

The **LEGO** Foundation[♥]

Developing the 'Playful Learning Across the Years' (PLAY) Toolkit



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Background and Aims

Supporting children's learning through play has the potential to transform the global learning crisis by addressing several policy challenges. First, despite a recent focus on improving education quality, there is little evidence of a large-scale meaningful improvement in learning outcomes. Learning through play offers mechanisms by which these learning outcomes can be improved. In infancy and early childhood, play builds a strong foundation for later learning by improving brain development and growth.ⁱ In education systems that lack the capacity to support children effectively, playful learning brings its own powerful engine to drive learning—the joyful, engaged, intrinsic motivation of children themselves.ⁱⁱ Second, a global focus on standardised reading and mathematics assessments has narrowed the domains of learning targeted by national policies. Learning through play can help broaden this focus to include an emphasis on creativity, agency, social engagement, and problem solving - in addition to literacy and numeracy skills - contributing to a more holistic view of children's development. Evidence on how adults can support playful learning in families, centres, and schools is lacking, particularly in low- and middle-income countries. This is, in part, due to the lack of instruments to assess support for playful learning and insufficient research to understand cultural and contextual variations in the concept of playful learning. To address these gaps, the PLAY (Playful Learning Across the Years) Measurement project described in this report aimed to develop and assess a culturally responsive toolkit for measuring support for playful learning in home, centre, and school settings across age groups from birth to 12 years.



Playful learning brings its own powerful engine to drive learning—the joyful, engaged, intrinsic motivation of children themselves



Conceptual Framework

The conceptual framework that guided the development of this toolkit consists of two pillars. First, we argue that a key aspect of learning through play is “self-sustaining engagement in learning,” which we propose underpins the five characteristics of learning through play: joyful, meaningful, engaging, socially interactive, and iterative (see Figure 1).ⁱⁱⁱ We describe self-sustaining engagement as being voluntary, being intrinsically motivated, and having some of the characteristics of “flow” experiences (effortless focus and absorption in the activity). The second key aspect of learning through play is that it leads to a broad range of cognitive and non-cognitive outcomes. These two aspects of learning through play give rise to the following characterization of the PLAY toolkit's purpose:



The PLAY toolkit measures how adults support children's self-sustaining engagement in learning, leading to a broad range of learning outcomes.

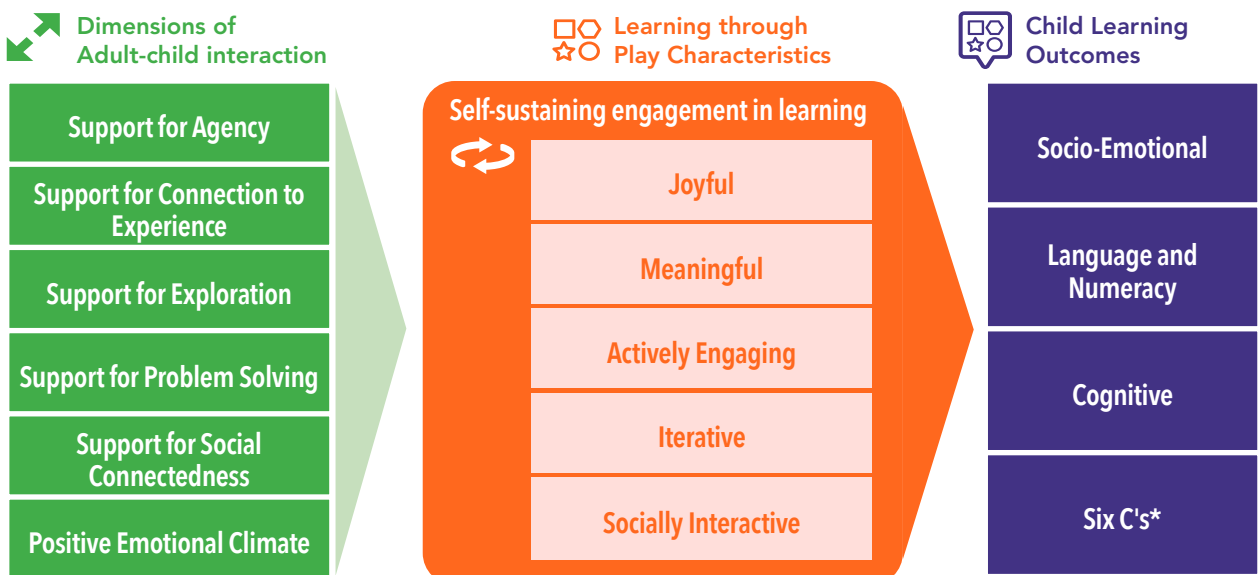
Based on a review of the literature, we argue that children's self-sustaining engagement is supported by adult-child interactions along six dimensions (which we call "constructs"). These six constructs are what the PLAY toolkit measures (Table 1).

TABLE 1: Constructs of support for children's engagement in learning

CONSTRUCT	DEFINITION
Support for agency	Adult support for children's ability to influence how and what they learn
Support for connection to experience	Adult support for children's learning that relates to their personal experience
Support for exploration	Adult support for children's learning through manipulation, investigation, and acting on the physical or conceptual world
Support for problem solving	Adult support for children's efforts to achieve a learning goal for which they do not have an automatic solution
Support for social connectedness	Adult actions to strengthen, build on, or show the importance of social relationships in the class between teacher and student and among students themselves for the collective good
Positive emotional climate	An environment where interactions between adult(s), child(ren), and peers are warm, respectful, and positive

Figure 1 illustrates the theory of change showing how the six constructs of adult-child interaction support self-sustaining engagement, underpinning the five characteristics of learning through play, which in turn leads to a broad range of cognitive and non-cognitive outcomes. The current project — **PLAY 1.0** — assesses whether adult support for self-sustaining engagement consists of the six proposed dimensions. The next phase of the work — **PLAY 2.0** — will examine the link to learning outcomes. *Note, the concept of 'self-sustaining engagement' and the related five characteristics or learning through play are not measured directly by the PLAY measurement project.*

FIGURE 1: Theory of change showing how adult-child interactions that support self-sustaining engagement lead to learning outcomes



* The six C's are collaboration, communication, confidence, content, creative innovation, and critical thinking.

Applying the Tools in Different Contexts

The PLAY toolkit was designed to be applicable across contexts. We developed an approach to adaptation that we used in developing the tools and in writing guidance for users to adapt the tools to their context. The approach considers three aspects of context:



Culture. We aimed to make the toolkit applicable across cultures, whether Western, educated, industrialized, rich, and democratic settings, on the one hand, or rural communities in low- and middle-income countries engaged in subsistence livelihoods, on the other. We identified five areas in which playful learning may differ across such cultures and used these areas to guide qualitative research and tool development in each context:

- **Adult-directed activities.** In subsistence communities, hierarchical relationships are emphasized.^v In these cultures, it is common for adults to direct activities and for children to observe or comply.
- **Relatedness and a sense of belonging.** Children's compliance with adult direction can be seen in the context of benefits to children in terms of a sense of belonging and a strengthening of relationships with adults and the community.
- **Play partners.** Adults are more likely to be dyadic play partners in Western middle-class societies. In other cultures, adults are less likely to be involved in play that occurs among children, and adult involvement may even be seen as limiting the playfulness of an activity.
- **Integration of play and work.** Children in subsistence communities are more likely to try out work-like activities in a playful manner.^{vi}
- **Goals of play and learning.** Parents in Western middle-class societies engage children in pretend play, in part to develop children's imagination and creativity. In other societies, such play emerges without much parental encouragement, as children imitate household and community routines in their independent peer play.^{vii}



Policy and system capacity. Support for learner engagement in the classroom can be affected by both policy and system capacity. Some education systems adopt reform efforts to increase the use of pedagogies to support playful learning and children's engagement. The PLAY toolkit was designed to be used in a range of education systems with different levels of support for learner engagement. Items in the toolkit can be adjusted to contexts in which support for learner engagement is widespread or to contexts where support for learner engagement is beginning to develop.



Humanitarian and crisis settings. There are several aspects of tool design that need to be considered when working in crisis and humanitarian settings, including the stress facing teachers and caregivers; the culture, language, and participation of displaced populations; and the practicalities of data collection in dynamic, transitory, or highly restrictive contexts.^{viii}



The PLAY toolkit is adapted to the culture; policy and systems capacity; and humanitarian issues in each context

**TEXT BOX 1: INTENDED USES AND USERS OF THE PLAY TOOLS**

The PLAY toolkit can be used in situations requiring an objective, reliable assessment of adult support for learner engagement. Examples include:

- impact evaluations of programs or interventions in homes, centres, or schools that intend to support children's engagement and learning
- assessing the implementation of a program or intervention to support children's engagement and learning
- national or regional monitoring efforts that focus on how education and other service systems are supporting child and student engagement and learning in homes, centres, or schools

The toolkit is designed for use across a range of contexts including low-, middle- and high-income countries and in humanitarian settings.

Design of the PLAY 1.0 Toolkit

This toolkit contains sets of tools for use in multiple age groups across different settings. For the birth to 2-year-old age group, the tools assess support for children's engagement in the family, largely through interactions between the caregiver and child. In the 3- to 5-year-old age group, the tools measure support for engagement in the family and the classroom or centre. Tools for the 6- to 12-year-old age group focus only on the classroom.

Figure 2 shows the types of tools contained in the toolkit. For each participant group, there is an observation tool and a survey with an adult (a teacher in classroom settings and a caregiver in home settings) to assess self-rated behaviour. For the 6–12 group, there is also an interview with students to assess self-rated behaviour. In both the 3–5 and 6–12 age groups, there is also a classroom inventory to assess other aspects of the classroom, such as materials displayed on the walls, which might support self-sustaining engagement in learning. The tools measure each construct with a number of items – specific behaviours involving an interaction between an adult and a child or children. In most cases, the tools were designed to measure all six constructs of support for engagement in learning (although only four constructs were retained after subsequent analysis). One exception was the Caregiver-Child Observation Tool in the birth–2 group, which measures only four constructs; problem solving and connection to experience are not applicable to this age group. The two classroom inventory tools were designed to capture information about physical space and materials and were not systematically designed around the six constructs.

FIGURE 2: Overview of tools

	0-2 years Home-based				
			Caregiver-child observation	Caregiver Survey	
	3-5 years Home-based				
			Caregiver-child observation	Caregiver Survey	
	3-5 years Classroom-based	Classroom inventory	Teacher-child observation	Teacher Survey	
	6-12 years Classroom-based	Classroom inventory	Teacher-child observation	Teacher Survey	Child Survey

Data Collection to Develop and Test the Toolkit




FIGURE 3: On-the-ground adaptation and testing of the PLAY toolkit



The PLAY toolkit was developed through 3 phases of data collection in each of 4 countries

The PLAY Measurement toolkit is strongly evidence based, having been developed through several phases of data collection in four countries (Figure 3). The birth–2 tools were adapted and tested in Colombia. The 3–5 tools were adapted and tested in Jordan and Colombia. The 6–12 tools were adapted and tested in Kenya, Ghana, and Colombia. Table 2 shows the stages of data collection involved in developing and validating the toolkit.

TABLE 2: Overview of tool development methods

	PILOTING PHASE	METHODS
Build 	<ul style="list-style-type: none"> Understand local perceptions of playful learning and engagement Extend and adapt core constructs Generate and adapt items to context 	Teacher-child interaction observations; teacher/caregiver focus groups; classroom naturalistic observations; point-of-view observations and drawing focus groups with children
Adapt 	<ul style="list-style-type: none"> Assess respondent and data collector understanding 	Cognitive interviews and piloting with respondents to ascertain their understanding of and response to assessment items
	<ul style="list-style-type: none"> Pilot and revise 	Medium-scale pilot sample of all tools; data collection to inform replacement and revision of test items
Test 	<ul style="list-style-type: none"> Conduct psychometric assessment 	Large-sample data collection as basis for factor analyses



Build Phase

The aim of the Build phase was to document local understanding of key terms in order to build the constructs and items in the various tools. The methods focused on the local perception of play, playful learning, and engagement in learning, using observations in classrooms, interviews and focus groups with teachers and caregivers and discussions with children based around drawings we asked them to produce.

The build phase found evidence for our six proposed constructs and led to the extension of some of the constructs. For example, there was evidence that adults engage children in work-like play, which helped expand the characterisation of the “support for agency” construct and the “support for connection to experience” construct.

We adapted our framework somewhat to account for local conceptions of agency. Teachers in Kenya and Ghana described a view of agency that differed from our framework. They felt that explicit direction from teachers was required for students to be able to act independently. In response to this finding, the PLAY observation tools were designed to be sensitive to relatively subtle expressions of child agency in the classroom.



The design of the **PLAY** toolkit was informed by local perceptions of ‘play’, ‘playful learning’ and ‘engagement in learning’



Adapt Phase

In the Adapt phase, we used quantitative data to adjust the tools. In all countries, cognitive interviews and small-scale pilots were conducted to test respondent understanding of items (for surveys) and data collector understanding (for observations), as well as face validity of items.

We then revised tools and procedures based on feedback from data collectors and the analysis of Adapt phase data. For the primary school tools, we experimented with adding three constructs: negative agency, negative emotional climate, and participation. We also tried different approaches to coding, to the application of quality metrics in the observation instrument, and to administering the teacher and child surveys. For the early childhood education (ECE) tools (in the birth-2 and 3-5 age groups), feedback from data collectors helped simplify the language of several items. For both the ECE and the primary school tools, the process of training data collectors was refined during the Adapt phase.



Test Phase

In the Test phase, we collected data from a larger sample to assess whether the tools worked as intended. We assessed the primary tool in 75 classrooms in Colombia, 280 classrooms in Kenya and 278 classrooms in Ghana. We assessed the ECE observation tool in over 100 classrooms in Colombia and Jordan and administered the caregiver tools to around 150 caregiver-child dyads in Colombia. In addition, we leveraged existing videos of 423 ECE classrooms in Ghana, applying the PLAY observational tool to these recordings of classroom interactions.

One aim of the test phase was to assess the inter-rater reliability of tools, which is a measure of agreement between data collectors about how to classify observation data. A reliability greater than 0.7 is desirable. For the primary school observation tool, inter-rater reliability was 0.97 in Kenya, 0.81 in Ghana, and 0.57 in Colombia. For the ECE classroom observation tool, inter-rater reliability was >0.65 in Jordan and >0.70 in both Ghana and Colombia.

A second aim of the test phase was to assess whether the data supported our six hypothesised constructs. To address this question, we used factor analysis, a statistical approach to identifying groups of items that tend to be observed together. The groups of items – known as ‘factors’ – derived from the data can be compared to our hypothesised constructs. For each age group and tool, we developed a single factor model that had reasonable fit to the data across all contexts. This model formed the basis of our recommended final version of the tools, described in the next section.



The PLAY tools were assessed with data from more than 1,000 classrooms in 4 countries and with around 150 caregiver-child dyads

Recommendations

The activities described in this report constitute the first phase of PLAY tool development – PLAY 1.0. To guide users of the tool, we present recommendations for how the toolkit will be adapted in the next phase of work (PLAY 2.0). The recommended form of the observation tools consists of constructs derived from those identified in analyses (purple check marks in Table 3). We propose keeping some of the constructs (orange check marks in Table 3) that were not identified by analyses but which we believe would make an important contribution to the toolkit. For example, the positive emotional climate construct was not identified in the 6–12 years observation tool, but we included it because it was identified in the 3–5 years classroom observation tool. Similarly, we included the agency construct in the 3–5 years observation tool because it was identified in the 6–12 years observation tool. Based on analysis, we recommend merging the ‘social connectedness’ and ‘connection to experience’ constructs in the 3-5 and 6-12 classroom observation tools. The problem-solving construct was not supported by analysis, although some problem-solving items were grouped under the ‘exploration’ construct.

Data from survey measures with teachers supported all six constructs in ECE classrooms and four constructs in primary classrooms. For consistency, we recommend that these survey tools measure the same four constructs as the observation tools. Only two constructs were supported in the child survey measure.

For caregivers, the observation data supported three constructs in each age group. We recommend combining problem-solving and exploration to form one construct, and retaining the agency and social connectedness constructs. For the survey measures, we recommend including positive emotional climate, connection to experience and social connectedness.

TABLE 3: Constructs supported by the analysis of PLAY 1.0 tools**OBSERVATION MEASURES**

CONSTRUCT	CLASSROOM		CAREGIVER	
	6 – 12	3 – 5	BIRTH – 2	3 – 5
Problem solving				✓
Exploration	✓	✓		
Agency	✓	✓	✓	✓
Positive emotional climate	✓	✓		
Connection to experience	✓	✓		
Social connectedness			✓	✓

**SURVEY MEASURES**

CONSTRUCT	CLASSROOM			CAREGIVER	
	TEACHERS 6 – 12	CHILDREN 6 – 12	TEACHERS 3 – 5	BIRTH – 2	3 – 5
Problem solving	✓		✓		
Exploration	✓		✓		
Agency	✓	✓	✓		
Positive emotional climate	✓	✓	✓	✓	✓
Connection to experience	✓*		✓*	✓	✓
Social connectedness				✓	✓



Constructs supported by analysis



Constructs not supported by analyses but retained in the tool

* Data support two separate constructs, but constructs are combined to match the observation tool

Which Tools to Use?

For each of the four participant groups, there is an observation tool and an adult survey tool. These tools are designed to complement each other, and we recommend using them together (the “comprehensive approach” in Table 4). If only one of these tools (the “parsimonious approach” in Table 4) is to be used, we recommend using the observation tool, for two reasons: (1) observational tools have less bias than may be involved in self-reported behaviours like teacher-reported practices in their own classroom; and (2) items on observational tools may be more productively used in professional development for family support and education systems.

TABLE 4: Selection of tools to use based on evaluation or monitoring approach

APPROACH	TOOLS
Comprehensive	<ul style="list-style-type: none"> • Observation • Adult survey • Student survey (for primary age group only)
Parsimonious	<ul style="list-style-type: none"> • Observation only
Focus on learner perspective	<ul style="list-style-type: none"> • Include student survey (for primary age group) in set of tools
Focus on evaluation or monitoring of an intervention	<ul style="list-style-type: none"> • Include observation tool in set of tools

When the toolkit is being used to monitor or evaluate an intervention targeted at adults (e.g., a teacher training), the intervention may bias the adults' subject ratings. For such purposes, we strongly recommend using the observation tools ("focus on evaluation or monitoring of an intervention" in Table 4).

For the 3–5 age group, there are two sets of tools—one for use in the classroom and one for use with caregiver-child dyads (which can be arranged in the home or in schools/centres). These sets of tools can be used independently or with the same sample of children observed at home and in the classroom.



TEXT BOX 2: HOW DO THE PLAY TOOLS RELATE TO OTHER MEASURES OF EDUCATION QUALITY?

The PLAY Measurement toolkit adds to a number of other measures of education quality currently in use. This is how PLAY relates to such measures:

- Like other quality measures, PLAY has a **domain-general**, rather than subject-specific, focus.
- Like other quality measures, PLAY measures **adult-child interactions**. However, unlike existing quality measures, PLAY focuses only on specific adult-child interactions, namely those that support **self-sustaining engagement** in learning.
- The PLAY toolkit includes constructs measuring support for children's self-sustaining engagement in learning that are currently lacking or measured only in a light-touch manner.
- PLAY aims to measure adult-child interactions that promote a broad range of child outcomes.



Next Steps

In the next phase of this work—PLAY 2.0 running from 2023-2025—we will further refine the constructs and items in the PLAY toolkit based on the analyses conducted in PLAY 1.0. We will support four organizations in five countries in using the updated PLAY 2.0 toolkit and, through this process, collect data to validate the tools against cognitive and non-cognitive learning outcomes.

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