

## LEGO Playful Learning Across the Years (PLAY) Measurement

### Technical Consultant: Analysis Support

#### Statement of Work

##### Background

Mounting evidence shows that in education systems around the world, children’s learning is limited, and as a result, even after several years of schooling, millions of children lack basic skills and competencies. Over time, this has contributed to widening the inequality and learning gap, with those who are already most disadvantaged falling even further behind.

We know that play has the potential to transform this global learning crisis. In infancy and early childhood, play builds a strong foundation for later learning by improving brain development and growth. In education systems that lack capacity to support children effectively, play brings its own powerful engine to drive learning—the joyful, engaged intrinsic motivation of children themselves. In this way, play contributes to the holistic development of children, helping to prepare them for the challenges of the current and future world. Accordingly, there is an urgent need to improve measurement of playful learning, in order to be able to add to the evidence base on what the benefits of play are, how playful learning takes place, and how it can be promoted at home and at school for children of all ages.

To address this challenge and as part of the LEGO Foundation-funded PLAY Measurement activity, RTI and NYU TIES have developed a set of tools for measuring how settings (classrooms and homes) support children’s engagement in their learning. Tools have been developed in 0-2, 3-5 and 6-12yrs age groups. The focus of this SOW is on the **6-12 year** age group based on primary school classrooms. The toolkit consists of a classroom observation tool, a student survey and a teacher survey in two parts: self-reported instructional practices and responses to a vignette-based questions. All three tools aim to measure 7 dimensions of adult-child interactions hypothesized to support student engagement: connection to experience, problem solving, exploration, agency, participation, positive emotional climate and social connectedness.

The primary school tools have gone through three phases (Build, Adapt, and Test) in Kenya and Ghana. As part of this SOW, data from the Test phase – from approximately 150 schools, 150 teachers and 750 students in each country - will undergo psychometric testing to determine overall reliability and validity of the tools.

##### Scope of Work

The consultant will support RTI and NYU in:

1. Designing the analysis of psychometric properties of the tools based on pilot data.

2. Conduct the analysis of psychometric properties of the tools based on pilot data
3. Provide code and guidance to be included in a toolkit.
4. Make recommendations for further analysis and revisions of the tools, based on the analysis
5. Liaise with statisticians analysis comparable data sets in the 0-2 and 3-5 age groups to ensure alignment of analytical approaches.

**Specific tasks under this scope of work may include:**

1. Develop an analysis plan to assess psychometric properties of the tools including:
  - a. Use descriptive statistics and IRT to understand variability and level of difficulty of individual items and assess items for plausible relationships with age.
  - b. Assess the inter-rater reliability of the measures/scales.
  - c. Assess classroom observation, child survey and teacher survey tools for construct validity, by assessing alignment between underlying constructs identified through confirmatory and exploratory factor analysis and those in the conceptual framework.
  - d. Assess the relationship between the classroom observation, child survey and two teacher survey tools.
  - e. Based on generalizability (G-) theory, assess reliability by analyzing the different sources that contribute to variation in the observations.
  - f. Assess equity – for example gender equity – through standard procedures for differential item functioning and measurement invariance analysis (e.g., Halpin et al. 2019).
  - g. Conduct analyses to identify items that meet psychometric criteria to constitute two forms of each assessment. The long-form assessment will reliably assess each dimension of playful learning whereas the short-form assessment will provide an overall score with acceptable reliability.
  - h. Conduct cross country comparisons as well as other necessary measurement invariance analyses.
  - i. Conduct analyses using a multitrait-multimethod measurement approach.
2. Develop open-source, publicly available statistical code that comply with current Open Science standards (van der Zee & Reich, 2018), with the aim of providing automated, standardized, and transparent approaches to analysis of the final toolkit.
3. Guide the team in correctly implementing automated processes using statistical software for conducting psychometric analyses; guide the team in output interpretation of statistical results.
4. Provide guidance in the recommendations and guidelines of uses of each of the tools based on psychometric evidence.

5. Participate in consultation meetings/discussions with RTI and NYU as needed. In particular, to liaise with the statistician leading analysis of 0-2 and 3-5yrs data sets to ensure alignment of analytical approaches.

**Deliverables**

- Analysis plan.
- Results of statistical analysis
- Open-source statistical code and written analysis guidance to be included in the final toolkit.

**Estimated Level of Effort**

Level of effort is a maximum of 20 days.

**Period of Performance**

On or about July 8, 2022 – Sep 31, 2022

**Daily rate** TBD

**Preferred Qualifications**

- Bachelor's Degree and 5 years of experience, Master's degree and 3 years of experience or PhD and 0 years of experience, or equivalent combination of education and experience in education, statistics, psychology, or a related field;
- Proficient with data analysis software such as STATA, Mplus, etc;
- Experience conducting psychometric testing to determine validity and reliability of measurement tools;
- Good communication and report writing skills;
- Strong analytical and planning skills;
- Availability during the estimated activity time frame.

To apply, please send your CV and preferred daily rate to Lauren Edwards ([laedwards@rti.org](mailto:laedwards@rti.org)). CVs will be reviewed on a rolling basis.