SUMMARY REPORT

# Learning Through Play and the Development of Holistic Skills Across Childhood

The LEGO Foundation

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The LEGO Foundation

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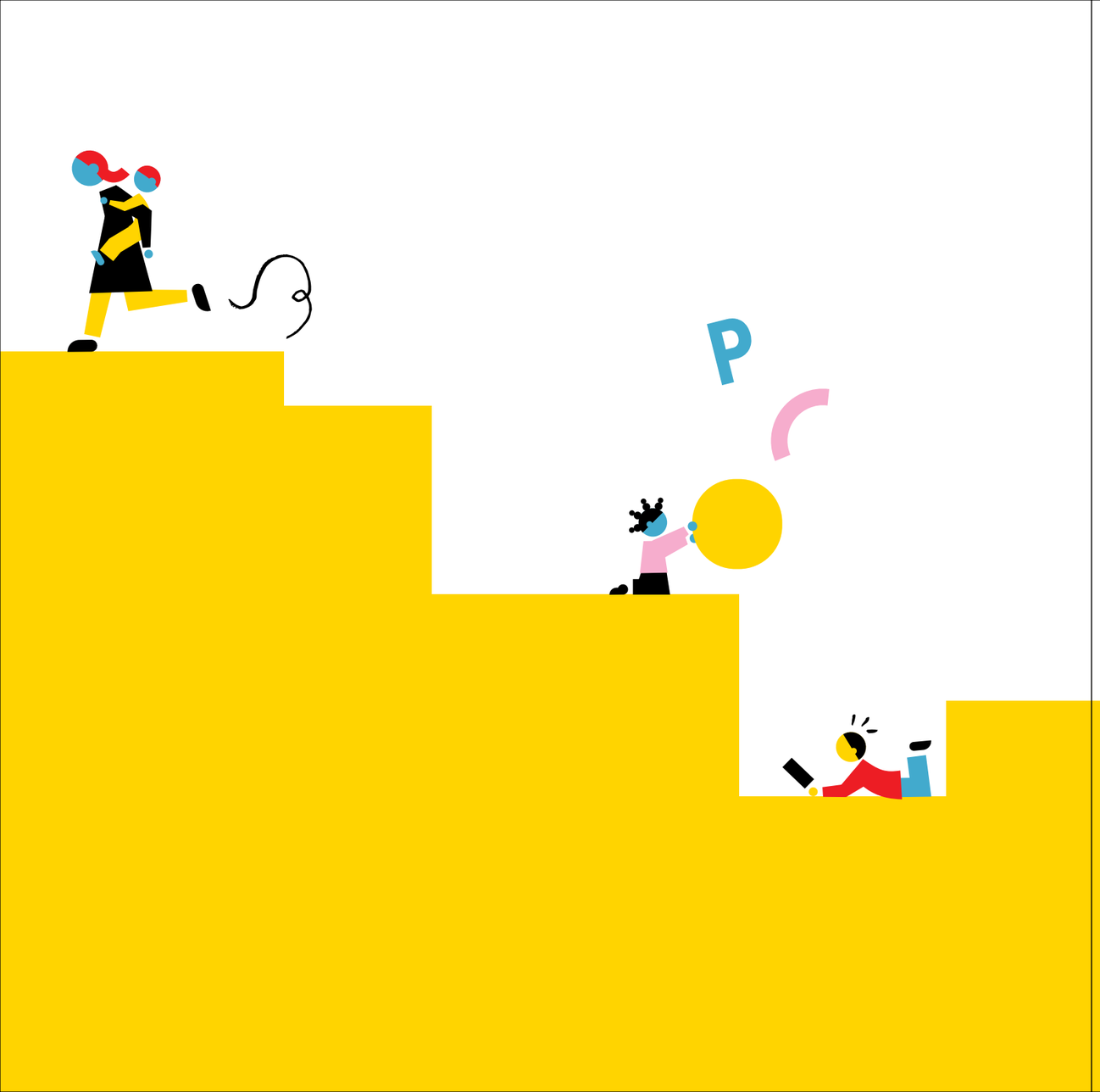

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# Introduction: the broader context of learning through play

The LEGO Foundation's mission is to empower children to become creative, engaged, lifelong learners and to develop the holistic skills that will serve them, their communities and society throughout their lifetimes.

Previous LEGO Foundation research reports have shown the effectiveness of children learning through play for holistic development. There is a growing body of evidence (see for example *Play and Children's Development*, LEGO Foundation 2012/17) that playful learning enables children to gain a wide range of skills and subject knowledge, and helps them to thrive as individuals and contribute positively to the communities in which they live.

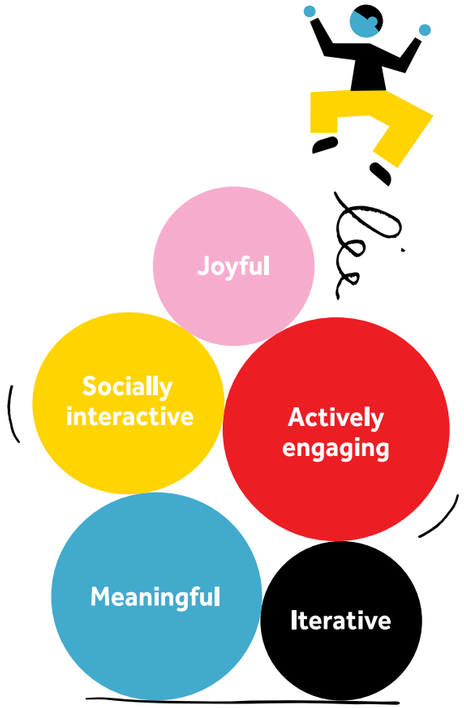


The LEGO Foundation has worked with research partners to review the learning sciences and identify five key characteristics of deep, effective learning experiences, which are present when children learn through play. For children, these experiences:

- → are **joyful**, holding space for authentic exploration, surprise and discovery
- → are **meaningful**, rooted in the familiar environments and situations that children care about
- → involve **active, engaged**, 'minds-on' thinking
- → are **iterative**, meaning that children are able to try things out, take them apart and try again
- → involve meaningful **social** interactions with others

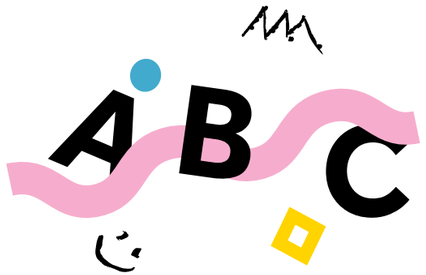
When children's play demonstrates these characteristics and is paired purposefully with a learning goal, deep and long-lasting learning can be the result – learning that stays with children in the form of skills and knowledge they can apply now and across their lifetimes to diverse, real-life situations.

Parents and educators can support this kind of learning by taking a responsive, facilitative approach to children's learning. In other words, rather than teaching them directly, adults can offer opportunities for children to explore and discover things for themselves, and even participate in play to learn together with and from their children. LEGO Foundation research has explored the importance of children's agency in the learning process. We think of learning through play as taking place along a spectrum of facilitation techniques, with varying levels of adult support and direction in response to children's learning needs.



# Where this new report fits in: the focus on holistic skills

This report contributes to the LEGO Foundation's wider body of research on learning through play through its focus on holistic skills.






## What do we mean by holistic skills?

Previous LEGO Foundation research has established five main holistic skills that children practice when they learn through play:

- → **Cognitive skills:** the cognitive domain goes beyond traditional academic content and skills, such as numeracy and literacy. It also includes children's ability to sustain attention, think critically, solve problems, make decisions, reason using evidence, and evaluate what they know and do not know (metacognition).
- → **Social skills:** these include collaborating, communicating and understanding other people's perspectives through sharing ideas, negotiating rules and building empathy.
- → **Emotional skills:** these include understanding, managing and expressing emotions by building self-awareness and handling impulses, as well as staying motivated and confident in the face of difficulties.
- → **Physical skills:** these are about more than being physically active; they include understanding movement and space through practising sensory-motor skills, developing spatial understanding, becoming physically confident with their whole body and with more focused (fine motor) movements, and nurturing an active and healthy body.
- → **Creative skills:** these can include coming up with new ideas (including 'divergent thinking', in which more than one possible solution to a problem is put forward), prioritizing the most meaningful or relevant ideas to transform into reality, expressing ideas and creating associations, and symbolising and representing ideas.

This report also looks at a number of sub-skills within these areas, which range from basic to complex, and which children develop as they grow. The development of holistic skills is also interdependent – both within and across different holistic skills. In other words, it's more like weaving a rope than stacking blocks. Certain sub-skills depend on others: even an apparently simple task can involve a number of holistic skills and sub-skills intertwining and working together in subtle ways. Children weave together these skills in complex and interconnected ways by exploring and responding to meaningful, real-world situations, like they do in play. They do this in their schools, neighbourhoods, homes, playgrounds, communities and in the digital world.

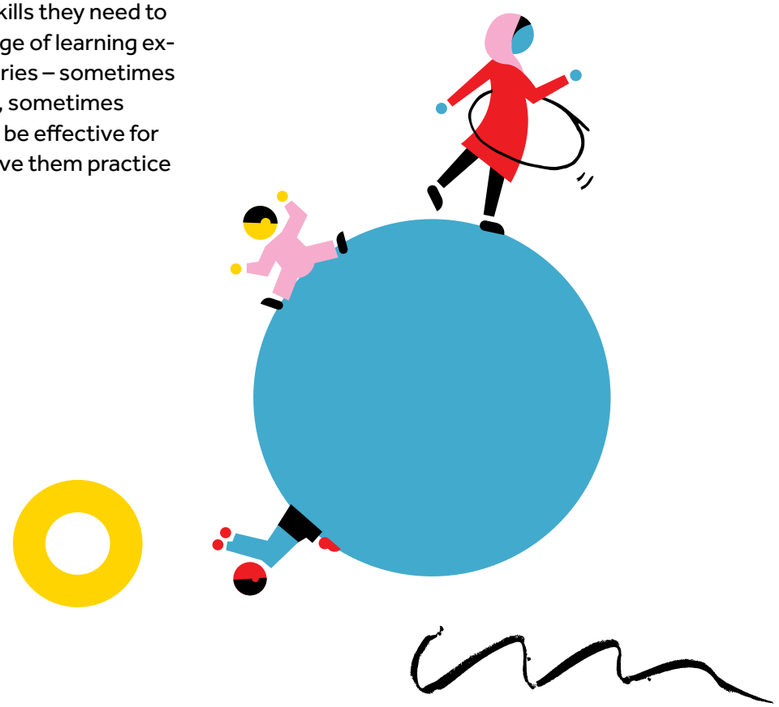
## How learning through play could contribute to the development of holistic skills

While we don't have a strong body of causal evidence yet, we can use what we know from the learning sciences and child development to speculate about ways that learning through play may contribute to the development of holistic skills.

For example, we know that children learn in diverse ways. Sometimes direct instruction is useful for learning, but children also need to have choices and approaches that allow them to be more hands-on and engaged: they need to ask questions, and test



out different ideas. They need to work with others to trouble-shoot and problem-solve. These more child-centred approaches, in which the child is an active agent, are what lead to deeper learning. When children are active participants in their own learning, interact with others, have opportunities to work through trial and error, have 'a-ha moments', and are able to relate their learning to their own lived experience, they can practice a range of skills they need to succeed in the world. Offering a range of learning experiences, in which the adult role varies – sometimes more adult-led through guided play, sometimes more child-led – has been shown to be effective for children's learning, and is likely to give them practice honing a breadth of key skills.



# How skills play out in real life

Consider Stella, a toddler who is learning to walk. Stella must develop the gross motor skill of locomotion, and she must develop the necessary muscle strength in her torso and her legs. She must learn to move her legs in an alternating pattern. She must use depth perception to navigate changes in terrain. She must process the emotional challenge of being separated from her caregiver. She must also process her own emotions – fear and excitement – as she takes this new step, and she must develop the self-confidence even to attempt it. She has to develop the metacognitive skills to know when she will be able to successfully navigate an obstacle and when she will not (for example, walking down a steep hill).

Meanwhile Angharad, aged 11, is excited as she prepares for the annual science challenge. She must manage these feelings of excitement because she knows that she needs to be thinking clearly as the science games begin. As she works with her teammates, she must follow the social expectations of the school while also balancing her social relationships with her teammates. She must regulate herself because she knows that she tends to take over when she gets excited, and a teacher will disqualify anyone that does not work well in teams. She must think adaptively as she is presented with a new scientific concept she has never heard of before. She must practice her fine motor skills as she works to measure closely and write down her data. She must use critical thinking as she evaluates the evidence coming in.

As the above examples illustrate, **even in a single activity, we draw on a whole range of skills and sub-skills. Skills like these are not taught; children practice them and weave them together themselves when they work on complex tasks like walking or competing in a science competition. Learning through play gives them lots of opportunities to do this.** The exact shape that learning through play takes, in different settings and geographies, is bound to vary. Learning through play happens all across the world, in many different environments. But in different countries, different cultural contexts influence the types of learning through play that takes place.

# What did we do in this report?

This report set out to show what evidence there is for the connection between learning through play and holistic skills, in children aged up to 12 years, and across different settings (including homes, schools, communities, and other formal and informal settings), and different cultural contexts and geographies.

To do this, we reviewed more than 300 empirical studies that show a positive link between learning through play and children's holistic skills, from 49 countries around the world. By synthesising these pieces of published research, the review identified where there is more and less evidence supporting a positive link between learning through play and children's skills and sub-skills.

The review concentrates on the sub-skills for which there is the most research evidence showing a positive link with play, and gives specific examples of how learning through play can help children develop holistic skills and sub-skills. It also shows where gaps remain in our understanding of this subject, and suggests next steps in research in this area.

# Findings – general

The review identified 323 studies from around the world supporting a link between learning through play children's holistic skills in all five main areas: cognitive, social, emotional, physical and creative skills.

The highest number of studies focused on a link between learning through play and cognitive skills.. This may be because of the attention that has been paid to cognitive skills in education systems and academics across the globe, as well as the availability of measures to capture these skills.

Most of the research that has been published also concentrates on learning through play in pre-school settings and with children between 3 and 5 years old. There is also much less evidence from low- and middle-income contexts, and there is generally very little diversity in children's race and culture, with a strong bias towards WEIRD (Western, Educated, Industrialized, Rich, and Democratic) contexts.

There is a marked lack of research showing positive links between learning through play and more than one holistic skill or sub-skill together: most of these positive associations were between playful learning and a single holistic skill, or only a few holistic skills and sub-skills together. This does not reflect the holistic interconnection of these skills that we know occurs as children develop.



# Findings – by main areas of holistic skills

Cognitive skills

Social skills

Emotional skills

Physical skills

Creative skills

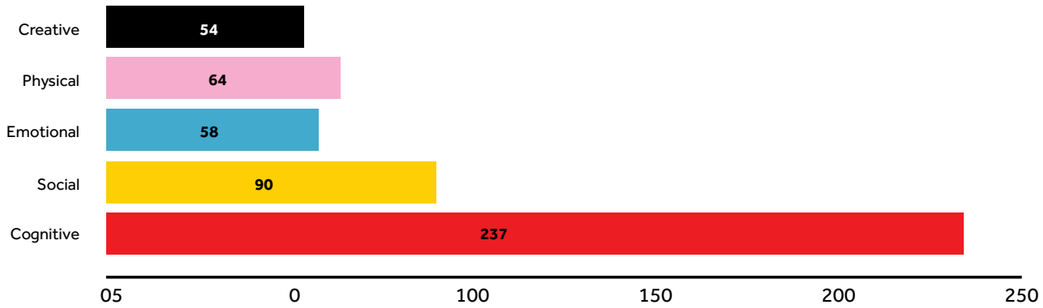



*Figure 1: Number of instances where a study found positive links between learning through play and the five key holistic skills.*

## Cognitive skills

Overwhelmingly the available studies exploring learning through play and skills focus on cognitive skills (see Figure 1). The majority of positive evidence also comes from the preschool age range.

The evidence base includes 237 examples that support a link between learning through play and a wide variety of cognitive sub-skills. The four sub-skills that have the most evidence of a positive relation with learning through play are:

- → literacy
- → mathematics (especially as it is supported through block play)
- → executive functions (which include the ability to pay attention and control one's thoughts)
- → spatial knowledge (including understanding of shapes, for example)

Other cognitive sub-skills that were linked to playful learning across fewer studies include: critical thinking; reasoning; scientific thinking (with play allowing children to form hypotheses about what will happen under certain circumstances, and to test those hypotheses); and metacognition (with play enabling children to explore what they know and do not know).



## Social skills

In the 90 studies reviewed here of social skills, there is the greatest amount of evidence linking learning through play to:

- → pro-social skills (the everyday skills that help children to interact effectively with others)
- → social engagement

Some studies argue that play is uniquely beneficial in helping children to develop social skills, linking it to children's social competence and school-readiness. Other social skills that are linked to learning through play in these studies include: the management of emotions and behaviours; theory of mind (being able to understand what other people are thinking and feeling); co-operation and collaboration communication (with play helping children to negotiate with others); social and community values (the spoken and unspoken rules and standards within a community, which of course vary greatly between geographies and cultures); and empathy.

## Emotional skills

The review found 58 studies in which there was a positive link between learning through play and emotional development. In particular, evidence suggests that learning through play is related to:

- → children's feelings of positive emotions, like their experience of joy in relation to learning

Other sub-skills that were linked to playful learning include: self-regulation and self-control (with play enabling children to learn how to deal with frustration and disappointment); self-efficacy (the feeling that one is competent and in control); coping and resilience; self-esteem; self-awareness; and persistence.

## Physical skills

The review found 64 studies showing a positive link between learning through play and the development of physical skills. In particular, a number of studies were concerned with ways of increasing physical activity in children. Games have also been repeatedly linked to children's gross motor skill development.

There is also some evidence, although not as much, that learning through play is related to children's fine motor skills. Other physical sub-skills found in the review include: spatial awareness; physical fitness skills; and skills relating to physiological health.

## Creative skills

Some studies have examined the relationship between play and creative skills. The review found 54 pieces of published research that show a positive link between learning through play and creativity.

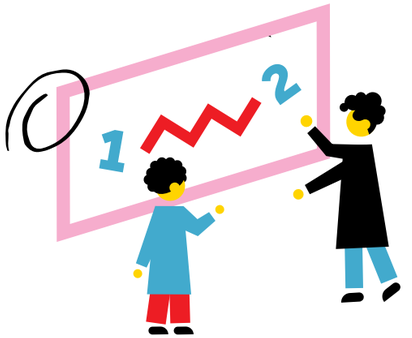
In particular, make-believe play is shown to be a potential pathway to the development of creative skills. The review revealed studies linking playful learning to creative sub-skills, including: divergent thinking (being able to come up with more than one possible solution to a problem); curiosity; and creativity in movement (such as play that involves developing a new dance routine).

# Conclusion and recommendations

This review found a surprisingly high number of studies showing a positive link between learning through play and children's skills. This relationship should be investigated more thoroughly to help inform decision-making for parents, teachers and policymakers. It is easy to imagine plausible mechanisms for a causal relationship, in which learning through play provides opportunities for children to practice and hone a wide range of skills, and these mechanisms need to be studied closely so caregivers and decision makers can do their best to support whole child development.

Studying these mechanisms is an effort that will require culturally sensitive measurement tools to measure play and skills, and well-designed longitudinal studies that follow children beyond the early years and into school age.

Future research should also investigate more closely how the role of the adult in play helps to develop skills. This review found that guided play, where a child was supported but not directed by an adult, was repeatedly linked to holistic skills outcomes. If future research supports this link, we need to make sure that this understanding of the potential of guided play reaches those who implement learning through play and support children's holistic development. In homes, this means encouraging caregivers to get involved in children's play and embed opportunities for learning. For teachers, it means shifting from the belief that free play is the only form of play, and appreciating that learning goals and play can co-exist. There is a need to recognise and support learning through play in other informal learning settings too, such as community settings, and in the digital world (Murray, 2021). This is especially important as the COVID-19 pandemic continues, and children's access to formal learning spaces continues to be affected.




Given the importance of holistic skills both now and in the future, and the promising evidence linking learning through play to children's skills, we need to re-imagine the kinds of learning opportunities we offer to children as they grow, so that they can weave their academic and holistic skills together as they develop.

This review may not provide every answer we need to make the best decisions for children yet; however, it does offer consistent evidence that **playful learning and children's skills go hand-in-hand. We do not see this important relationship reflected in mainstream education systems.** Changing systems to better reflect this will require more than just evidence; it will require a shift in the perspectives of policymakers, parents and teachers, who often prioritise cognitive and academic learning. This will take a collaborative effort on the part of all stakeholders in children's learning and education to re-imagine what learning can and should look like today and in the future.

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