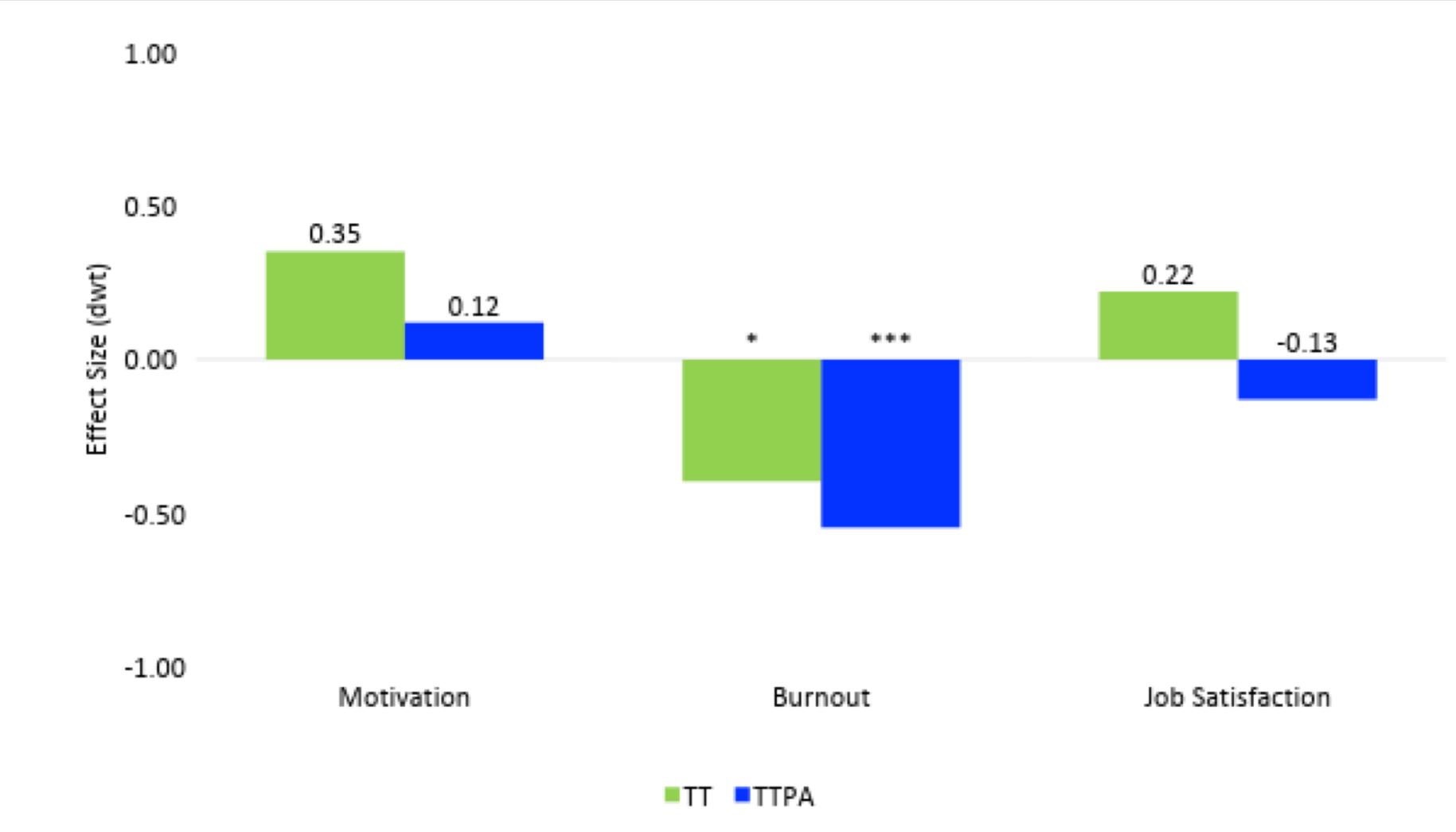
Supporting student expression

- *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

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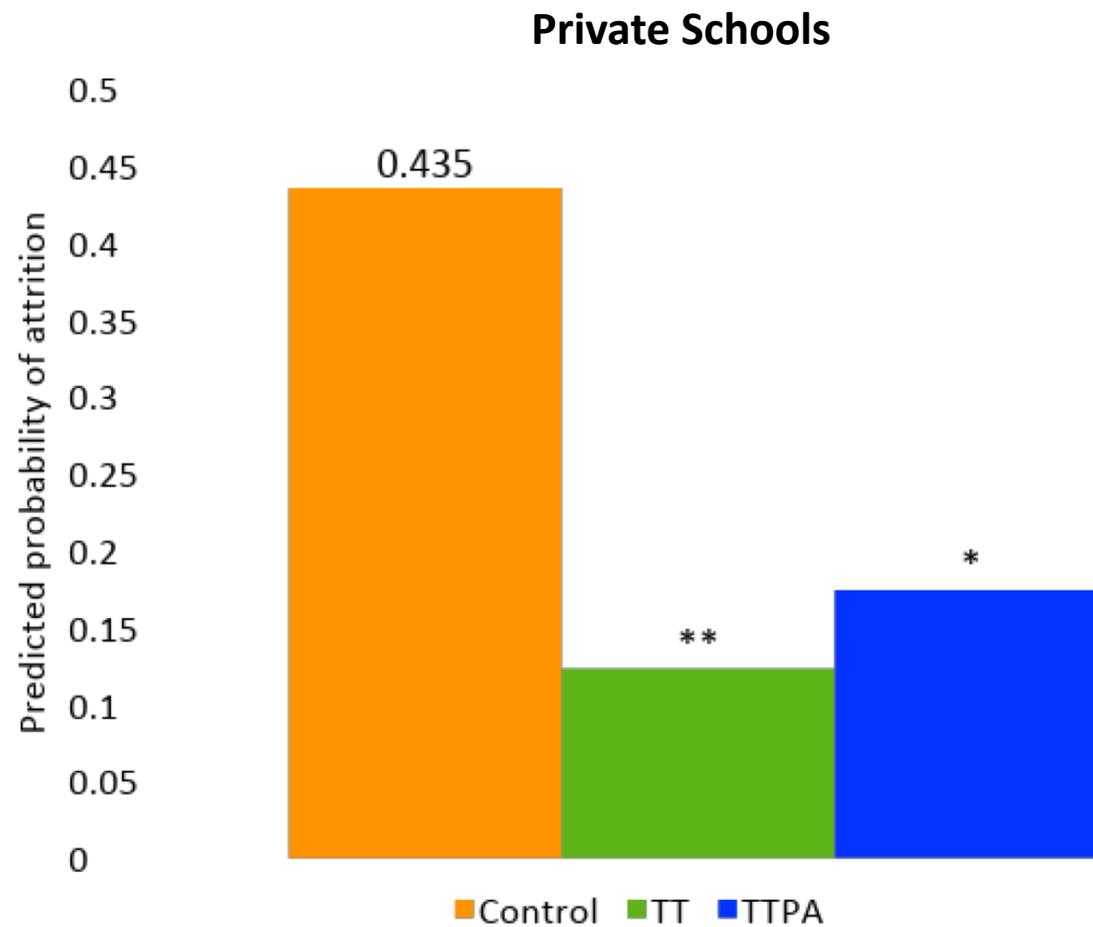
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Teacher attrition: Does QP4G reduce the likelihood that teachers' leave the school mid-year?

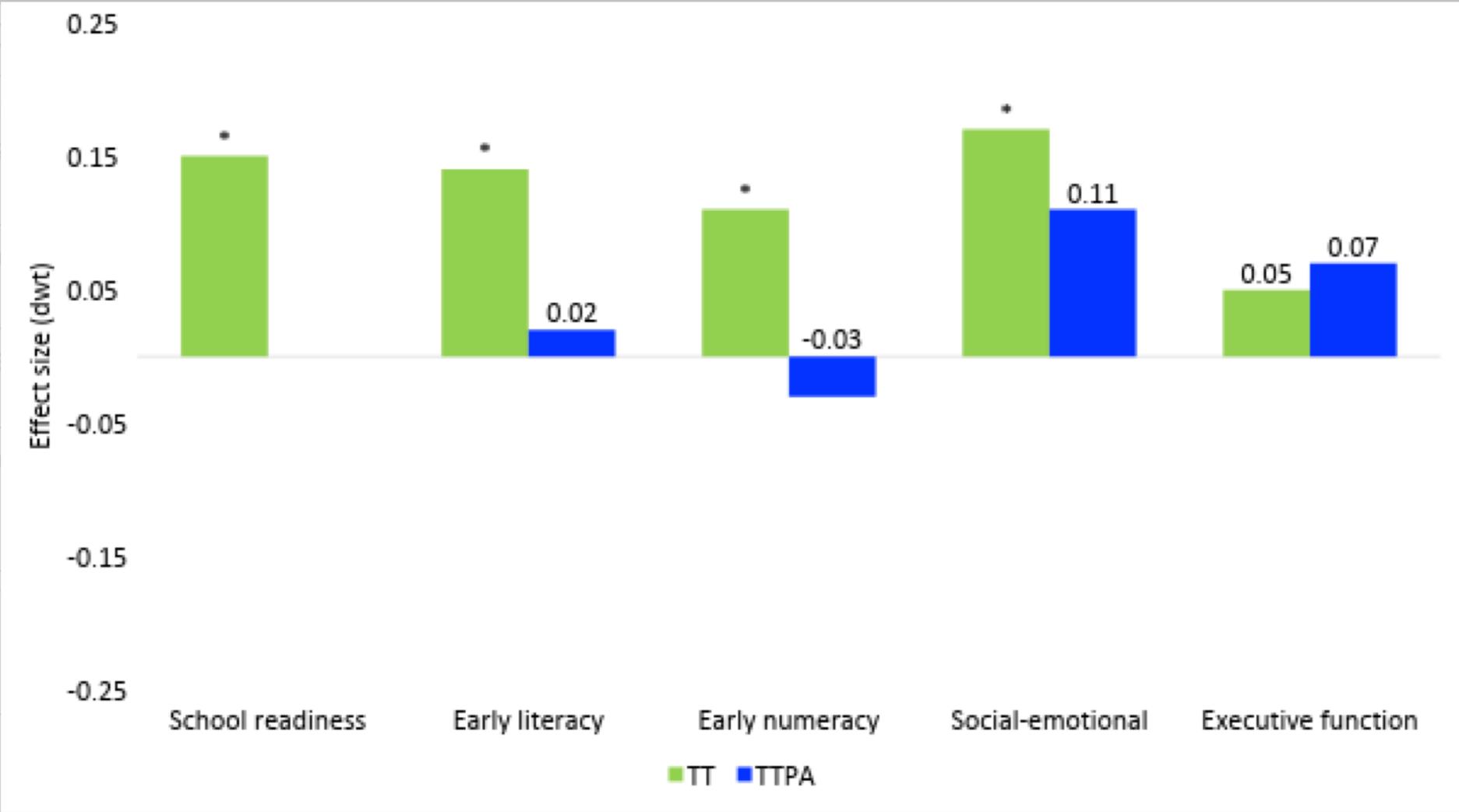
YES

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



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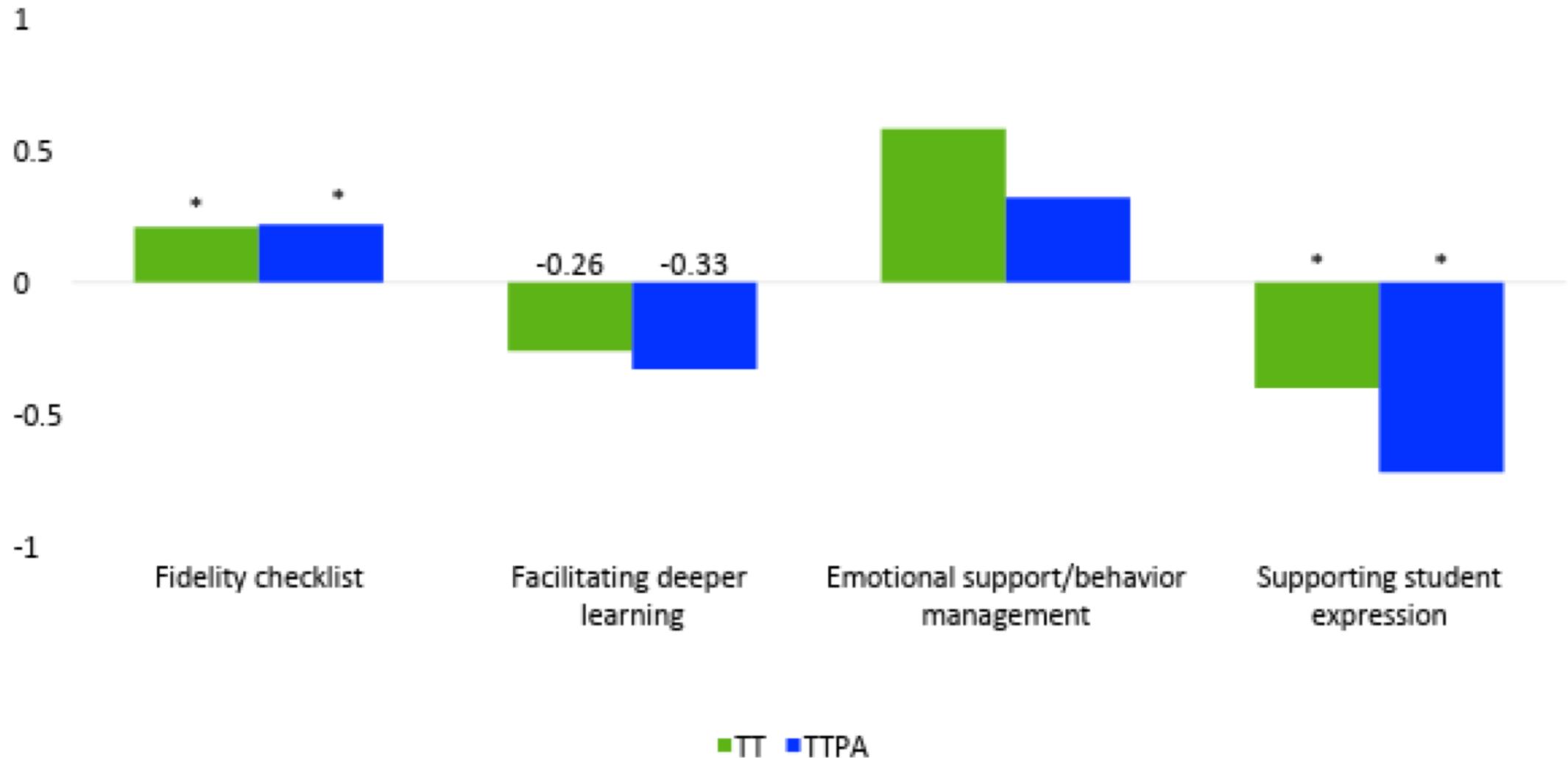
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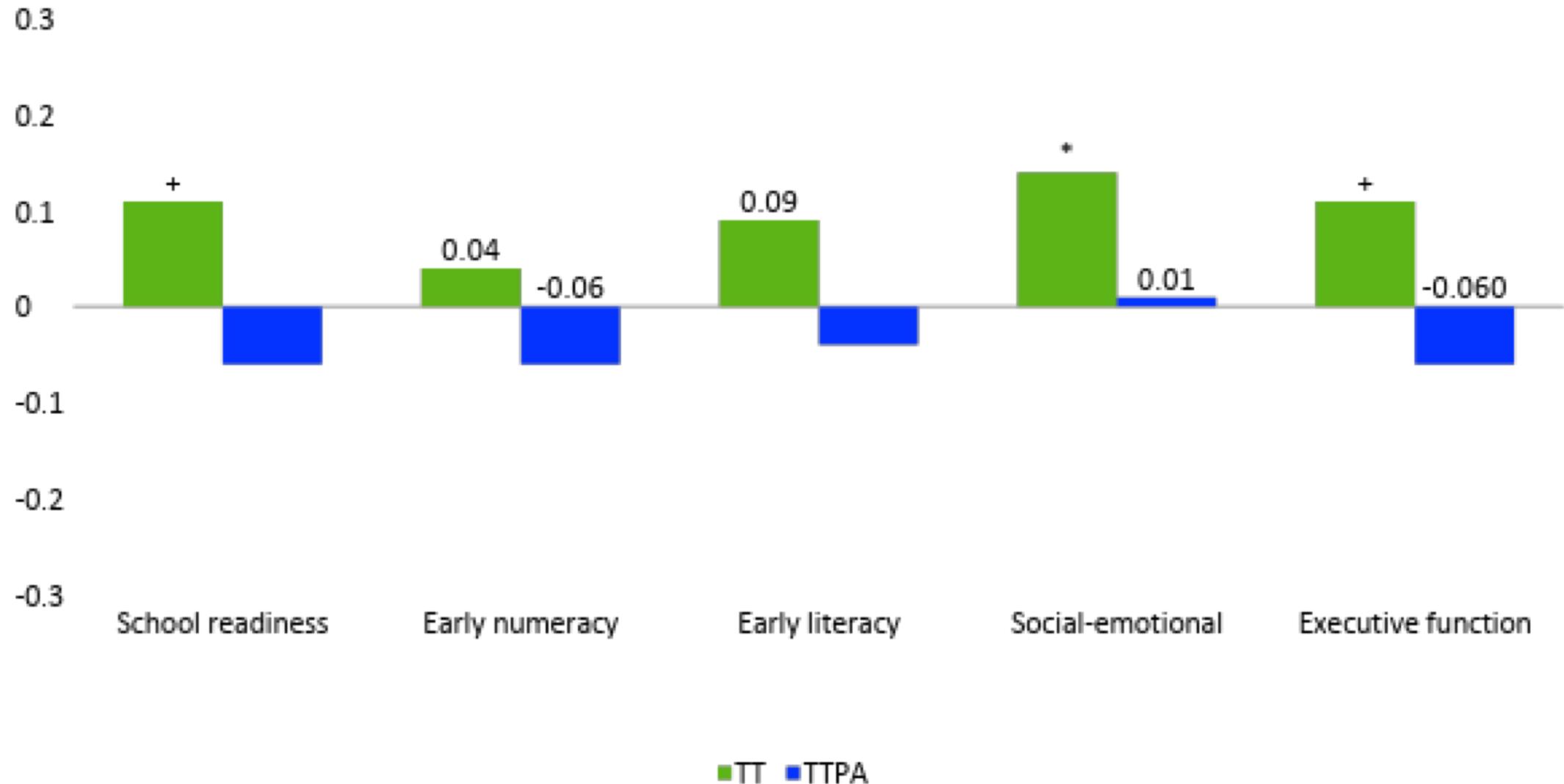
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One year later: Teachers are still using some of the training practices, but other impacts have faded out or become negative



One year later: Impacts on social-emotional outcomes sustained



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.