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Lessons Learned from the Tech & Play Initiative

Insights to Inform Program Design and Implementation

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Introduction

ABOUT THE RESEARCH

This brief summarizes insights from the Tech & Play initiative. It does not include the full evidence base behind each lesson. For more detail, see the country-specific research briefs and evaluation reports at edc.org/projects/lego-foundation-scaling-learning-through-play-with-technology-research-collaborative/.

This brief shares lessons learned from the LEGO Foundation-funded Tech & Play initiative in Kenya, Rwanda, and Brazil. The initiative aims to transform primary school learning through play-based pedagogy and technology that promote student-centered, active learning.

Over four years, EDC partnered with researchers from EDU (Kenya), Three Stones International (Rwanda), and LEPES (Brazil) to conduct both formative research and studies on intervention implementation and teacher outcomes. Research teams worked alongside implementing partners to carry out the research, including Right to Play (Kenya), IREX (Rwanda), and Creative Schools (Brazil). Despite substantial differences in program design and context across these three countries, common lessons emerged on how to implement initiatives to improve student-centered instruction.

Drawing on research from all three countries, this brief offers practical insights and real-world examples to help implementing partners strengthen program design and implementation. It is created as a tool to support implementing partners in designing and adapting education technology programs to their specific contexts.

Each section presents a key lesson, an implementation example, design implications, and guiding questions to support reflection and learning.

We encourage you and your team to reflect on these insights to identify what's working, where change is needed, and how to strengthen support for teachers and learners.

Consider Teachers' Strengths and Diverse Needs when Designing Professional Development Programs

1

Instructional improvement should be guided by a theory of teacher learning that reflects evidence and recognizes that change is developmental and takes time.

As teachers build skills, try new strategies, and integrate them into their routines, their learning needs evolve. Effective approaches tailor supports to meet teachers where they are, offering the right balance of challenge and guidance at each stage.

In Practice

In Kenya, KPLAY's experience demonstrated that teachers enter with vastly different starting points, particularly in digital literacy. Initial training focused on Scratch, a coding platform for children, but many teachers lacked basic computer skills and device access. The program adapted to provide foundational support by first building teachers' confidence with basic digital tools, before introducing more advanced technology integration. Shifting to student-centered learning also represented a major change for most teachers, requiring more than just new activities. KPLAY modified their training to begin with foundational mindsets, helping teachers develop the habits of regular reflection on their practice and focus on continuous improvement before expecting teachers to implement new techniques.

IMPLICATIONS
for Program Design and Implementation

- Assess teachers' strengths and needs, and tailor support to meet them where they are.
- Design ongoing, staged support that builds from foundational mindsets to new skills and strategies.
- Provide on-site, job-embedded support for teachers that integrates regular opportunities for coaching, modeling, and peer collaboration into the school day.

Questions for Consideration

- What do you know about teachers' starting points and prior experiences, and how are you using that information to differentiate support?
- How does your program support teachers' development over time?
- Do you provide frequent opportunities for teachers to practice, receive feedback, and reflect?

Connect

Student-Centered, Active Learning to

Conceptual Understanding

2

Active learning is most effective when it promotes deep conceptual understanding, not just student engagement. Teachers need clear guidance to design activities that are both playful and purposeful. Effective implementation integrates playful pedagogical methods with clear learning objectives in core subjects, helping students explore, question, and connect new ideas in meaningful ways.

In Practice

In Rwanda, many teachers created opportunities for students to build, tinker, and participate in hands-on tasks—but in many classrooms, these activities were not strongly linked to underlying science, engineering, and technology concepts.

For example, students built geometric models and ICT tools using manila paper and cardboard, but lessons often missed opportunities to explore material properties or apply scientific reasoning related to building and using models to learn about the world. Lessons emphasized following steps to create an object, rather than analyzing, testing, or reflecting on how the activity connected to curriculum-based science concepts.

IMPLICATIONS

for Program Design and Implementation

- Provide explicit lesson planning support that begins with clear learning goals and follows them across lessons in a unit to build conceptual understanding.
- Equip teachers with strategies to assess learning in ways that focus on students' conceptual understanding and ability to apply new ideas.
- Help teachers select topics that promote exploration and inquiry, emphasizing complex concepts over rote tasks.

Questions for Consideration

- How are teachers supported to connect activities to core academic outcomes?
- How will teachers know if students are actually learning through the activities?
- How are teachers supported to adapt and design creative, age-appropriate activities aligned with the curriculum?

Provide Well-Designed, Context-Specific Instructional Materials

that Support Teachers in Applying New Approaches

3

High-quality, context-appropriate instructional materials are essential for helping teachers apply new pedagogical approaches in the classroom.

Evidence from our research suggests that training alone is not enough to change practice; well-designed lesson plans and resources help bridge the gap by giving teachers opportunities to experience and practice student-centered instruction.

These materials model how to connect playful learning to core content, elicit and respond to students' contributions, and adjust instruction to meet learners' needs. To be effective, materials must align with local curricula and go beyond one-off activities, to sequence and connect content across lessons and deepen students' conceptual understanding over time.

In Practice

In Brazil, the Creative Schools program provided eBooks with model lessons and activity ideas for national Creative Learning campaigns. Teachers said that the eBooks helped them visualize what creative learning could look like in practice. Some followed the model lessons as written to build confidence with new strategies, while others adapted or created lessons inspired by the examples. This approach reduced the burden of designing from scratch while offering teachers flexibility. However, because the materials were tied to special campaigns and not fully integrated into the official curriculum, some teachers found it challenging to sustain use of creative learning approaches or connect the strategies to year-round academic goals.

IMPLICATIONS
for Program Design and Implementation

- Ground materials in the realities of local classrooms, considering resource constraints, class size, language, digital readiness, and other important factors.
- Reduce the burden on teachers by providing clear models and examples that go beyond one-off activities and show how to apply strategies across a sequence of lessons, assess learning, and adapt to student needs.
- Involve teachers early in the design process to ensure materials are relevant, practical, and centered on real needs.
- Plan for sustainability by using locally available materials and building local capacity to revise and adapt resources.

Questions for Consideration

- Are the instructional materials realistic for the conditions in which teachers work?
- When are teachers engaged in the development process and how do their insights shape the design?
- Do your materials model effective pedagogy, explain instructional choices, and help build teacher understanding?

Tech Strategies and Tools Should Serve a Clear Instructional Purpose

4

and Align with Real Classroom Conditions

Programs need a clear, context-specific vision for how technology will support teaching and learning that is grounded in instructional needs and is responsive to local classroom realities. This requires considering infrastructure constraints, teacher comfort with technology, and existing instructional practices. Strong tech integration addresses logistical feasibility and instructional alignment, ensuring tools have a clear instructional purpose and are both relevant and adaptable to local needs.

In Practice

In Rwanda, coding activities were more widely adopted and better aligned with available resources than robotics. Teachers were able to implement coding lessons, such as those using Scratch, Turtle Art, and Etoys, using existing XO laptops. Many students explored the tools enthusiastically. Teachers described how these coding lessons helped students build problem-solving skills and created connections to mathematical content and real-life experiences. By contrast, robotics activities proved harder to implement. Although robotics was also based on Scratch, teachers faced barriers such as slow or incompatible laptops, limited materials, fragile kits, and insufficient time for hands-on practice. While robotics was seen as engaging and aligned with long-term learning goals, its success was limited by infrastructure gaps and insufficient scaffolding.

Questions for Consideration

- How are you ensuring that technology integration plans are realistic for teachers and students in your context?
- What information have you gathered about teachers' digital literacy strengths and needs, and how are you using this information to design and differentiate training and support?
- How are you planning for long-term integration and sustainability of tech strategies?

IMPLICATIONS

for Program Design and Implementation

- Design tech integration plans that are grounded in real classroom conditions, considering infrastructure, teachers' digital literacy, and access to devices compatible with the software for planned activities.
- Scaffold the tech integration process by starting with low-tech or familiar tools that teachers can use confidently, then gradually introducing more complex tools alongside training and support.
- Ensure tech tools are infused into lessons for a clear instructional purpose that goes beyond student engagement.

Pilot, Learn, and Adapt

Before Scaling

5

Piloting is an essential step in developing effective programs. It allows teams to identify challenges, gather feedback, and make evidence-informed adjustments early in implementation. Programs should prioritize regular cycles of reflection and adaptation in close partnership with research teams before expanding to additional schools or regions. This iterative approach supports meaningful improvements and helps address barriers early. Embedding continuous improvement into the program model leads to stronger implementation that builds on what works and cultivates a learning mindset.

In Practice

While piloting and iteration are essential to designing effective programs, in practice, implementing this approach can be difficult in countries that require formal approval before classroom use. In Kenya, the KPLAY team adopted a continuous improvement approach midway through the project, following the arrival of a new program director. Data-driven "learning sprints" were introduced in partnership with their evaluation team to test and refine less successful program components. One area of focus was improving Communities of Practice (COPs), which initially struggled with low engagement. Through structured work plans, peer learning activities, and asynchronous engagement between meetings, all participating schools built active COPs that supported ongoing teacher learning.

IMPLICATIONS

for Program Design and Implementation

- When formal approval processes limit flexibility with student-facing materials, focus testing on areas with more room to adapt, such as teacher professional development.
- Engage government partners early to explore where flexibility for iteration may be possible.
- Even when large-scale piloting is not possible, schedule regular opportunities to review data and make mid-course corrections.

Questions for Consideration

- What risks might you face if you scale a program without first testing how it works in real classrooms? How can early piloting smooth implementation?
- Are there lower-stakes environments such as after school programs or professional development programs where new ideas can be tested and refined?
- How can you foster a mindset of adaptation and learning among implementers working within approval-heavy systems?

Build System-Level Capacity

to Support Teachers' Transition to New Instructional Model

6

Teachers are more likely to adopt and sustain new practices when supported by a strong system around them. Implementation partners should invest in the people and structures that support classroom practice, such as leadership training, school-based coaching, and communities of practice. Building system-level capacity also requires that those who support teachers—such as trainers, coaches, and mid-level administrators—receive adequate preparation themselves. Training for trainers and school and regional leaders is essential to promote consistent messaging and effective follow-up. Programs also need to consider how their approach aligns with national policies, ensuring coherence across the system.

In Practice

In Brazil, the Creative Schools Program worked in coordination with Secretariats of Education to embed creative learning into existing structures, building greater coherence and potential for sustainability. The program trained school-based coaches to support teachers in planning and adapting creative learning lessons. The program also leveraged existing structures of the school system, such as shared teacher planning time every Friday, which some Secretariats used to facilitate collaboration among creative learning teachers. It also partnered with the Secretariats' professional development staff to develop localized training programs. These coordinated efforts helped teachers experience creative learning as part of the broader instructional vision and routines of the system, rather than as a separate or temporary initiative.

IMPLICATIONS

for Program Design and Implementation

- Leverage existing system structures, such as school-based coaches and teacher planning time, to embed support for instructional change that can be sustained beyond the project.
- Partner with system leaders to align program goals with national priorities and policies.
- Empower school and other system leaders to act as instructional leaders by providing training and tools that help them understand pedagogical shifts and support implementation.

Questions for Consideration

- What existing structures in the system can be leveraged to support teacher learning and implementation?
- How are you supporting school and system leaders to act as instructional leaders who can champion and sustain new practices?
- What is your plan to ensure instructional support continues beyond the life of the program?

Strengthen Program Design through Collaborative Learning

that Leverages Expertise in Content, Pedagogy, and Context

7

Developing effective, innovative pedagogy new to the context requires collaboration among stakeholders who bring complementary strengths. A design process that fosters collaborative learning—bridging expertise in content, educational practice, and local context—leads to more creative, context-appropriate solutions. Giving local stakeholders meaningful roles enhances the design process while strengthening ownership, buy-in, and long-term commitment.

In Practice

In Kenya, the design of early materials was led by international content experts, with local staff and teachers providing feedback after the fact. Initially, the program emphasized high-tech tools and imported creative materials for tinkering, like Makey Makey kits, felt, sticker paper, and robotics components. Through dialogue with teachers and local education staff, the program gradually shifted toward using simple, locally available materials that connected to the curricular goals, such as stones for counting and alphabet cards. Program goals also evolved to focus on foundational literacy and numeracy, reflecting that these skills were the most urgent local priority. As local staff took a larger role in design, materials and strategies became more closely aligned with classroom realities. This shift improved the relevance of the program and strengthened ownership among teachers, making the program more sustainable over time.

Questions for Consideration

- Whose voices are shaping the design of your program, and at what stage are they involved?
- How are you drawing on different forms of expertise such as pedagogy, subject knowledge, and local knowledge in your design process?
- What structures are in place to support collaborative learning and reflection to help the program continue to evolve in response to local needs and conditions?
- Are local experts meaningfully shaping design decisions, or only being consulted after decisions have been made?

IMPLICATIONS

for Program Design and Implementation

- Bring together a design team that includes the right mix of expertise in content, pedagogy, and local context to ensure the program is both effective and relevant in practice.
- Foster shared learning among content, pedagogy, and context experts by creating opportunities for joint reflection, discussion, and co-creation across all stages of the design process.
- Align design efforts with local priorities and capacities to improve relevance, ownership, and long-term sustainability.

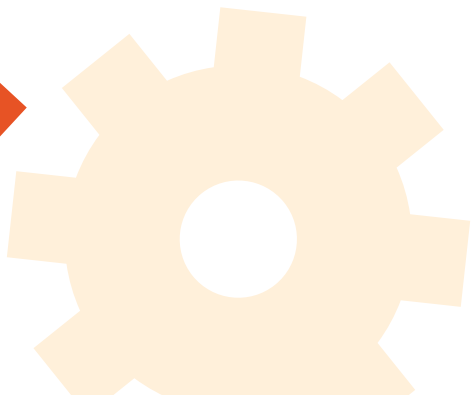
Conclusion

The lessons from the Tech & Play initiative offer an important reminder

that meaningful instructional change takes time, intentional design, and deep collaboration. Across Brazil, Kenya, and Rwanda, implementing partners have demonstrated that teachers can shift their practice to more student-centered, active learning approaches with the right conditions: professional development that meets teachers where they are, instructional materials that model effective practice and reflect classroom realities, and technology tools that have a clear instructional purpose.

Implementing partners play a key role in creating the conditions for instructional improvement. Programs were most successful when they evolved in response to continuous feedback and adaptation.

We hope you will use the lessons in this brief to reflect with your teams and refine your supports in response to teacher and learner needs.



Citations

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