

White paper

Play facilitation: the science behind the art of engaging young children



**Hanne Jensen, Angela Pyle, Jennifer M. Zosh, Hasina B. Ebrahim,
Alejandra Zaragoza Scherman, Jyrki Reunamo and Bridget K. Hamre**

February 2019

ISBN: 978-87-999589-5-5

The LEGO Foundation

Table of contents

Playful practices: building on how children naturally learn • 4

Bringing skills and knowledge into play • 6

Introducing a spectrum of practices • 10

Combining practices across the spectrum • 18

Realising play facilitation in practice • 22

Research gaps and future directions • 28

About this white paper • 32

References • 36

Suggested citation

Jensen, H., Pyle, A., Zosh, J. M., Ebrahim, H. B., Zaragoza Scherman, A., Reunamo, J., & Hamre, B. K. (2019). Play facilitation: the science behind the art of engaging young children (white paper). The LEGO Foundation, DK.

This white paper is published in 2019 and licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International (CC BY-NC-SA 4.0) Unported License.

ISBN: 978-87-999589-5-5



Becoming a play facilitator takes practice and courage. Practitioners need to understand the importance of play in young children's development, to feel empowered to lead sessions that focus on process, and to have concrete examples that model activities and scenarios; rather than recipes, these examples should provide a springboard for them to iterate and innovate. The combined professional judgment, skill and confidence, which this kind of support inspires, hold the key to success in practice.

**Kim Foulds,
Sesame Workshop**

Playful practices: building on how children naturally learn

Play is full of learning opportunities

Today's children are tomorrow's leaders, inventors, scientists, artists, caregivers and educators. That child playing with blocks on the floor with bits of lunch still on her face may be the child who later cures cancer, builds a solar panel that provides energy for her community, or educates a whole classroom full of children who are the next-next generation of innovators. The question is how we can create learning environments that empower young children to realise their potential. In its many forms, play is full of learning opportunities. A child scaling a climbing frame or running through a field is developing physical skills and the ability to assess risk. Children playing family are learning to socially negotiate and self-regulate. When playing in an imaginary store, children use mathematical abilities and oral language skills, and word games are a chance to practice their literacy skills.

Research into children's learning through play is gaining traction, contributing new and much-needed insights from laboratory studies, cross-cultural and longitudinal work. Studies find that children with ample occasions to engage in child-directed activities, including free play with peers, also demonstrate greater self-control.¹ When it comes to learning specific academic content, for example what a triangle is, laboratory studies find that young children gain a more robust understanding from adult-facilitated play than from direct instruction or from free play with cut-out shapes.² This finding is consistent with previous meta-analyses of more than 160 studies on what makes for effective practices.³ While playful experiences offer great learning opportunities, this is clearly only part of the story. Children need high-quality interactions with peers and adults for this learning to take place.



Playful moments naturally harness characteristics that propel children's learning: being active and minds-on, finding meaning and joy in an experience, trying out ideas and interacting with others.





The hallmarks of a play facilitator

Play facilitation is the science and art of fuelling children's engaged learning in play. A good facilitator inspires play, creates space and time for many kinds of playful activities, and adapts his or her role to match where children are as they take on new challenges. Skilful facilitators are able to spot opportunities to integrate learning goals in playful settings without disrupting children's engaged and playful endeavours. But the reality is that adults often struggle with this balancing act and feel unsure about their role and how to support children's learning outcomes in playful settings.

In play, educators often end up switching between instructing directly and stepping into the background. That is why equipping educators and caregivers with the knowledge and skills necessary to foster children's playful learning is needed.

Distilling insights from research

This white paper describes why engaging young children in a range of playful practices is worthwhile and how it can be done. Starting from the demands of today's changing world, we first consider how young children can learn a breadth of skills and gain a deeper understanding through a spectrum of practices – free play, guided play, games and direct instruction. We present emerging evidence that playful practices can support a variety of learning outcomes, and for this to happen, educators and caregivers are essential – they have a critical role in facilitating young children's learning through play.

The paper offers a research-informed overview of play facilitation as a topic for professionals, programme developers and researchers working with children aged three to six in early learning settings. While it is possible to link child outcomes with different practices, comparing these same practices on the basis of their effects for different outcomes is still a challenge. Towards the end of the white paper, we call for further research on play facilitation and make recommendations for future efforts.

Bringing skills and knowledge into play

Learning in a changing world

Today, anyone with internet access can look up immeasurable amounts of information in a few clicks. This represents a shifting landscape – both for today’s children, and the demands they will face as adults, and for the education systems that seek to prepare them for tomorrow. In response, governments and international organisations alike propose frameworks that integrate the skills, knowledge and dispositions needed.^{4,5} Such newer takes remind us that learning today is about learning for a life of constant change. We can also notice a consensus – that children need a deep, conceptual understanding of content knowledge together with skills that enable them to apply what they know. Researchers Golinkoff and Hirsh-Pasek⁶ have offered the 6Cs as one concise model – that children are able to communicate ideas, collaborate with others, creatively innovate new solutions, critically think and evaluate data, have the confidence to try new things and be willing to fail, and, importantly, have the content knowledge as a foundation.



Play gives children opportunity – to develop skills, to learn, to solve problems and grow healthy relationships. If they are physically active during play, it also brings health benefits. Widening access to play, particularly early in life, is one way of reducing the differences in life chances that we see in society.

**Paul Ramchandani, the PEDAL Centre
at the University of Cambridge**

Children have what it takes

Research tells us that early childhood is crucial in setting children up for thriving as adults.⁷ Further, that academic outcomes, including literacy and numeracy, ultimately rely on many other skills across domains of children’s development. Even from a young age, children can practice a breadth of skills. At the age of three, young children show instances of regulating their thinking, feelings and behaviour; they can stay focused during play, engage with peers, remember events, care for others and learn to wait for their turn.⁸ From the age of three to six, children can learn to carry out multi-step activities, resist distractions and choose tasks suited to their interests and skill level, just as they can learn to use more advanced problem-solving strategies. These are all skills that underpin our capacity for learning, including academic skills,¹⁰ and benefit future adult outcomes.^{11,12}

Playful and effective practices

If you take a moment to notice how young children play, they seem to repeat their actions. Look closer, and you’ll see that they are in fact testing, experimenting and adjusting their attempts. Playful experiences offer a safe space for children to try out and take risks, where they feel a sense of agency and direct their own activities. For example, four and five-year-olds building structures together in pairs achieved more complex structures than when the same activity was directed by an adult.¹³ Children also tend to discuss detailed features during playful building activities with peers¹⁴ and demonstrate higher levels of self-regulation during small-group activities and play.¹⁵ Given insights like these, the potential of play to enhance young children’s learning becomes central to the debate on effective practices.

Early science and shape knowledge

Research into facilitating learning in academic subject areas such as science, maths and literacy through play have communicated the types of play that are most effective for the development of these skills. As an example, Doherty (2012)¹⁶ explored the relevance of free, child-directed play for promoting science learning. However, the children's lack of focus and resulting lack of completion of the activities led to minimal learning. When adults entered the play, creating a mutually-directed play context, children's learning improved. The ability to develop scientific reasoning skills through guided play has been echoed in other research findings.¹⁷

Similar results are found in the area of spatial thinking. For instance, Fisher and colleagues (2013)² compared free play, guided play and direct instruction as contexts for supporting children's development of shape knowledge. Their findings demonstrate that free play provided little novel learning, adult instruction allowed for some learning, and guided play had the most significant effect on children's learning of the targeted academic skills.

Number sense and early numeracy

It may be surprising to think that we are born with a sense of numbers. Studies show that infants can detect changes in large groups of items (e.g., 6-month-old infants can detect a change in a display when the number of items doubled, for instance; eight changing to sixteen)²⁵ and are able to accurately track 1, 2 or 3 items.²⁶

Even with this initial number sense, it takes practice to develop numeracy skills. With support from caregivers and through playful explorations, three-year-olds can learn to compare amount and size, recognise patterns, and solve everyday problems involving the measurement and numbers of objects; they can reason about more and less, count, and find ways to share things equally among peers.²⁷ Around the time when children reach school age, most can learn to compare sets of objects, and do simple additions and subtractions.²⁸

Another surprise may be that numeracy is not only about numbers: it also relies on self-regulation, or executive functions (EFs), and spatial skills. In a study with 44 three-year-olds, researchers found that children's spatial skills and EFs together accounted for 70% of the difference in their early mathematical abilities.²⁹ Given that EFs underpin our goal-directed behaviour,³⁰ perhaps this is not too surprising after all. Spatial skills allow us to imagine objects in our minds and rotate or manipulate them, and to navigate spaces. Children can practice these skills through playful activities, including block building, puzzle games and playing with materials of all kinds of shapes and sizes, and benefit from adults joining and supporting their play.^{31,32}

Adults have important roles in play

The area of literacy development in play has been somewhat less consistent in its recommendations. Prior research has demonstrated the benefits of free, child-directed play contexts for the development of literacy skills, particularly when the play environment was thoughtfully designed by adults to include literacy materials such as books and writing materials.¹⁸ More recent research has further explored the connection between play and the learning of literacy skills. These studies find that surrounding children with literacy-rich materials in play contexts is not enough to foster robust literacy learning. However, when adults engage children in literacy learning during play, and in a manner that extends rather than interrupts the flow of the play, we do see benefits.¹⁹

In its essence, learning is about progressing from more simple tasks and concepts to more complex challenges and grasping the bigger picture. This comes out in emergent literacy (knowing names and sounds of letters to expressing thoughts and ideas in writing) and in numeracy (from an initial number sense to recognising features that define shapes and using measurement to solve real-world problems). Our ability to navigate social situations progresses in similar ways – from observing what others do and responding to how they feel to gradually participating and asserting own wants, even sharing, comforting and helping others. For young children to progress, early learning practices need to meet them where they are and challenge them to go further. No single practice is likely to meet this demand. However, a spectrum of engaging practices can.

Language and emergent literacy

Literacy is not a simple feat. Indeed, recent estimates suggest that 17% of adults in the world are illiterate.²⁰ The path to literacy consists of several steps and building blocks, many of which are developed during the early childhood period.²¹ The Eunice Kennedy Shriver National Institute of Child Health and Human Development (2010)²² suggests “Conventional reading and writing skills that are developed in the years from birth to age 5 have a clear and consistently strong relationship with later conventional literacy skills.” They identify 6 key abilities that relate to and can predict later literacy. These include: alphabet knowledge (knowing the names of letters and their related sounds), phonological awareness (the ability to break words into component measures of sounds), rapid automatic naming of letters and digits as well as of objects and colours, writing letters or writing one’s own name, and phonological memory (short-term memory for spoken words).

These foundational skills do not magically come with each birthday for young children. Instead, parents and caregivers play important roles in exposing children to language (both verbal and written) and the quality of both verbal and non-verbal parent–child interactions has been shown to be a potent predictor of later language.²³

Despite literacy being serious business, it can be learned in playful ways. For example, Cavanaugh and colleagues (2017)²⁴ compared the benefits of prescribed activities and children’s self-invented games for promoting literacy skills. In both cases, small groups of five-year-olds were given hands-on materials to practice phonemic awareness and letter-sounds for fifteen minutes. One group practiced in a prescribed activity. The other group tried this same activity once, before inventing their own games with the hands-on materials. After only three weeks, the children in the games group had improved significantly more than their peers.

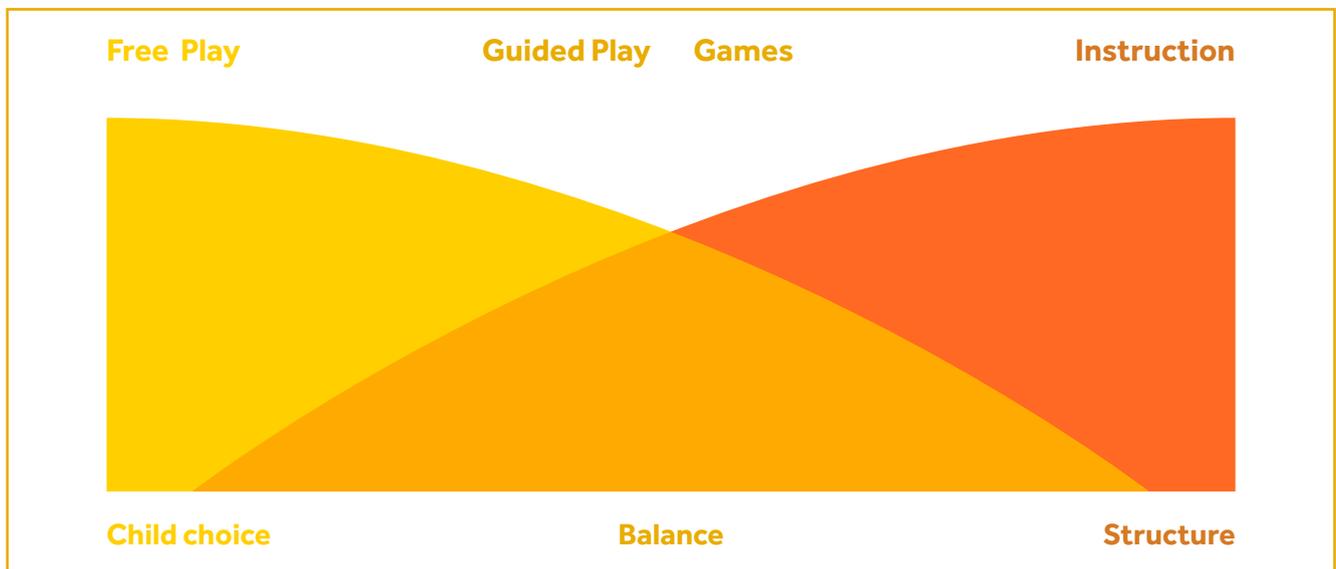
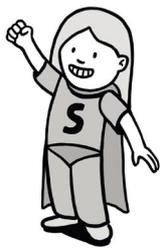


Introducing a spectrum of practices

There are many ways to play, each with different roles for adults and children, and each posing different demands on the players. The dynamic nature of play has led to some friction in the field. There are researchers who maintain free play as the “gold standard” and argue that adults’ roles should be limited or non-existent. Others view guided play, in which adults hold a supportive role, also as play. Zosh and colleagues (2018)³³ propose that this friction is keeping the field from developing a more nuanced notion of play that encompasses its dynamic and changing nature. Instead, they suggest that play should be viewed as a spectrum rather than a static concept. Interestingly, we begin to see this trend emerging from classroom research with young children.^{34,35}

For young children to progress, educators need to start where they are and challenge them to go further. No single practice can do this, but a spectrum of engaging practices can.

In the next pages, we describe this spectrum of play practices together with evidence illustrating how each promotes children’s learning and development. We have made an effort to choose studies with children aged three to six, specifically. Based on the literature, our point is that each practice can have a role in the lives of children, teaching them and helping them to thrive and to become the change makers of tomorrow. By being more specific about these different ways to play and learn, and affordances of each kind of practice, educators and caregivers can make informed choices about how to incorporate play into their practice, knowing that this play isn’t just fun and games. It is learning at its best.



Learning through direct instruction

When concepts are new or very complex to young children, high-quality instruction is especially important for their learning.

When emphasising how playful practices can offer effective and engaging learning contexts for young children, our point is not that play is the only way to learn. Young children also learn from observing others and from instruction. Equally, moments of explaining and telling children how to do something specific form an integral part of practice. Like play, direct instruction can take different forms.

In traditional notions of instruction and teaching, the adult is the 'font of knowledge' and responsible for 'depositing' information in children's minds. This represents an extreme version, where the adult both initiates and directs the learning activity, and children then follow. This one-way approach devalues the voice and agency young children bring to the learning encounter and can lead to rote-learning and memorisation without understanding.⁶²

In their review, Lee and Anderson (2013)⁶³ apply a critical lens to decades of experimental research comparing discovery-based learning and instructional practices for applied problem-solving in science and mathematics. It is important to note that studies in this review featured third-grade students and above from Western cultural settings, but even with these limitations, their conclusions are worth bearing in mind. The two authors found minimal evidence that verbal instruction on its own was effective; however, substantial evidence showed that explaining with concrete examples does help. In worked examples, learners are presented with a problem statement, step-by-step solutions and a final answer. The key to this instructional practice is that learners are actively engaged. For example, while modelling an example or new skill, educators share their thoughts and decisions, guide exploratory discussions where children share and justify ideas,⁶⁴ or encourage active participation through feedback.⁶⁵ Such guidance helps learners to focus their attention on important features or details in an activity. When concepts are new or very complex to young children, research suggests that this kind of high-quality direct instruction is especially important.^{66,67}

Key features of direct instruction

- Adult initiates and directs
- Child follows
- More structure and less choice

The adult sets goal(s) attuned to children's learning needs and interests. The adult scaffolds children's attempts through explicit instruction; children are actively engaged during the activity.



Adult roles

Prepare environment and materials in line with learning goal.

Guide and scaffold children's attempts, explain, observe their efforts and support when they struggle to master the intended learning goal or skill.

Child benefits

Well-planned and intentional instruction with use of effective techniques can lead to improved academic outcomes and socio-emotional skills.

Learning through free play

Free, unstructured play is centred around the child. Picture a group of peers on a playground, deciding amongst themselves that the swing set is base and that a game of tag will begin when the bell tolls. Or imagine children who go into their childcare classroom and are given the freedom to do whatever their heart desires. In this play, adults ensure that children have time, space and materials for immersive and inclusive experiences. In this kind of self-governed play, children are often intensely active, both physically and mentally.³⁶ The fact that young children exercise the most autonomy of all practices listed here speaks to important learning opportunities. As they exert control and direct their own learning, children are practicing self-regulation and executive functions.³⁷

Studies have also established links between different types of free play, and children's academic outcomes. In an observational study with 450 Norwegian toddlers,³⁸ researchers compared three groups – children with weaker, middle and stronger motor skills – and found that physical play experiences were linked to children's mathematical abilities. Another study documented young children's spontaneous exploration of physical phenomena during play with objects, showing that children came across forces, energy, magnetism tension, friction and simple machines.³⁹ In addition to these learning opportunities, research finds benefits of free play for children's self-esteem,⁴⁰ health and well-being.⁴¹ Since we draw the line at depriving human children of free play altogether, we rely on experimental studies with animals for causal links. Such studies find that rats deprived of play as pups have impaired problem-solving and social abilities, and differences are noticeable in their brain structure.⁴²



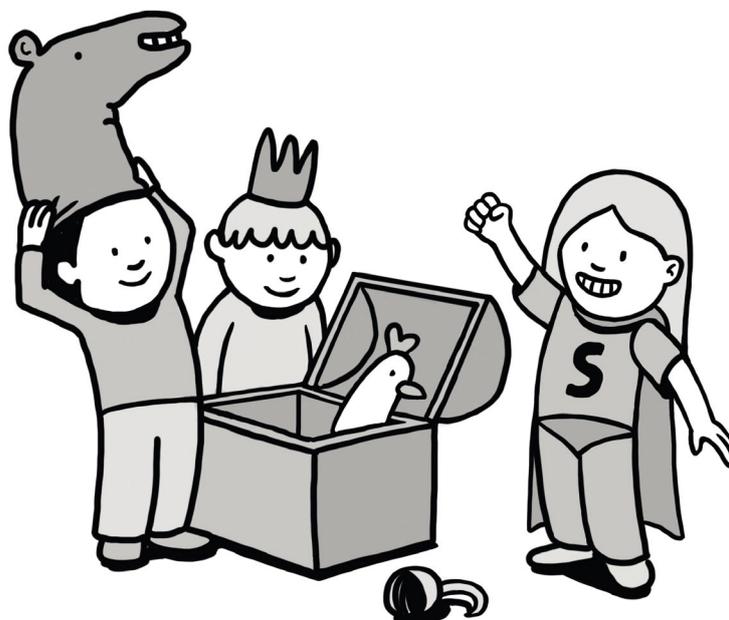
Play is intrinsic to the human being from birth. It is a source of knowledge, relationships, interactions and learning. It is from play that every child comes to form his or her individuality and role in the community.

Jennifer Vega,
aeioTU, Colombia

What makes free, unstructured play unique is that children can follow their own interests and build a play environment that suits their experiences. Just think of children playing outdoors. Grass or sand offer endless material for play and learning; if children find an insect, this adds a whole new level to the experience. Take a divot of grass or box of sand indoors with two insects, and you have a new learning context. Nature is always evolving, with each season and landscape bringing its own first-hand material for play, inspiring children with new ideas for creating play worlds. Seen in this light, child-led play can be considered a form of creative sharing. In peer play, children meet others' ideas and motives, make meaning and practice skills to create different things; they encounter power structures, conflict and negotiation. Children also enact what they hear and see, according to their own understanding. In a study from South Africa, Ebrahim and Francis (2008)⁴⁴ saw children reproducing race and gender discourses in their play, creating hierarchies among certain peers.

Adult roles in children's free play

When children are engaged in self-chosen play they do not need constant guidance. However, adults have important roles to provide time and space for children's safe, and inclusive play. Adults can support children's free play by observing, acknowledging, listening, accepting and meeting requests that assist their play initiatives when necessary.⁴⁵ Sometimes children's free play becomes repetitive, and then adults can inspire children with new experiences and challenges.⁴⁶ As with any social context, there are norms defining how we engage with others, and what is appropriate and accepted. Naturally, these count during children's self-directed play, and so free play does not equal free-for-all. A final point to make is that, in free play, young children often veer towards playmates who are similar to themselves. For instance, children with language difficulties prefer playing with each other. In doing so, they miss opportunities to practice in the context of engaging peer play.⁴⁷



Key features of free play

- Child initiates and directs
- Less structure and more choice

Children set own goals in the play, following their interests. They are often very active: exploring, asking what if, re-inventing ideas and creating new meanings.



Adult roles

Observe, listen to and acknowledge children during play. Support when children struggle (for example) to join peer play, explain their ideas or needs, make plans or regulate their emotions.

Child benefits

Free play is linked to executive functions, self-regulation, social skills, self-esteem, health and well-being. Physical play is linked to spatial skills and mathematics.

Learning through guided play

In guided play, adults support children to achieve one or more learning goals within a play context. The idea is to scaffold children's attempts, and not to direct their actions – in guided play, children and adults share control of what to do and how. Adults can join children's play to extend the learning possibilities through questioning or suggestions. They can also initiate a guided play activity that builds on children's interests, for example by choosing materials that guide children to discover a learning goal.

Numerous studies support adult involvement in play to promote early learning. For instance, in a study by Fisher and colleagues² the guided play activity, in which children discovered the 'secrets of shapes' in a playful, exploratory way with the support of an adult, led to a more robust and flexible notion of shapes. In another study, three- and four-year-olds were supported to come up with stories and perform these for the whole class.⁴⁸ For one year, six classes engaged in these story-telling activities, while seven control classes continued their usual activities, which did not include many structured educational activities. Children in the story-telling classrooms improved significantly more on narrative comprehension, print and word awareness, pretend abilities and self-control. Other comparison studies find that adult-facilitated play promotes young children's self-regulation,⁴⁹ reading comprehension and language⁵⁰, vocabulary⁵¹ and mathematical knowledge.⁵²

Taking a starting point in children's interests and sharing control in guided play can happen in many ways. Children building with blocks will often go as high as possible. Noticing this, an educator can suggest they compare which tower is taller, count how many blocks each tower has, and even use blocks as a unit of measure to compare heights and lengths of all kinds of objects in the class. Such efforts to deepen children's learning require that questions and suggestions make sense in the play scenario. Imagine if these same children were building a city instead. In this case, asking them to count blocks or compare towers would disrupt rather than deepen their play.

In addition to extending children's existing play, adults can initiate guided play. First, a play scenario is prepared using materials at hand – for a grocery store, this could be old packaging and boxes. Before starting the play, children are introduced to concepts such as writing a shopping list, using simple addition to determine how much the items on the list will cost, and jobs in a store. Then they are invited to play, choosing what roles they want, negotiating how much the food will cost, and playing through imagined scenarios. In this example, the adult constrains the possibility space by setting up a play context with learning goals in mind, but children decide what happens in the grocery store. Within this play, adults can scaffold learning targets when appropriate by drawing children's attention to certain features, providing comments and questions, or becoming active play partners.⁵³

Creating play contexts can also happen as a collaboration. In one classroom study, children were keenly interested in animals, so the adults and children decided to create a veterinary clinic.³⁵ This new play centre was infused with a variety of materials to encourage literacy practice. The children also read books about animals, wrote down instructions for pet owners, and recorded patient appointments. When the children became unsure how to tell if an animal had a broken leg, the adult introduced the concept of an x-ray machine, offering them a meaningful extension to their created play context. Yet another way to facilitate children's activities during imaginary play is to help them verbalise their plans before the play starts. This can support their ability to guide their own actions throughout the play scenario.⁵⁴



Key features of guided play

- Adult initiates and child directs
- Balanced structure and choice

The adult sets goal(s) attuned to children’s learning needs and interests. Children choose what to do and how; the adult is present and interacting with children, but cannot direct their actions.



Child benefits

Guided play can lead to higher gains on literacy, numeracy, social skills and self-regulation skills than instruction or free play alone.

Adult roles

Create a play context, with or for children, with an embedded learning focus (e.g. a grocery store with signs and paper money).

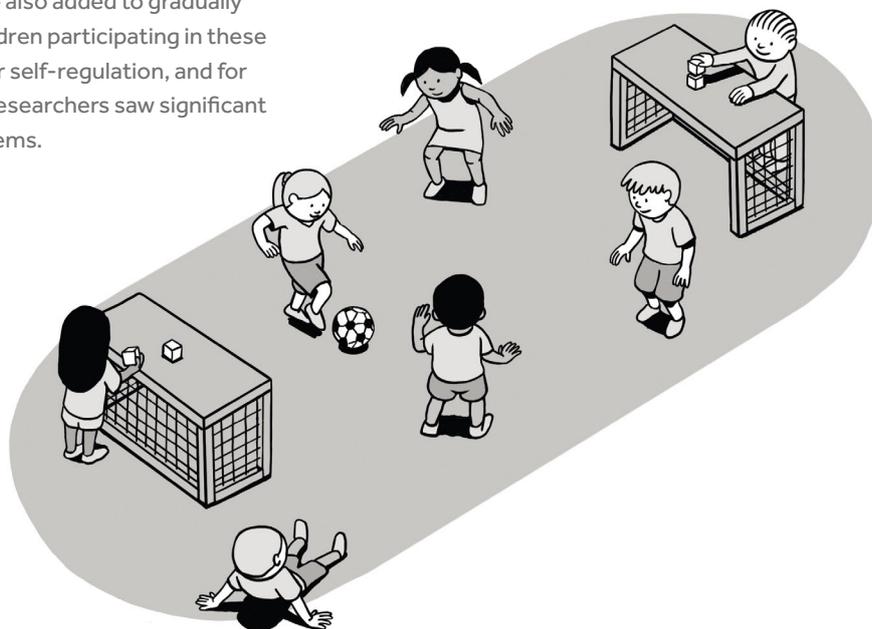
Observe, build on and extend children’s thinking and ideas.

Learning through games

In many ways, games operate like guided play, but with the game itself providing the rules, structure and learning goals, rather than those elements being provided by the adult. Since the game provides these rules, children may feel more agency than in adult-facilitated play activities. Still, adults have important roles to help young children getting started, including by introducing game rules and assisting them with taking turns.

Young children engage in many types of games, from physically focused outdoor games such as tag and hide-and-seek, to board and card games, and then to digital games. Conceptualising games as a type of playful learning is a recent development,⁵⁵ but research has shown promising links between games and both content learning and skills development. One study observed game play during recess throughout children’s first year of primary school, and found that children taking more initiative in game play also had better social skills.⁵⁶ Board and digital games research suggests that, when intentionally designed and implemented, games can support the development of maths and early literacy skills.^{57,58,59} An experimental study with 276 children attending Head Start classrooms tested music-based games as a way to promote children’s self-regulation; over the course of the eight-week intervention, these games were repeated but rules were also added to gradually increase the challenge.⁶⁰ Children participating in these play groups improved on their self-regulation, and for English Language Learners, researchers saw significant gains on applied maths problems.

While this early research is promising, we still have many questions left unresolved. How do games work for young children’s engagement and learning? To what extent do early childhood programmes use games to meet specific learning goals, and often do children themselves engage in games, why and so on. What we do know is that adults can facilitate game play in a variety of ways. Educators can create a game that targets certain learning goals – whether turn-taking and social skills, concepts or vocabulary words. Well-known local games can be a way to engage children in their history and heritage, while also strengthening their grasp of concepts. Like Diketo, a stone-throwing coordination game from Botswana, which uses shapes and groupings found in mathematics, as well as concepts of gravity and texture from early science.⁶¹ Children also love to invent their own games. In one study, educators provided literacy-rich materials, and encouraged children to come up with game-based activities; this in turn improved their literacy skills.²⁴





Key features of games

- Context provides structure and choice within game rules

Game rules set goals and scaffold interactions between players. Children play by game rules; this way, the game directs the activity. Children must have agency and choice in the game.

Adult roles

Get children started by setting up a game, or help children choose a game to play together.

Support children in understanding and practicing rules of the game (taking turns, for example). Help children join a game with peers.

Child benefits

Well-designed games can lead to literacy and numeracy skills (digital and physical games). Music games can lead to improved self-regulation.



Combining practices across the spectrum

Even though it is tempting to focus on how different the practices are – free play, guided play, games and instruction – and that one might be ‘best’ overall, doing so would miss this important point: Children have different learning interests and needs, and a great facilitator combines practices to meet children where they are and support them to grow. In their review, Lee and Anderson (2013)⁶³ came to the same conclusion on combining practices: Instruction is great for drawing the learner’s attention to critical features in an example, and address misconceptions, while the strength of scaffolded discovery is that learners can practice applying new strategies and concepts. Using both instruction and discovery learning fosters a deep, conceptual understanding that children can apply to novel situations.

Young children are naturally curious and keen to learn; when they discover something new and intriguing, like magnets sticking to metal objects, children are spurred to test the limits of this new finding.³⁹ Research also shows that they are sensitive to cues – including instructions – from knowledgeable adults. Bonawitz and colleagues (2011)⁶⁸ found that when adults demonstrated the functions of a toy, children discovered fewer functions when exploring the toy in play than if the adult was ‘interrupted’ midway. Like Lee and Anderson (2013), they suggest delaying instruction until young children have had a chance to investigate new materials, activities and concepts. Adults can also spark children’s interest in early literacy and numeracy by demonstrating problem-solving activities related to real-life situations.⁶⁹

Children have different learning interests and needs. A great facilitator combines practices to build on what they know and care about, supporting children to grow.

Choosing practices to suit purpose

From studies cited in this white paper, you will note that young children can learn similar skills in more ways than one. If so, which practice does it make sense to adopt? To answer this question, we suggest looking beneath the surface, so to speak, and consider what characteristics make for deeper learning: Children learn more when they are actively engaged as opposed to passive, when activities are meaningful to them, and when they learn together with others. For playful activities, it appears their inherently joyful and iterative nature fuels children’s engagement and learning even further.³³ Different practices across the spectrum may be high on some characteristics and not others. Free play is often physically active, highly joyful and meaningful to children; they can choose what to do and how, integrating several skills and perspectives at the same time. While young children are unlikely to spontaneously learn letter sounds and other specific learning goals through free play alone, they do practice whatever skill, idea or situation they are keen to master, bond with peers, build friendships, and benefit from physical activity.

In guided play and games, we find more guidance from adults and game rules, which is well-suited for specific learning goals. Guided play practices retain children’s playful exploration and choices, just as they often feature social learning opportunities. Instruction is even more specific and can help young children to notice important information and steps, rather than leaving them to re-discover centuries’ worth of knowledge on their own. Educators can combine practices to help children progress, from the early stages of grasping something new to gradually growing adept and dealing with more challenging tasks.



Playful experiences are worthwhile in early education because children find them highly engaging – driven by an inner curiosity and enthusiasm, they try harder, persist for longer and think more deeply.^{70,71} Two studies looking at young children’s engagement in school settings further illustrate its importance. The first is a longitudinal study from the United States, where investigators followed 347 children from age 5–6 in kindergarten and until eighth grade.⁷² In this study, children who grew more engaged, responding to requests and tasks in a cooperative way, also had greater long-term gains in reading and mathematics. Another US study followed 241 children from end of preschool and through their first year of formal schooling; being more cooperative and working independently in class was directly associated with children’s achievement.⁷³

Children have more opportunities to learn when educators are warm and respond to their cues; when children’s knowledge and interests become the starting point for expanding their understanding and repertoire of skills; when activities and materials capture their interest and support them to be active and absorbed.⁷⁴ The activity setting also makes a difference. In a US study with 1407 pre-schoolers, 75 researchers mapped the interactions children had with educators across free-choice and adult-directed activities.

Their findings revealed that when children engaged with a responsive educator in free-choice activities, they had better language and self-control. This combination of benefits did not occur for those children spending more time in adult-directed activities or in free-choice activities with no adult presence.

Responsive adults build on what children know and care about, spark curiosity, and deepen children’s understanding of new ideas, skills and content. When children are engaged, they bring themselves into a learning activity, often by thinking of ways to enrich the experience and take the activity even further.^{76,77} Depending on the literature we consult, this style of interacting has different names, including serve-and-return,⁷⁸ responsive teaching⁶⁵ and autonomy-supportive teaching.⁷⁶ In this white paper, we call this style facilitation. Facilitating children’s learning is different from thinking of teaching as ‘delivering content’ because the goal is for young children to understand concepts and develop a breadth of skills they can apply. Culture clearly shapes the relations young children have with adults; even so, research finds that engagement is at the heart of human learning and growth across cultural settings.⁷⁹

Children's engagement depends on their sense of autonomy. Having autonomy in a situation is about feeling ownership and making choices, rather than being free from all constraints.⁸⁰ If we think of games, these have clear rules and within this structure, players can decide what actions to take. Free play may have few rules (though children can choose to invent new rules in their play), but like any social context, norms apply for what is acceptable, such as sharing among peers or voicing a want, and what is not accepted, like hitting. As facilitators, adults can adjust how much structure and scaffolding they provide. More structure means a smaller 'possibility space' and fewer choices to navigate. This may be ideal for a child embarking on something new, like learning to share or trying a game for the first time. Less structure means children have more room to direct their own actions. This way, they can practice a new skill or understand how a concept applies under changing circumstances. As children practice, facilitators are present and ready to offer support when a child might be struggling.

Reeve (2006)⁸¹ uses these four principles to summarise what great facilitators do:

- **Attune** - facilitating adults sense children's state of being and adjust their own actions accordingly. They listen closely to what children say, make an effort to read the situation, and to be aware of what children want and need.
- **Relate** - great facilitators care about their young learners, create a close bond and ensure that children know they are important through warmth, affection and approval.
- **Be supportive** - during a learning activity, adults accept children as they are, encourage their attempts, and assist them to reach their own goals. This way, children feel competent, creative and more in control of their own learning.
- **Discipline gently** - if children overstep, facilitators guide and explain why one way of thinking or behaving is accepted and another is not, in a supportive way.

To summarise, each practice across the spectrum has affordances and suits several learning purposes – those that balance learning goals and learner agency, like guided play and games, enable children to practice

a suite of skills at the same time – for example, self-control, language and literacy.⁷⁵ Playful experiences, in particular free play, offer a safe space for children to grapple with uncertainty, imagine new possibilities and come up with solutions. For instance, researchers have noted striking similarities between pretend play and creative processes,⁸² and propose play as strategy to foster coping skills.⁸³ In early learning settings, children tend to outnumber the adults present, and so there are more opportunities to engage with peers than with adults.⁸⁴ This way, each child can engage actively, on equal footing, and create shared content with peers, such as a play scenario or new rules for a game. Free play with peers can reveal what children are captivated by or find hard, allowing adults to take note as inspiration for future activities.

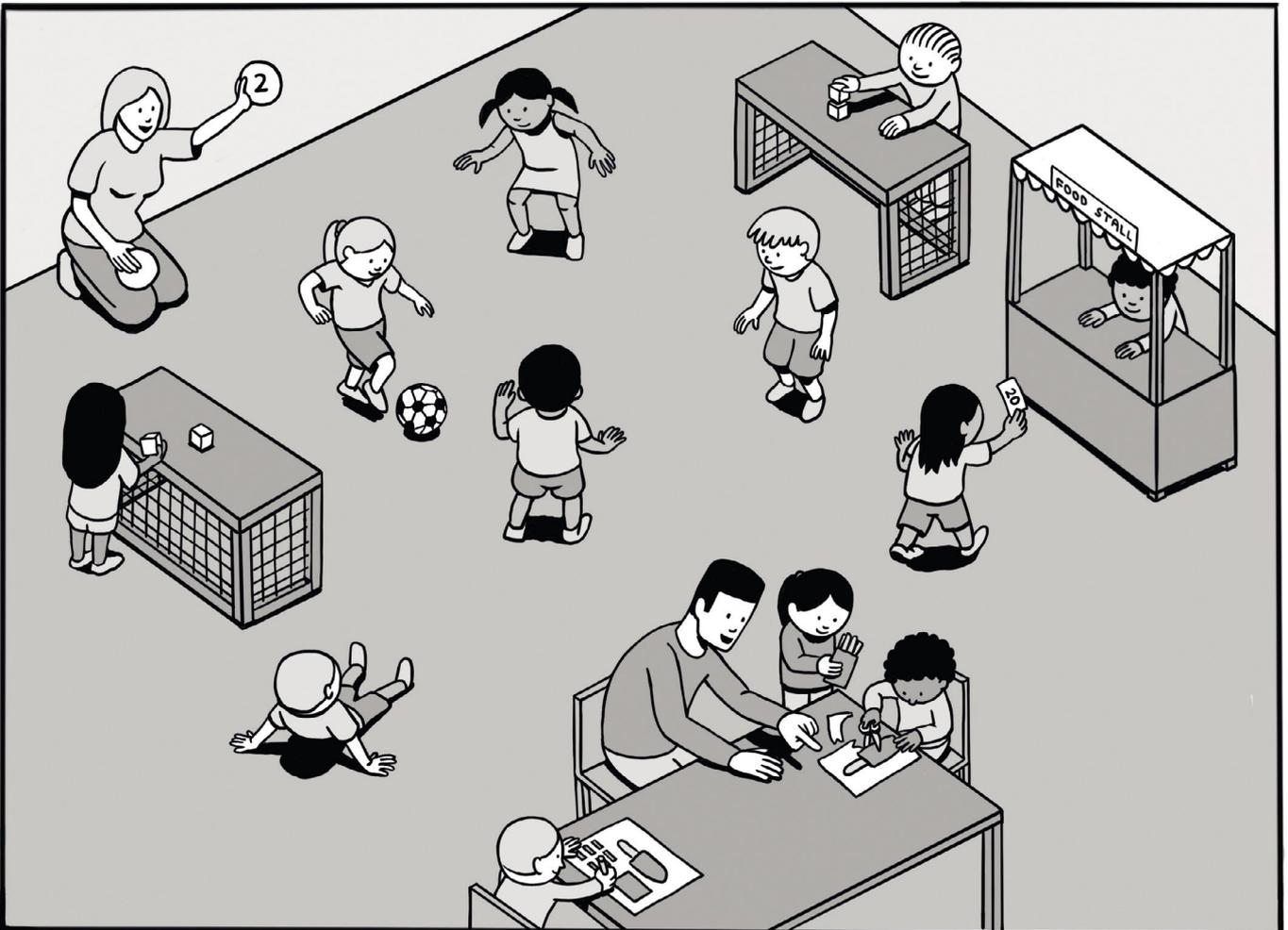
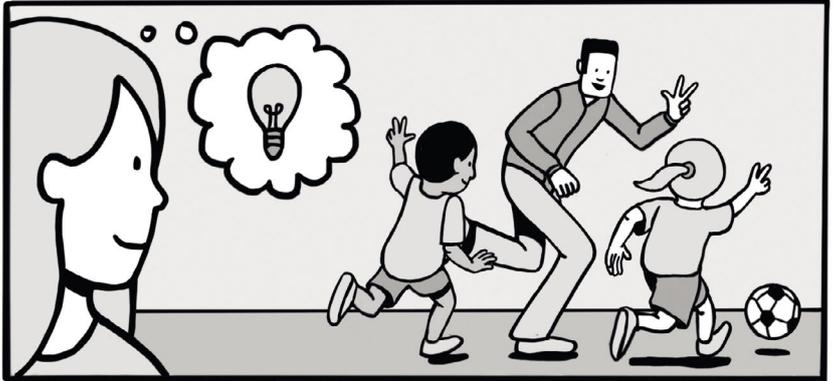
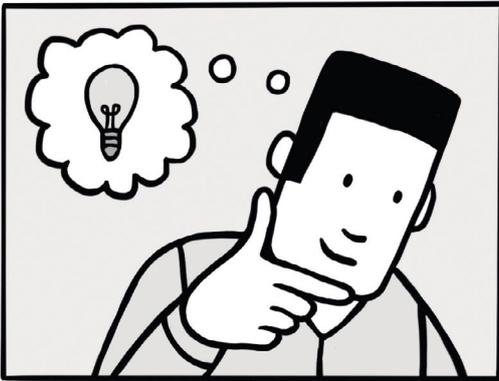
Play facilitation and high-quality instruction are worthwhile because they foster children's engagement, in turn leading to deeper learning and mastery. Good play facilitation and responsive teaching require an intentional adult role – one of enriching and expanding children's ideas, interactions and explorations. Great facilitators can integrate academic learning with children's self-chosen play, for example by demonstrating the value of early numeracy and literacy activities.⁶⁹ It takes practice for adults to become intentional and tactful in this way but doing so is especially important in play contexts because the playful part vanishes as soon as children's sense of ownership is stifled.^{85,86}



Promoting play is something every educator can and should do. A good start point is to identify children's interests through signs in their dialogues, actions and creative expressions. The next step is to ask: How can I help children to build worlds that allow them to play and learn around those interests?

Laura Guzmán, aeioTU, Colombia

In play, children reveal what they are captivated by or find hard. Facilitating adults can take note as inspiration for future activities.



Realising play facilitation in practice: country cases

Most of the research in this white paper has taken place in Western settings. This is a tremendous challenge, especially when it comes to implementing play facilitation in different cultural contexts. The social norms of a given country, policies and curricula, the education level of professionals working with young children and many other factors shape opportunities and barriers for implementing effective, play-based practices – and at scale.

The following seven cases exemplify how early learning settings differ widely from one country to the next. The cases represent cultures in the global South, North, East and West, showcasing contexts where free play has long been a cornerstone practice of early education, contexts where children’s play is not a priority, and contexts where academic goals and play-based practices are mandated side by side.



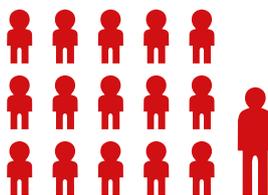


Canada

Canada's education system is provincially mandated, and early education of children differs throughout the country. In Ontario, for instance, all children are provided with universal care in the calendar year when they turn four. Kindergarten is a two-year, full-day programme for four- and five-year-olds that is freely accessible to all.⁸⁷ British Columbia⁸⁸ and Nova Scotia⁸⁹ also offer full-day kindergarten but as a one-year programme for five-year-olds. Across the country's provinces and territories, there are standardised expectations for children during the kindergarten years. These cover specific learning outcomes in language, mathematics and science, but they also reflect a recognition of the importance of other critical early learning skills in the areas of children's personal, social and emotional development.⁹⁰ Children are typically taught by both a certified teacher and a registered early childhood educator.

Play has been an important concept in Canadian kindergarten classrooms for decades. More recently, play-based learning has become a key facet. Free, imaginative play remains a component of play-based learning, but teachers are now mandated to use play as a pedagogical approach, and this includes the integration of academic learning in play-based contexts.⁹⁰ Educators in Canada have considerable independence in relation to their daily planning, and implementations of this play-based pedagogical approach differ in time being spent in whole-group and small-group instruction, and child-centred play.⁹³

Adult-child ratio¹⁴²



Staff educational level:

certified teachers hold both a bachelor's degree and a teaching degree at either bachelor or master's level⁹¹ (on average, 55% of staff are qualified)⁹²



United States

Early education in the U.S. is quite fragmented; programmes are delivered by large and diverse sectors, including the federally-funded Head Start programme, state and local preschool programmes, centre-based child-care, and more informal (typically unregulated) care.¹⁰⁹ Programmes share a broad goal of supporting young children's development and learning, but have different expectations for outcomes. Public preschools and Head Start have clear standards that encompass: 1) approaches to learning, 2) social and emotional development, 3) language and communication, 4) literacy, mathematical development, scientific reasoning, and 5) perceptual, motor and physical development.

Early childhood classrooms tend to fall into one of the three broad categories in relation to their approach to play and learning.¹¹¹ Some are very play-based, and children in these settings spend the majority of their time in free play. Others are very academically focused, with children spending the majority of their time in whole-group and small-group learning. A final type of classroom is one Fuligni and colleagues (2012)¹¹² refer to as "Structured-Balanced." In these classrooms, children spent relatively equal time in child-directed, free-choice play and more teacher-directed whole-group and small-group lessons. Over the last 15 years, studies suggest a tendency for programmes to shift from play-based to more teacher-directed.¹¹³

Adult-child ratio¹⁴³



Staff educational level:

bachelors degree¹¹⁰

State preschool: 92%

Head start: 52%

Child care programmes: 12%



Mexico

Since 2008, early childhood education has been obligatory for children aged 3 to 5. However, 60% of children aged 3 were not registered in kindergarten programmes in the school year 2012–2013.¹¹⁴ The sector is currently undergoing a curricular reform, introducing a new educational model¹¹⁵ scheduled to come into effect in August 2018. In this reform, the areas emphasised for children aged 3 to 5 are: 1) emotional development, 2) communication and social skills, 3) motor skills, 4) interest in reading and natural phenomena, 5) mathematical thinking, and 6) art, creativity and imagination.¹¹⁶

Using teachers' journals, Mexican teachers' daily practices with young children were recently

documented.¹¹⁸ Teachers reported spending less time on children's personal and social development or using didactic practices other than the ones prescribed by the curriculum. The new curriculum of August 2018 emphasises play and working with peers as powerful educational strategies. Play is positioned as a right for children, and it features learning opportunities enabled by play.

Adult-child ratio¹⁴⁴



Staff educational level:

bachelor's degree (52%), vocational degree in education (educación normal, 20%) and high school (8%)¹¹⁷



South Africa

From ages 3–5, children are catered for in early learning group programmes, while the 5–6-year-olds are catered for in Grade R, the first year of basic schooling. Both the early learning¹⁰⁴ and Grade R¹⁰⁵ curricula focus on communication and language, mathematics and life skills. Though named differently in the two documents, 'life skills' cover personal, social, emotional and creative development. Policy makers are currently debating how to better connect the developmental and academic goals of the two curricula.

In South Africa, learning through play is accepted as a principle in practices with children aged three to six. Even so, implementation is problematic. In unregulated settings, and where there is a lack of government monitoring, ratios are not necessarily adhered to. For 5 and 6-year-olds, class sizes are

uneven across provinces due to high demand.¹⁰⁷

Then there is the lack of relevant training, absence of programmatic guidelines, parental expectations and narrow perceptions of school readiness.¹⁰⁸ So, despite play-based learning being mandated, workbooks and scripted lessons continue to drive pedagogical efforts, and play is often merely associated with break time.

Adult-child ratio¹⁰⁶



Staff educational level:

vocational certificate (Grade R) or largely unqualified (ages 3–5)¹⁰⁸

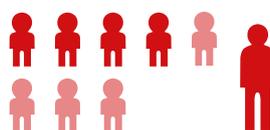


Denmark

Denmark has a publicly funded early childcare system and 98% of children attend professional care outside the home from ages three to six.⁸⁴ These settings are described as 'childcare' or kindergartens instead of 'preschool' to reflect a holistic focus on children's whole development, social skills, well-being, participation, democratic values and care. There are no specific academic standards. Instead, the pedagogical environment should promote learning across six themes: 1) identity and character development, 2) social development, 3) communication and language, 4) physical and sensory development, 5) nature and natural sciences, and 6) culture, aesthetics and community).⁸⁴

Every moment in childcare – whether routine times, outings or time spent in the playground, is considered learning in a holistic sense; whole-group instructional activities are rare.^{97,98} Children's free, unstructured play is a cornerstone practice in Danish childcare, with educators often taking roles as observers, preparing play environments, supporting children to resolve conflicts, and helping during routines. They also assess children's progress and plan remediating actions if needed, for example on language learning.⁹⁹

Adult-child ratio⁹⁵



Staff educational level:

bachelor's degree in pedagogy (on average, 60% of staff qualified)⁹⁶



Finland

In 2016, around 68% of 1–6-year-olds participated in early education, and most attended full-day care; about 85% of educational provision was public.¹⁰⁰ There are no specific objectives for academic skills for children aged 3 to 6.¹⁰¹ The Finnish curriculum describes five interconnected competence areas: 1) thinking and learning, 2) cultural competence, interaction and self-expression, 3) taking care of oneself and managing daily life, 4) multi-literacy and competence in information and communication technology, and 5) participation and involvement. The expectations do not differ by age, but practices progress with children to build a foundation for lifelong learning.

Finnish early education is based on an integrated approach to care, education and teaching (educare) in which learning through play is essential. Findings from a large-scale observational study indicate that children spend over a third of their day in play.¹⁰³ Most of this play time was child-directed free play, with much less time spent in more adult-led play activities. The study also indicated that children were most engaged during role play, and least in play with materials and objects. More teacher support and improved learning environments may be needed to deepen Finnish children's engagement with material play.

Adult-child ratio¹⁰²



Staff educational level:

bachelor's degree in early education (minimum 33% of staff)¹⁰²

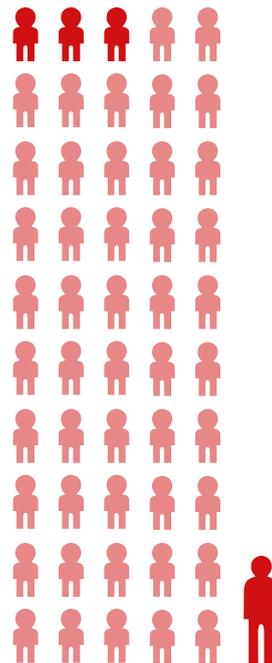


China

China has private and publicly funded kindergartens.¹¹⁹ The government ensures quality of practices in public settings, but not in private kindergartens.¹²⁰ In urban areas, Montessori, Reggio Emilia and High/Scope-inspired settings are catching on¹²¹ while in rural areas settings often lack furniture, materials and qualified staff.¹²² Early education standards are influenced by progressive, Western approaches, with learning goals grouped into five areas – 1) health, 2) science, 3) language, 4) social studies and 5) arts.¹²³

Play-based approaches are mandated in Chinese curricular documents.¹²³ In practice, however, ancient cultural values continue to hold sway. This is illustrated in common sayings like: *ye jing yu qin*, *huang yu xi* ('a career is refined by hard work but ruined by play').¹²⁶ Chinese early educators prefer lecture-based instruction over small-group and child-led approaches,¹²⁷ just as 'physical play' takes the form of group exercises and structured physical activities.¹²⁸

Adult-child ratio¹²⁴



Staff educational level:

two-year associate degree (in rural areas, most educators hold a high school diploma or less)¹²⁵

Realising playful, engaging practices

Play facilitation holds immense promise for young children's engaged and effective learning. However, as the country cases illustrate, bringing this promise to fruition is not straightforward. One key reason is that educators often are unsure about their role in children's play. While many regard play as a way for young children to learn, they tend to switch between a passive, observing role during child play and direct instruction of academic content. And this is a tendency we see emerging across countries. If we return to the case of Canada, early educators often struggle to negotiate what they see as competing priorities associated with children's developmental learning (such as social and emotional development) and their learning of academic content. This struggle comes out in assessment strategies, when adults remove children from play contexts to conduct formal assessments of academic skills.¹²³

The country cases further show that, while children's learning through play is mandated in policies governing early education in South Africa, Finland, Canada, Denmark and China, this mandate comes to life in diverse ways. Young children in Finland typically spend more than 2 hours per day engaged in self-directed play. In South Africa, this kind of unstructured free play is associated with affluence, and disadvantaged settings lean towards directive approaches, a practice rooted in concerns for learning deficits among children from low-income homes. In China, play and learning are seen as opposites in the country's cultural tradition; as a consequence, Chinese early educators prefer whole-group, lecture-based instruction, even though this is at odds with the country's curriculum guidelines.¹²³



Culture, norms and beliefs shape practice

What educators believe to be true about ‘good’ teaching, how young children learn, the benefits of play for learning and development and whether children can and should direct their own actions, all of these are factors that shape moment-to-moment interactions in practice.^{93,129} To be successful, efforts to equip educators as play facilitators must consider local culture, beliefs and curriculum goals. For instance, a South Korean study found that educators were more likely to benefit from training in facilitation when they viewed children’s engagement as a key to learning, and when they strove for personal growth and learning themselves.¹³⁰ In short, it seems that early learning professionals need help to realise just how important their interactions with children are, especially in play contexts. They may also need support as they expand their ‘toolbox’ to encompass both traditional conceptions of child-directed play, guided play and more direct instruction with children as active participants.

Play facilitation takes knowledge and skills

Finally, the case countries highlight how policies shape play discourses and practices in early learning settings. In Canada, Stagg Peterson and colleagues (2016)⁹⁰ note the inconsistency with which policy documents describe play and its role in children’s learning – some omitting play from the discussion entirely and others describing its vital importance. Play-based practices are also rarely a focus during initial education and professional development. In the United States, Ryan and Northey-Berg (2014)¹³⁴ found that play was usually considered a component under developmentally appropriate practices, rather than being a content area in itself. This is problematic, since well-educated early childhood professionals are often better at creating stimulating environments and providing high-quality pedagogy.¹³⁵

Research gaps and future directions

The research reviewed in this white paper leaves little doubt that: 1) children can and do learn through play; 2) 'play' consists of a spectrum of playful practices and these can support a variety of learning outcomes; 3) adults have a critical role in facilitating and scaffolding children's playful learning; and 4) the policies and social and cultural contexts in which young children reside influence their opportunities to experience playful and engaging practices.

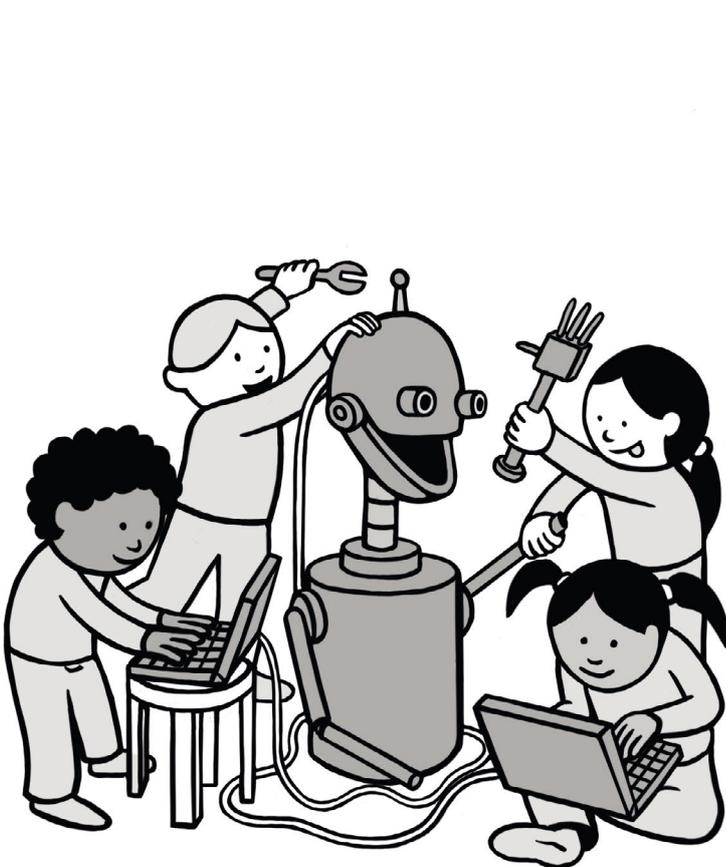
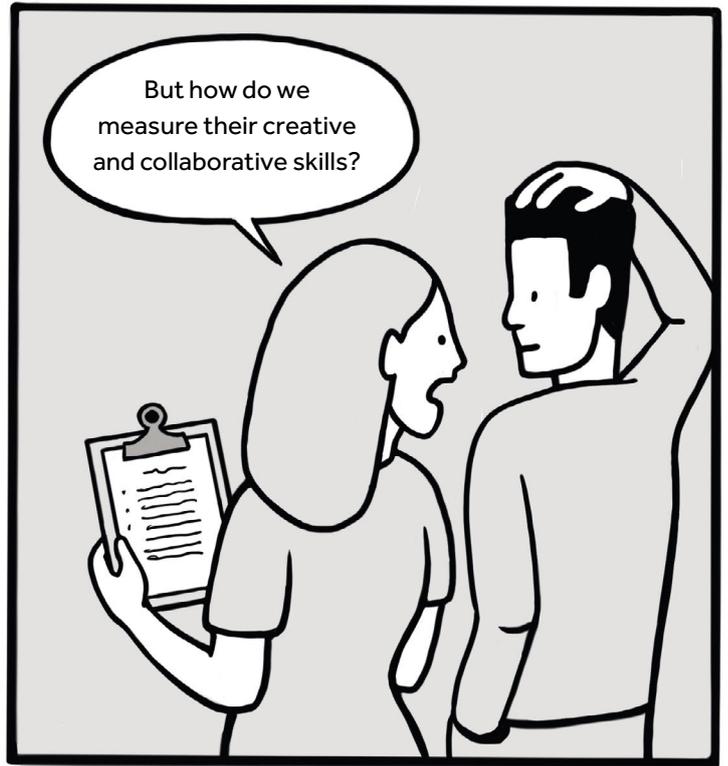
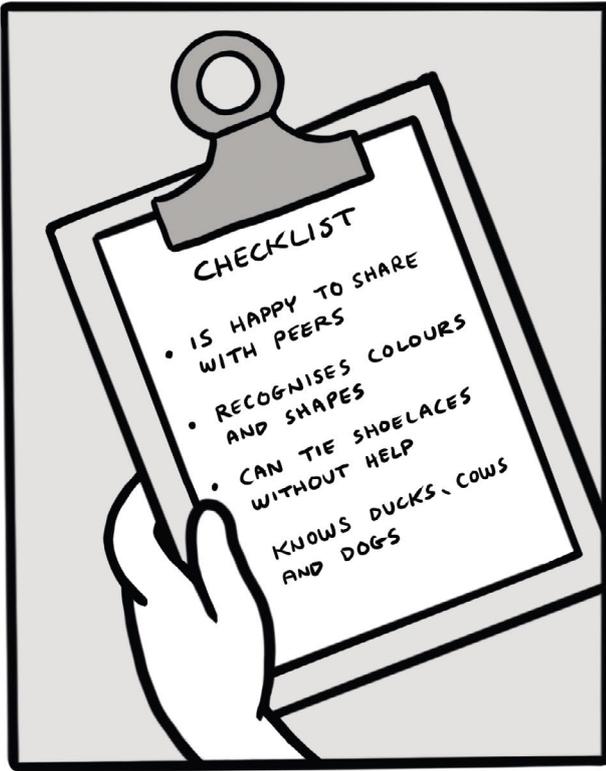
As seen from studies cited, play facilitation is a topic that sits between disciplines. Findings come from research on play, child development and health, neuroscience, educational psychology, socio-cultural studies and more. Most of the research on adult-facilitated play has taken place in Europe and the United States, raising issues of relevance across cultures and contexts. The white paper also highlights how playful learning is far from reality in many communities across the world. Our recommendation for the next generation of research on play in early learning settings is to focus on questions at the intersection of policy and practice – questions that may help us move playful learning from a vision into practices that serve young children across the globe.

- **How can we measure the impact of play facilitation, including skills like collaboration and creativity?**
- **How can we best support educators as facilitators and implement play facilitation at scale?**

Measuring the impact of play facilitation

Currently, classroom research can point to quality practices, and find that adults are essential. But there is room for improvement. Burchinal (2018)¹³⁶ notes how existing measures of classroom quality are good at differentiating very good classrooms from very bad ones, however, 70-80% of the classrooms measured land in the midrange. Through secondary analyses of U.S. data, Zaslow and colleagues (2016)¹³⁵ found a threshold effect for teacher-child interactions: benefits for children's language and literacy skills only emerged once a moderate to high level of interaction quality was reached. If classroom interactions improved from low to slightly higher, this progress did not translate into greater gains for children. We clearly need more robust and comprehensive tools that will help us to understand nuances in practice and how these link to child outcomes, including for play contexts.

Studies that evaluate early learning programmes, including those featuring play-based approaches, tend to rely on brief measures of child outcomes, like vocabulary tests; it is much less common for such studies to include more measures of skills that resonate with a 21st century learning paradigm, including communication, collaboration, problem-solving, self-regulation and so on.¹³⁶ The outcomes measured clearly matter for the gains we can expect from different practices – if we measure how many words children can recall, then direct instruction on vocabulary is likely to come out as more impactful. If, on the other hand, we want to improve children's capacity for solving problems together with peers or understand a concept well enough to apply what they know, the chances are that playful activities are more beneficial.



Implementing play facilitation at scale

Achieving effective play facilitation at scale by equipping teaching professionals as designers and facilitators of playful, effective learning is the next frontier. We know that it is possible to improve early learning practices through a variety of methods, including coaching and coursework, but when it comes to play facilitation, more work is needed. A recent systematic review identified several preschool programmes, which demonstrated impact at scale.¹³⁷ Even though these programmes featured play-based activities, the studies offered few details about how they worked (their active ingredients), practices used and to what extent educators adopted the new curriculum. As a result, lessons learned about scaling play facilitation remain hidden.

That said, there are at least two models for how to equipping early educators at scale. Both involve play-based activities, but they differ in how educators are supported in adopting these novel practices. In aeioTU's emergent curriculum model, the emphasis is on building educators' capacity to tune in to children's interests, design playful activities and learning environment, and to engage children with the goal of co-constructing knowledge.¹³⁸ This model is inspired by the Reggio Emilia philosophy. Finding stark contrasts between this approach and traditional teaching in Colombia, the research and programme teams developed a number of strategies to support educators: 1) continuous scaffolding and professional development, 2) guiding tools and structure, and 3) feedback from a team of aeioTU experts based on classroom visits and observations.

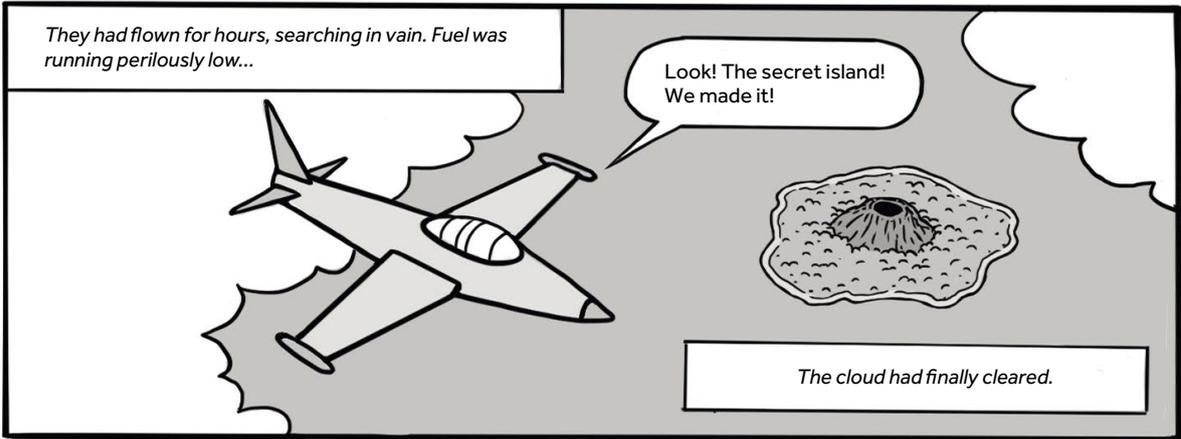
A second, more prescriptive model has been used with several play-based preschool curricula.¹³⁹ In this approach, emphasis is on educators implementing an expert-developed curriculum coupled with regular coaching and training. Weiland and colleagues (2018)¹⁴⁰ propose five 'active ingredients' to account for the success of this model. In addition to the curriculum itself, these include: 1) highly detailed descriptions of activity content and sequences, together with teacher prompts, 2) teachers voicing challenges to programme developers, 3) time is allocated for teachers to prepare, and finally, 4) they receive real-time feedback on how they deliver curriculum activities.

Importantly, the authors note that the point is not to conduct activities in a robotic manner, as this would be incongruent with quality practice. Adults' interactions must still be responsive towards children.

If we contrast these two approaches, we find that the emergent model engages professionals as curriculum co-creators, while the prescriptive model casts them as curriculum deliverers. Some researchers argue that lasting change in early learning practices requires capacity building and improving professionals' judgement, which goes beyond delivering predefined activities with high fidelity.^{140,141} A Danish intervention study illustrates this point. In this study, young children's language and early literacy skills improved most through a combination of the two models. Educators were given the scope and goals of an expert-designed curriculum in early literacy, together with the freedom to respond to children's interests and design play activities that built on these.⁹⁹

To conclude, we need a much clearer sense of how best to realise play facilitation in a given context, and how to sustain programme impact over time:

- Which knowledge, skills and competencies are required for adults to adopt a responsive approach with young children, including during play?
- How can or should adults balance learning goals and child agency in playful activities? What are the complexities of facilitating play, and how is this dealt with? How can educators and caregivers use playful practices to support groups of children with varied knowledge and abilities at the same time?
- How can educators and caregivers best match play practices with outcomes in focus, and design playful learning activities and environments accordingly? How do they set up these learning environments for equal opportunities?
- How can promising models be adapted to suit new cultural contexts, while investigating what works for whom, where and under what conditions? In which ways do political, social, and cultural factors influence playful practices in those contexts?
- Finally, how can we evaluate long-term effects of intentional, play-based practices through studies that follow children through school age and into adulthood?



About this white paper

Two words on methodology

This white paper was written as a collaborative effort between seven researchers from across disciplines and geographies. In the section on the spectrum of practices, we have intentionally favoured larger-scale observational research, experimental studies, reviews and meta-analyses, and tried to include research beyond Western cultural contexts. Throughout the writing process, reviewers with expertise in research, practice and policy have critiqued drafts of the white paper, including questions addressed, points made, and sources used. We are immensely grateful to all our reviewers for their thoughtful comments and contributions.

Thank you to all our reviewers

Kim Foulds (Sesame Workshop, United States), Ferdousi Khanom, Erum Mariam and Sazia Zaman (BRAC University, Bangladesh), Maria Jose Rubio, Maria Paula Angarita, Angela Pelaez, Carolina Bernal and Maria Adelaida Lopez (aeioTU, Columbia), William Teager (Early Intervention Foundation, United Kingdom), Signe Bohm (The Danish Evaluation Institute, EVA, Denmark), Paul Ramchandani (The PEDAL Centre at the University of Cambridge, United Kingdom), Kathleen Hayes (independent education consultant), Audrey Kittredge (early childhood education consultant, New York, USA), Helle Marie Skovbjerg (Design School Kolding, Denmark) and colleagues at the LEGO Foundation.



Hanne Jensen

Children wonder and ask a million questions (my own parents can attest to that!). When given the chance, they can tackle challenges with peers and come up with surprising solutions. Across the world, the reality is that many children have few opportunities to thrive and learn in this way. My work at the LEGO Foundation is about changing this unfortunate reality. At the moment, I research children's playful and effective learning in early education: what it looks like, tactful ways adults can balance learning goals and learner agency in play, and how best to support educators' professional learning and change.

Research specialist, the LEGO Foundation Centre for Creativity, Play and Learning, Denmark, and doctoral student at University of Cambridge, United Kingdom



Angela Pyle

I was so excited for my first day of kindergarten that I broke our front door running to leave the house. I haven't lost that love to this day, and I still enthusiastically spend as much time as possible in kindergarten classrooms. I first spent my time teaching kindergarten in the public school system before returning to graduate school. Since becoming a professor, I continue to explore the world of kindergarten where my research focuses on the educational possibilities of play, including the role of play in the learning of academic content, specifically literacy.

Angela Pyle, PhD, Assistant Professor at the Dr. Eric Jackman Institute of Child Study, Department of Applied Psychology and Human Development, Ontario Institute for Studies in Education, University of Toronto, Canada

Jennifer M. Zosh

As a child, my favourite thing to do was to play school. I didn't realise that it was unique for a child to love to create lessons, assign homework to unassuming younger children in the neighbourhood, and drag out the chalkboard for the daily "class." Even now, I still remember how my goal was to see the sparkle in a child's eye when she "got it" – the magic of understanding – the magic of learning. Despite this being my favourite activity as a child (along with speaking in front of the class), I still struggled with figuring out exactly what it was I was going to do with my life when I began college. But eventually, that sparkle was in my own eye when I realised I could study how children learn and share it with the world! My passions in research, writing, and communicating include the role of play in development, the impact of technology on children and parents, and cognitive development.

PhD, Associate Professor of Human Development and Family Studies, The Pennsylvania State University, Brandywine; Director of the Brandywine Child Development Lab





Hasina Banu Ebrahim

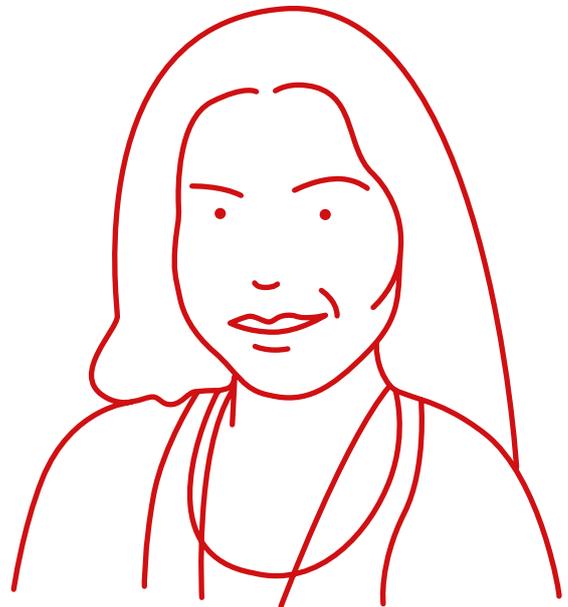
I grew up in an extended family commune in an Indian township in apartheid South Africa. As a child I got to bond with a circle of cousins. I will always remember our play activity of sliding down the bank with my cousins. Because I was a girl, I could never take the lead in our play. Through these experiences I learnt how children are boys and girls, and that there are categories, hierarchies and power issues that influence children's development. Today, my research focus is early childhood care and education at the margins; I interrogate 'dominance' to address issues of context, equity, diversity and social inclusion in the early years. This theme is captured in my latest 12-country co-edited book entitled *Early Childhood Care and Education at the Margins: African Perspectives on Birth to 3*.

PhD, Professor in Early Childhood Education at the University of South Africa, UNESCO Co-chair in Early Education, Care and Development

Alejandra Zaragoza Scherman

How do you know you learned something? Memories have a special place in learning, especially when they relate to our lives. As a memory researcher, I want to learn more about how playful learning helps children create powerful memories about their everyday lives as they develop autobiographical memory skills. My most vivid playful childhood memory is doing jigsaw puzzles with my parents. Currently, I investigate how people from different ages and cultures remember important life events from their personal past, whether these memories are positive or negative, and how the emotional valence of those memories relate to mental health.

PhD, Assistant Professor at the Center on Autobiographical Memory Research (CON AMORE), Aarhus University, Denmark



Jyrki Reunamo

Sometimes I wonder if I understand play better now or when I was a young boy. I've been researching play for more than 30 years and it only gets more interesting. Our perspectives influence the world we see – and children's different orientations produce different content for play and learning. In my view, the key to progressive play is the creative sharing taking place, making it possible for children and adults alike to build a future together. Who could ask for more? In Finland, I like to spend my free time at our country home. I am very proud of my bonsai berry bushes and the garden that has a mind of its own.

PhD, Principal investigator and Director of the Orientation project (blogs.helsinki.fi/orientate), university lecturer at University of Helsinki, Finland



Bridget Hamre

I research the ways in which teachers' daily interactions with children can promote learning and development. A personal milestone is the Classroom Assessment Scoring System (CLASS) measure that I developed together with Robert Pianta and many others at University of Virginia. CLASS is now used across the United States and in many countries around the world. From this work, we find that too few children have access to teachers with the skills necessary to best support early learning. My most recent research has focused on ways to better support teachers to gain these skills – through coursework, coaching and curricular interventions. I'm also the proud parent of an 11-year-old and 4-year-old twins – so I have many opportunities to try (and often fail) at providing effective interactions at home!

PhD, Research Associate Professor and Associate Director at the Center for Advanced Study of Teaching and Learning at the University of Virginia

References

- ¹Barker, J. E., Semenov, A. D., Michaelson, L., Provan, L. S., Snyder, H. R., & Munakata, Y. (2014). Less-structured time in children's daily lives predicts self-directed executive functioning. *Frontiers in Psychology, 5*, 593.
- ²Fisher, K. R., Hirsh-Pasek, K., Newcombe, N., & Golinkoff, R. M. (2013). Taking shape: Supporting preschoolers' acquisition of geometric knowledge through guided play. *Child Development, 84*, 1872–1878. doi:10.1111/cdev.12091
- ³Alfieri, L., Brooks, P. J., Aldrich, N. J., & Tenenbaum, H. R. (2011). Does discovery-based instruction enhance learning? *Journal of Educational Psychology, 103*, 1–18. doi:10.1037/a0021017
- ⁴Care, E., Anderson, K., & Kim, H. (2016). Visualizing the breadth of skills movement across education systems. Brookings Center for Universal Education.
- ⁵World Bank. (2018). *World Development Report 2018: Learning to realize education's promise*. (Overview booklet). Washington, DC.
- ⁶Golinkoff, R. M., & Hirsh-Pasek, K. (2016). *Becoming brilliant: What science tells us about raising successful children*. Washington, DC: American Psychological Association Press.
- ⁷Heckman, J. (2000). Policies to foster human capital. *Research in Economics, 54*, 3–56.
- ⁸Gross, J., T., Stern, J., A., Brett, B., E., & Cassidy, J. (2017). The multifaceted nature of prosocial behavior in children: Links with attachment theory and research. *Social Development, 26*, 661–678. doi: 10.1111/sode.12242
- ⁹Montroy, J. J., Bowles, R. P., Skibbe, L. E., McClelland, M. M., & Morrison, F. J. (2016). The development of self-regulation across early childhood. *Developmental Psychology, 52*, 1744–1762.
- ¹⁰Bohlmann, N. L., & Downer, J. T. (2016). Self-regulation and task engagement as predictors of emergent language and literacy skills. *Early Education and Development, 27*, 18–37.
- ¹¹Jones, D. E., Greenberg, M., & Crowley, M. (2015). Early social-emotional functioning and public health: The relationship between kindergarten social competence and future wellness. *American Journal of Public Health, 105*, 2283–2290.
- ¹²Moffitt, T. E., Arseneault, L., Belsky, D., Dickson, N., Hancox, R. J., Harrington, H., ... Caspi, A. (2011). A gradient of childhood self-control predicts health, wealth, and public safety. *Proceedings of the National Academy of Sciences of the United States of America, 108*, 2693–2698. doi: 10.1073/pnas.1010076108
- ¹³Ramani, G. B. (2012). Influence of a playful, child-directed context on preschool children's peer cooperation. *Merrill-Palmer Quarterly, 58*, 159–190.
- ¹⁴Ramani, G. B., & Brownell, C. A. (2014). Preschoolers' cooperative problem solving: Integrating play and problem solving. *Journal of Early Childhood Research, 12*, 92–108.
- ¹⁵Timmons, K., Pelletier, J., & Corter, C. (2016). Understanding children's self-regulation within different classroom contexts. *Early Child Development and Care, 186*, 249–267.
- ¹⁶Doherty, A. (2012) Teacher, I showed her how to do that! *Primary Science, 122*, 24–26.
DSD and UNICEF. (2015). *National integrated early childhood development policy*. Retrieved from https://www.unicef.org/southafrica/SAF_resources_integratedecdpolicy.pdf
- ¹⁷Cremin, T., Glauert, E., Craft, A., Compton, A., & Stylianidou, F. (2015) *Creative little scientists: Exploring pedagogical synergies between inquiry-based and creative approaches in early years science*, *Education 3-13, 43*, 404–419.

- ¹⁸ Saracho, O., & Spodek, B. (2006). Young children's literacy related play. *Early Child Development and Care*, 176, 707–721.
- ¹⁹ Pyle, A., Prioletta, J., & Poliszczuk, D. (2018). The play-literacy interface in full-day kindergarten classrooms. *Early Childhood Education Journal*, 46, 117–127.
- ²⁰ Roser, M., & Ortiz-Ospina, E. (2017, March). Global extreme poverty. Our world in data. Retrieved from <https://ourworldindata.org/extreme-poverty>
- ²¹ Law, J., Charlton, J., & Asmussen, K. (September 2017). Language as a child well-being indicator. Early Intervention Foundation.
- ²² Eunice Kennedy Shriver National Institute of Child Health and Human Development, NIH, DHHS. (2010). Developing early literacy: Report of the national early literacy panel (NA). Washington, DC: U.S. Government Printing Office.
- ²³ Hirsh-Pasek, K., Adamson, L. B., Bakeman, R., Owen, M. T., Golinkoff, R. M., Pace, A., ... & Suma, K. (2015). The contribution of early communication quality to low-income children's language success. *Psychological Science*, 26, 1071–1083. doi: 10.1177/0956797615581493
- ²⁴ Cavanaugh, D. M., Clemence, K. J., Teale, M. M., Rule, A. C., & Montgomery, S. E. (2017). Kindergarten scores, storytelling, executive function, and motivation improved through literacy-rich guided play. *Early Childhood Education Journal*, 45, 1–13.
- ²⁵ Xu, F., Spelke, E. S., & Goddard, S. (2005). Number sense in human infants. *Developmental Science*, 8, 88–101.
- ²⁶ Feigenson, L., & Carey, S. (2003). Tracking individuals via object-files: Evidence from infants' manual search. *Developmental Science*, 6, 568–584
- ²⁷ Reid, K. (2016). Counting on it: Early numeracy development and the preschool child. Australian Council for Educational Research (ACER). Retrieved from http://research.acer.edu.au/learning_processes/19
- ²⁸ Purpura, D. J., & Lonigan, C. J. (2013). Informal numeracy skills: The structure and relations among numbering, relations, and arithmetic operations in preschool. *American Educational Research Journal*, 50, 178–209.
- ²⁹ Verdine, B. N., Irwin, C. M., Golinkoff, R. M., & Hirsh-Pasek, K. (2014). Contributions of executive function and spatial skills to preschool mathematics achievement. *Journal of Experimental Child Psychology*, 126, 37–51.
- ³⁰ McClelland, M., Geldhof, J., Morrison, F., Gestsdóttir, S., Cameron, C., Bowers, E., . . . Grammer, J. (2018). Self-Regulation. In N. Halfon, C. B. Forrest, R. M. Lerner & E. M. Faustman (Eds.), *Handbook of life course health development* (pp. 275–298). Cham, Switzerland: Springer International Publishing.
- ³¹ Elliott, L., & Bachman, H. J. (2018). SES disparities in early math abilities: The contributions of parents' math cognitions, practices to support math, and math talk. *Developmental Review*.
- ³² Verdine, B. N., Golinkoff, R. M., Hirsh-Pasek, K., & Newcombe, N. S. (2014). Finding the missing piece: Blocks, puzzles, and shapes fuel school readiness. *Trends in Neuroscience and Education*, 3(1), 7–13.
- ³³ Zosh, J. M., Hirsh-Pasek, K., Hopkins, E. J., Jensen, H., Liu, C., Neale, D., . . . Whitebread, D. (2018). Accessing the inaccessible: Redefining Play as a Spectrum. *Frontiers in Psychology*, 9. doi: 10.3389/fpsyg.2018.01124
- ³⁴ Walsh, G., McGuinness, C., & Sproule, L. (2017). 'It's teaching... but not as we know it': Using participatory learning theories to resolve the dilemma of teaching in play-based practice. *Early Child Development and Care*, Advance online publication. doi: 10.1080/03004430.2017.1369977
- ³⁵ Pyle, A., & Danniels, E. (2017). A continuum of play-based learning: The role of the teacher in a play-based pedagogy and the fear of hijacking play. *Early Education & Development*, 28, 274–289. doi: 10.1080/10409289.2016.1220771
- ³⁶ Reunamo, J., Hakala, L., Saros, L., Kyhälä, A-L., Lehto, S. & Valtonen, J. (2014). Physical activity in daycare and preschool. *Early years: An International Research Journal*, 34, 32–48. doi:10.1080/00309230600622717.

- ³⁷ Moreno, A. J., Shwayder, I., & Friedman, I. D. (2017). The function of executive function: Everyday manifestations of regulated thinking in preschool settings. *Early Childhood Education Journal*, 45, 143–153.
- ³⁸ Reikerås, E., Moser, T., & Tønnessen, F. E. (2017). Mathematical skills and motor life skills in toddlers: Do differences in mathematical skills reflect differences in motor skills? *European Early Childhood Education Research Journal*, 25, 72–88. doi: 10.1080/1350293X.2015.1062664
- ³⁹ Solis, S. L., Curtis, K. N., & Hayes-Messinger, A. (2017). Children's exploration of physical phenomena during object play. *Journal of Research in Childhood Education*, 31(1), 122–140.
- ⁴⁰ Knight, S. (2009). *Forest schools and outdoor learning in the early years*. London, UK: SAGE.
- ⁴¹ Whitebread, D. (2017). Free play and children's mental health. *The Lancet Child & Adolescent Health*, 1(3), 167–169.
- ⁴² Yogman M, Garner A, Hutchinson J, et al; AAP COMMITTEE ON PSYCHOSOCIAL ASPECTS OF CHILD AND FAMILY HEALTH, AAP COUNCIL ON COMMUNICATIONS AND MEDIA. The Power of Play: A Pediatric Role in Enhancing Development in Young Children. *Pediatrics*. 2018;142(3):e20182058
- ⁴³ Reunamo, J. T., Lee, H-C., Wu, R., Wang, L-C., Mou, W-Y. & Lin, C. J. (2013). Perceiving change in role play. *European Early Childhood Education and Research Journal*, 21, 292–305.
- ⁴⁴ Ebrahim, H. B. & Francis, D. (2008). You said, 'Black girl': Doing difference in early childhood. *Africa Education Review*, 5, 274–287.
- ⁴⁵ Granger, K. (2017). Preschool teachers' facilitation of gender-typed and gender-neutral activities during free play. *Sex Roles*, 76, 498–510.
- ⁴⁶ Siraj-Blatchford, I. (2009). Conceptualising progression in the pedagogy of play and sustained shared thinking in early childhood education: A Vygotskian perspective. *Educational and Child Psychology*, 26, 77–89.
- ⁴⁷ Arvola, O., Lastikka, A-L., & Reunamo, J. (2017). Increasing immigrant children's participation in the Finnish early childhood education context. *The European Journal of Social & Behavioural Sciences*, 20, 2539–2548.
- ⁴⁸ Nicolopoulou, A., Cortina, K. S., Ilgaz, H., Cates, C. B., & de Sá, A. B. (2015). Using a narrative-and play-based activity to promote low-income preschoolers' oral language, emergent literacy, and social competence. *Early Childhood Research Quarterly*, 31, 147–162.
- ⁴⁹ Solomon, T. L. S., Plamondon, A., O'Hara, A., Finch, H., Goco, G., Chaban, P., ... & Tannock, R. (2018). A cluster randomized-controlled trial of the impact of the tools of the mind curriculum on self-regulation in Canadian preschoolers. *Frontiers in Psychology*, 8, 2366.
- ⁵⁰ Moedt, K., & Holmes, R. M. (2018). The effects of purposeful play after shared storybook readings on kindergarten children's reading comprehension, creativity, and language skills and abilities. *Early Child Development and Care*, 1–16.
- ⁵¹ Toub, T. S., Hassinger-Das, B., Nesbitt, K. T., Ilgaz, H., Weisberg, D. S., Hirsh-Pasek, K., ... & Dickinson, D. K. (2018). The language of play: Developing preschool vocabulary through play following shared book-reading. *Early Childhood Research Quarterly*, 45, 1–17.
- ⁵² Presser, A.L., Clements, M., Ginsburg, H., & Ertle, B. (2015). Big math for little kids: The effectiveness of a preschool and kindergarten mathematics curriculum. *Early Education and Development*, 26, 399–426. doi:10.1080/10409289.2015.994451
- ⁵³ Jones, E., & Reynolds, G. (2011). *The play's the thing: Teachers' roles in children's play* (2nd ed.). New York, NY: Teachers College Press.
- ⁵⁴ Yang, O. S. (2000). Guiding children's verbal plan and evaluation during free play: An application of Vygotsky's genetic epistemology to the early childhood classroom. *Early Childhood Education Journal*, 28, 3–10.

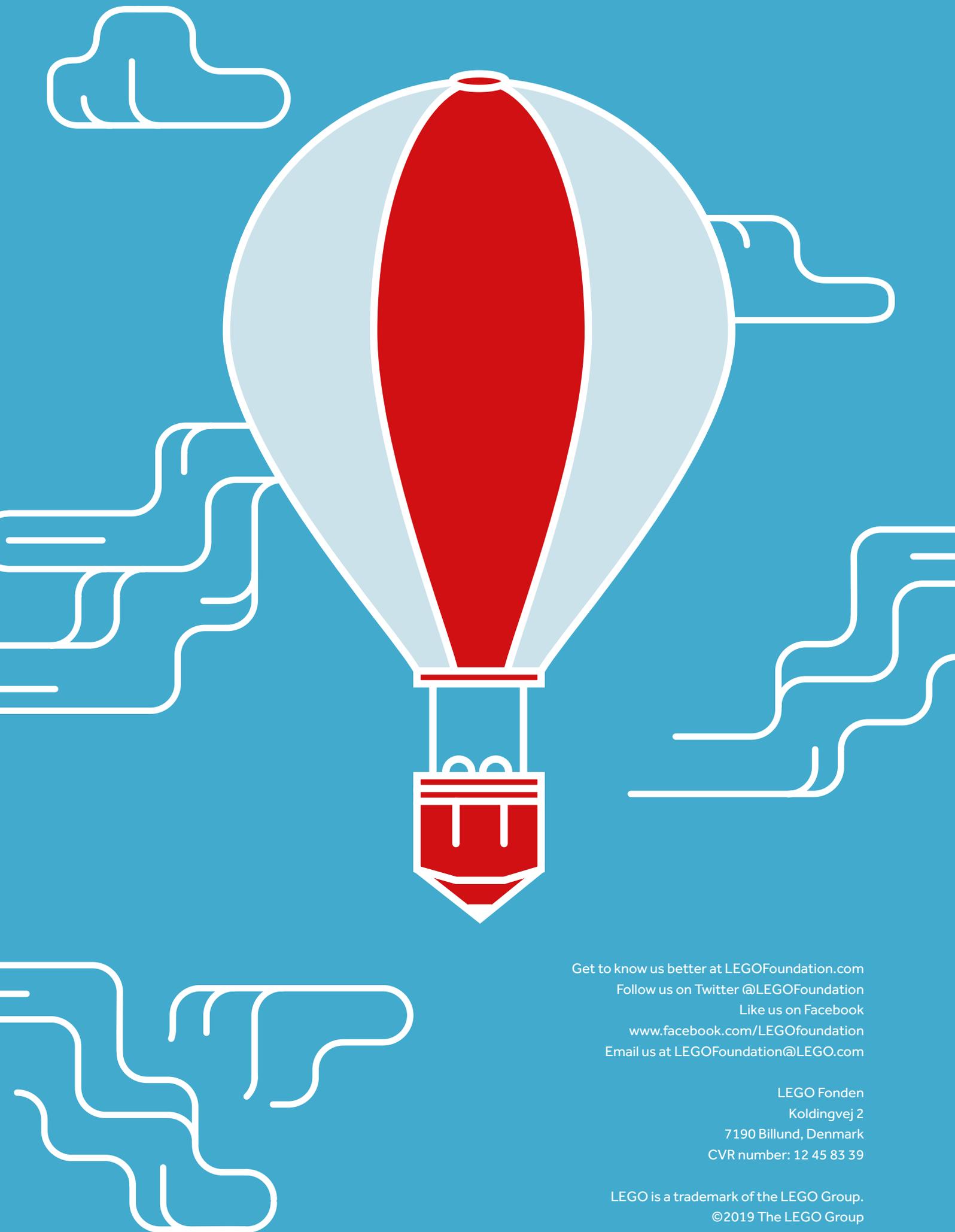
- ⁵⁵ Hassinger-Das, B., Toub, T. S., Zosh, J. M., Michnick, J., Golinkoff, R., & Hirsh-Pasek, K. (2017). More than just fun: A place for games in playful learning / Más que diversión: El lugar de los juegos reglados en el aprendizaje lúdico. *Infancia y Aprendizaje*, 40, 191–218. doi: 10.1080/02103702.2017.1292684
- ⁵⁶ Pellegrini, A. D., Kato, K., Blatchford, P., & Baines, E. (2002). A short-term longitudinal study of children's playground games across the first year of school: Implications for social competence and adjustment to school. *American Educational Research Journal*, 39, 991–1015.
- ⁵⁷ Vogt, F., Hauser, B., Stebler, R., Rechsteiner, K., & Urech, C. (2018). Learning through play–pedagogy and learning outcomes in early childhood mathematics. *European Early Childhood Education Research Journal*, 1-15.
- ⁵⁸ Ramani, G. B., & Siegler, R. S. (2008). Promoting broad and stable improvements in low-income children's numerical knowledge through playing number board games. *Child Development*, 79, 375–394.
- ⁵⁹ Hassinger-Das, B., Ridge, K., Parker, A., Golinkoff, R. M., Hirsh-Pasek, K., & Dickinson, D. K. (2016). Building vocabulary knowledge in preschoolers through shared book reading and gameplay. *Mind, Brain, and Education*, 10(2), 71-80.
- ⁶⁰ Schmitt, S. A., McClelland, M. M., Tominey, S. L., & Acock, A. C. (2015). Strengthening school readiness for Head Start children: Evaluation of a self-regulation intervention. *Early Childhood Research Quarterly*, 30, 20-31.
- ⁶¹ Bose, K. & Seetso, G. (2016). Science and mathematics teaching through local games in preschools of Botswana. *South African Journal of Childhood Education* 6, a453. doi: 10.4102/sajce.v6i2.453
- ⁶² Archer, A. L., & Hughes, C. A. (2011). *Explicit instruction: Effective and efficient teaching*. New York, NY: Guilford Press.
- ⁶³ Lee, H. S., & Anderson, J. R. (2013). Student learning: What has instruction got to do with it?. *Annual review of psychology*, 64, 445-469.
- ⁶⁴ Webb, P., Whitlow, J. W., & Venter, D. (2017). From exploratory talk to abstract reasoning: A case for far transfer?. *Educational Psychology Review*, 29(3), 565-581.
- ⁶⁵ Hamre, B. K. (2014). Teachers' daily interactions with children: An essential ingredient in effective early childhood programs. *Child Development Perspectives*, 8, 223–230.
- ⁶⁶ Castles, A., Rastle, K., & Nation, K. (2018). Ending the reading wars: Reading acquisition from novice to expert. *Psychological Science in the Public Interest*, 19(1), 5-51.
- ⁶⁷ McLeod, B. D., Sutherland, K. S., Martinez, R. G., Conroy, M. A., Snyder, P. A., & Southam-Gerow, M. A. (2017). Identifying common practice elements to improve social, emotional, and behavioral outcomes of young children in early childhood classrooms. *Prevention Science*, 18(2), 204-213.
- ⁶⁸ Bonawitz, E., Shafto, P., Gweon, H., Goodman, N. D., Spelke, E., & Schulz, L. (2011). The double-edged sword of pedagogy: Instruction limits spontaneous exploration and discovery. *Cognition*, 120(3), 322-330.
- ⁶⁹ Colliver, Y., & Arguel, A. (2018). Following in our footsteps: how adult demonstrations of literacy and numeracy can influence children's spontaneous play and improve learning outcomes. *Early Child Development and Care*, 188(8), 1093-1108.
- ⁷⁰ Halliday, S. E., Calkins, S. D., & Leerkes, E. M. (2018). Measuring preschool learning engagement in the laboratory. *Journal of experimental child psychology*, 167, 93-116.
- ⁷¹ Sawyer, J. (2017). I think I can: Preschoolers' private speech and motivation in playful versus non-playful contexts. *Early Childhood Research Quarterly*, 38, 84-96.
- ⁷² Ladd, G. W., & Dinella, L. M. (2009). Continuity and change in early school engagement: Predictive of children's achievement trajectories from first to eighth grade?. *Journal of Educational Psychology*, 101(1), 190.

- ⁷³ Bryce, C. I., Goble, P., Swanson, J., Fabes, R. A., Hanish, L. D., & Martin, C. L. (2018). Kindergarten school engagement: Linking early temperament and academic achievement at the transition to school. *Early Education and Development, 29*(5), 780–796.
- ⁷⁴ Markowitz, A. J., Bassok, D., & Hamre, B. (2018). Leveraging developmental insights to improve early childhood education. *Child Development Perspectives, 12*, 87–92. doi: 10.1111/cdep.12266
- ⁷⁵ Goble, P., & Pianta, R. C. (2017). Teacher–child interactions in free choice and teacher-directed activity settings: Prediction to school readiness. *Early Education and Development, 28*, 1035–1051.
- ⁷⁶ Reeve, J. (2012). A self-determination theory perspective on student engagement. In S. L. Christenson, A. L. Reschly & C. Wylie (Eds.), *Handbook of research on student engagement* (pp. 149–172). Boston, MA: Springer.
- ⁷⁷ Whitebread, D., & Coltman, P. (2010). Aspects of pedagogy supporting metacognition and self-regulation in mathematical learning of young children: Evidence from an observational study. *ZDM - International Journal on Mathematics Education, 42*, 163–178. doi:10.1007/s11858-009-0233-1
- ⁷⁸ Center on the Developing Child (2017). *Three Principles to Improve Outcomes for Children and Families*. Retrieved from <http://www.developingchild.harvard.edu>
- ⁷⁹ Chen, B., Vansteenkiste, M., Beyers, W., Boone, L., Deci, E. L., Deeder, J., Lens, W., Matos, L., Mouratidis, A., Ryan, R. M., Sheldon, K., Soenens, B., Petegem, S. V., & Verstuyf, J. (2015). Psychological need satisfaction and desire for need satisfaction across four cultures. *Motivation and Emotion, 39*, 216–236.
- ⁸⁰ Jang, H., Reeve, J., & Deci, E. L. (2010). Engaging students in learning activities: It is not autonomy support or structure but autonomy support and structure. *Journal of Educational Psychology, 102*, 588–600. doi: 10.1037/a0019682
- ⁸¹ Reeve, J. (2006). Teachers as facilitators: What autonomy-supportive teachers do and why their students benefit. *Elementary School Journal, 106*, 225–236.
- ⁸² Russ, S. W. (2016). Pretend play: Antecedent of adult creativity. *New Directions for Child and Adolescent Development, 2016*, 21–32. doi: 10.1002/cad.20154
- ⁸³ Capurso, M., & Ragni, B. (2016). Bridge over troubled water: Perspective connections between coping and play in children. *Frontiers in psychology, 7*, 1953.
- ⁸⁴ Slot, P. L., & Bleses, D. (2018). Individual children's interactions with teachers, peers, and tasks: The applicability of the inCLASS Pre-K in Danish preschools. *Learning and Individual Differences, 61*, 68–76.
- ⁸⁵ Cheng, P.W. D. (2010). Exploring the tactfulness of implementing play in the classroom: A Hong Kong experience. *Asia-Pacific Journal of Teacher Education, 38*, 69–82.
- ⁸⁶ Løndal, K., & Greve, A. (2015). Didactic approaches to child-managed play: Analyses of teacher's interaction styles in kindergartens and after-school programmes in Norway. *International Journal of Early Childhood, 47*, 461–479. doi: 10.1007/s13158-015-0142-0
- ⁸⁷ Ontario Ministry of Education (OME) (2016). *The Kindergarten Program 2016*. Retrieved from <https://files.ontario.ca/books/kindergarten-program-en.pdf>
- ⁸⁸ British Columbia Ministry of Education (BCME). (2016). *Curriculum*. Retrieved from: <https://curriculum.gov.bc.ca/curriculum>
- ⁸⁹ Nova Scotia Department of Education and Early Childhood (NSDEECD). (2013). *Public School Programs 2013-2014*. Retrieved from: <https://www.ednet.ns.ca/files/curriculum/PSP2013-2014-Draft-Oct16-13.pdf>
- ⁹⁰ Stagg Peterson, S., Anderson, J., Kendrick, M., McTavish, M., Budd, K., Mayer, D., McIntyre, L., Yaman Ntelioglou, B., & Riehl, D. (2016). Examining rhetorics of play in curricula in five provinces: Is play at risk in Canadian kindergartens? *Canadian Journal of Education, 39* (3), 1–26.
- ⁹¹ Canadian Teachers' Federation (2018, July 11). *Teaching in Canada. Make a difference – be the change*. Retrieved from: <https://www.ctf-fce.ca/en/Pages/TIC/BecomingaTeacher.aspx>

- ⁹² Akbari, E. & McCuaig, K. (2017). The Early Childhood Education Report 2017. Atkinson Centre for Society and Child Development, University of Toronto, CA. Retrieved from <http://ecereport.ca/media/uploads/2017-report-pdfs/ece-report2017-en-feb6.pdf>
- ⁹³ Pyle, A., Poliszczuk, D., & Danniels, E. (2018). The challenges of promoting literacy integration within a play-based learning kindergarten program: Teacher perspectives and implementation. *Journal of Research in Childhood Education*, 32, 219–233. doi: 10.1080/02568543.2017.1416006
- ⁹⁴ Danish Childcare Legislation (Dagtilbudsloven) of May 29, 2018. Retrieved from <https://www.retsinformation.dk/Forms/R0710.aspx?id=201526>
- ⁹⁵ Danmarks Statistik (2017). Normeringer i institutioner og dagpleje. Retrieved from <https://www.dst.dk/da/Statistik/emner/levelilkaar/boernepasning/boern-og-personale>
- ⁹⁶ Socialministeriet [Danish Ministry for Social Affairs], Velfærdspolitisk Analyse nr. 16, juli 2018. Retrieved from <https://socialministeriet.dk/media/19210/velfaerdspolitisk-analyse-personale-i-daginstitutioner-normering-og-uddannelsedocx.pdf>
- ⁹⁷ Bauchmüller, R., Gørtz, M., & Rasmussen, A. W. (2014). Long-run benefits from universal high-quality preschooling. *Early Childhood Research Quarterly*, 29, 457–470. doi: 10.1016/j.ecresq.2014.05.009
- ⁹⁸ Jensen, B. (2009). A Nordic approach to Early Childhood Education (ECE) and socially endangered children. *European Early Childhood Education Research Journal*, 17, 7–21. doi: 10.1080/13502930802688980
- ⁹⁹ Bleses, D., Højen, A., Dale, P. S., Justice, L. M., Dybdal, L., Piasta, S., ... Haghish, E. F. (2018). Effective language and literacy instruction: Evaluating the importance of scripting and group size components. *Early Childhood Research Quarterly*, 42, 256–269. doi: 10.1016/j.ecresq.2017.10.002
- ¹⁰⁰ Finnish National Institute for Health and Welfare. (2017). Tilastoraportti Varhaiskasvatus 2016 [Statistics report Early Childhood Education]. (Report 29/2017). Retrieved from <https://www.julkari.fi/handle/10024/135183>.
- ¹⁰¹ Finnish National Agency for Education. (2016). National core curriculum for early childhood education and care. Retrieved from http://www.oph.fi/download/179349_varhaiskasvatussuunnitelman_perusteet_2016.pdf
- ¹⁰² Kumpulainen, K. (2018). A Principled, Personalized, Trusting, and Child-Centric ECEC System in Finland. The Early Advantage 1—Early Childhood Systems That Lead by Example: A Comparative Focus on International Early Childhood Education, 72.
- ¹⁰³ ORIENTATION PROJECT. Early Education Research and Development (<http://blogs.helsinki.fi/orientate/>)
- ¹⁰⁴ DBE. (2015). The South African National Curriculum Framework for children from Birth to Four. Pretoria.
- ¹⁰⁵ DBE. (2011). Curriculum and Assessment Policy Statement Grades R-3. English Home Language. Pretoria.
- ¹⁰⁶ Foundation for Community Work & Department of Social Development. (2011). Standard operating procedures. Registration and funding of partial care facilities. Cape Town: Foundation for Community Work.
- ¹⁰⁷ Spaul, N. (2016). Class sizes in the Foundation Phase. Stellenbosch, South Africa: Economic Policy Unit.
- ¹⁰⁸ Richter, L., & Samuels, M. L. (2018). The South African universal preschool year: a case study of policy development and implementation. *Child: care, health and development*, 44(1), 12–18.
- ¹⁰⁹ Bassok, D., Fitzpatrick, M., Greenberg, E., & Loeb, S. (2016). Within- and between-sector quality differences in early childhood education and care. *Child Development*, 87, 1627–1645.
- ¹¹⁰ Hamre, B. Markowitz, A., Sadowski, K., & Bassok, D. (2018). Teacher education and the quality of teacher-child interactions across early childhood sectors in Louisiana. Manuscript submitted for publication.
- ¹¹¹ Chien, N. C., Howes, C., Burchinal, M., Pianta, R. C., Ritchie, S., Bryant, D. M., ... & Barbarin, O. A. (2010). Children's classroom engagement and school readiness gains in prekindergarten. *Child Development*, 81, 1534–1549.

- ¹¹² Fuligni, A. S., Howes, C., Huang, Y., Hong, S. S., & Lara-Cinisomo, S. (2012). Activity settings and daily routines in preschool classrooms: Diverse experiences in early learning settings for low-income children. *Early Childhood Research Quarterly*, 27, 198–209.
- ¹¹³ Bassok, D., Finch, J. E., Lee, R., Reardon, S. F., & Waldfogel, J. (2016). Socioeconomic gaps in early childhood experiences: 1998 to 2010. *AERA Open*, 2, 2332858416653924. doi: 10.1177/2332858416653924
- ¹¹⁴ INEE. (2014). El derecho a una educación de calidad. Informe 2014. [The right to quality education. 2014 Report]. Retrieved from <http://publicaciones.inee.edu.mx/buscadorPub/P1/D/239/P1D239.pdf>
- ¹¹⁵ SEP. (2016). El modelo educativo 2016. El planteamiento pedagógico de la reforma educativa. [The educational model 2016. The pedagogical underpinning of the educational reform]. Retrieved from https://www.gob.mx/cms/uploads/attachment/file/118382/El_Modelo_Educativo_2016.pdf
- ¹¹⁶ SEP. (2017). Aprendizajes clave para la educación integral. Educación preescolar. Plan y programas de estudio, orientaciones didácticas y sugerencias de evaluación. [Key learnings for an integral education. Preschool education. Plan and study programs, didactic approaches and suggestions for evaluation]. Retrieved from <http://www.aprendizajesclave.sep.gob.mx/descargables/biblioteca/preescolar/1LpM-Preescolar-DIGITAL.pdf>
- ¹¹⁷ INEE (2015). Los docentes en México. Informe 2015. México: INEE.
- ¹¹⁸ INEE. (2013). Prácticas pedagógicas y desarrollo profesional docente en preescolar [Pedagogical practices and professional development of preschool teachers]. Retrieved from <http://publicaciones.inee.edu.mx/buscadorPub/P1/D/240/P1D240.pdf>
- ¹¹⁹ Hu, B. Y., Li, K., De Marco, A., & Chen, Y. (2015). Examining the quality of outdoor play in Chinese kindergartens. *International Journal of Early Childhood*, 47, 53–77.
- ¹²⁰ Hu, B. Y., & Szente, J. (2009). Exploring the quality of early childhood education in China: Implications for early childhood teacher education. *Journal of Early Childhood Teacher Education*, 30, 247–262.
- ¹²¹ Li, H., Wang, X. C., & Wong, J. M. S. (2011). Early childhood curriculum reform in China: Perspectives from examining teachers' beliefs and practices in Chinese literacy teaching. *Chinese Education & Society*, 44, 5–23.
- ¹²² Zhao, L., & Hu, X. (2008). The development of early childhood education in rural areas in China. *Early Years*, 28, 197–209. doi: 10.1080/09575140802079756
- ¹²³ Qi, X., & Melhuish, E. C. (2017). Early childhood education and care in China: History, current trends and challenges. *Early Years*, 37, 268–284.
- ¹²⁴ Hu, B. Y., Mak, M. C. K., Neitzel, J., Li, K., & Fan, X. (2016). Predictors of Chinese early childhood program quality: Implications for policies. *Children and Youth Services Review*, 70, 152–162.
- ¹²⁵ Hu, B. Y., Fan, X., LoCasale-Crouch, J., Chen, L., & Yang, N. (2016). Profiles of teacher-child interactions in Chinese kindergarten classrooms and the associated teacher and program features. *Early Childhood Research Quarterly*, 37, 58–68. doi: 10.1016/j.ecresq.2016.04.002
- ¹²⁶ Wu, S.-C., Faas, S., & Geiger, S. (2018). Chinese and German teachers' and parents' conceptions of learning at play – similarities, differences, and (in)consistencies. *European Early Childhood Education Research Journal*, 26, 229–245. doi: 10.1080/1350293X.2018.1442034
- ¹²⁷ Yang, Y., Hu, B. Y., Yu, S., Roberts, S. K., & Leong, S. S. L. (2018). A qualitative case study of instructional support practices in Chinese preschool classrooms. *Learning, Culture and Social Interaction*. Advance online publication. doi: 10.1016/j.lcsi.2018.03.003
- ¹²⁸ Liu, C., & Tobin, J. (2018). Group exercise in Chinese preschools in an era of child-centered pedagogy. *Comparative Education Review*, 2, 5–30. doi: 10.1086/695486
- ¹²⁹ Qi, X., & Melhuish, E. C. (2017). Early childhood education and care in China: History, current trends and challenges. *Early Years*, 37, 268–284.
- ¹²⁹ Hegde, A. V., & Cassidy, D. J. (2009). Kindergarten teachers' perspectives on developmentally appropriate practices (DAP): A study conducted in Mumbai (India). *Journal of Research in Childhood Education*, 23, 367–381.

- ¹³⁰ Reeve, J., Jang, H. R., & Jang, H. (2018). Personality-based antecedents of teachers' autonomy-supportive and controlling motivating styles. *Learning and Individual Differences*, 62, 12–22. doi: 10.1016/j.lindif.2018.01.001
- ¹³¹ Pyle, A., & DeLuca, C. (2017). Assessment in play-based kindergarten classrooms: An empirical study of teacher perspectives and practices. *The Journal of Educational Research*, 110, 457–466.
- ¹³² Pyle, A., DeLuca, C., & Danniels, E. (2017). A scoping review of research on play based pedagogies in kindergarten education. *Review of Education*, 5(3), 311–351.
- ¹³³ Litjens, I., & Taguma, M. (2010). Network on early childhood education and care: Revised literature overview for the 7th meeting of the network on early childhood education and care. Paris: OECD.
- ¹³⁴ Ryan, S., & Northey-Berg, K. (2014). Professional preparation for a pedagogy of play in Brooker, E., Blaise, M., & Edwards, S. (Eds.). *The SAGE handbook of play and learning in early childhood*. 204–215.
- ¹³⁵ Zaslow, M., Burchinal, M., Tarullo, L., & Martínez-Beck, I. (2016). V. Quality, thresholds, features, and dosage in early care and education: Discussion and conclusions. *Monographs of the Society for Research in Child Development*, 81, 75–87. doi: 10.1111/mono.12240
- ¹³⁶ Burchinal, M. (2018). Measuring early care and education quality. *Child Development Perspectives*, 12, 3–9. doi: 10.1111/cdep.12260
- ¹³⁷ Sim, M., Bélanger, J., Hocking, L., Dimova, S., Iakovidou, E., Janta, B., & Teager, W. (August 2018). Teaching, pedagogy and practice in early years childcare: An evidence review. RAND Europe and Early Intervention Foundation.
- ¹³⁸ Nores, M., Figueras-Daniel, A., Lopez, M. A., & Bernal, R. (2018). Implementing aeioTU: Quality improvement alongside an efficacy study-learning while growing. *Annals of the New York Academy of Sciences*, 1419, 201–217. doi: 10.1111/nyas.13662
- ¹³⁹ Weiland, C., McCormick, M., Mattera, S., Maier, M., & Morris, P. (2018). Preschool curricula and professional development features for getting to high-quality implementation at scale: A comparative review across five trials. *AERA Open*, 4, 2332858418757735.
- ¹⁴⁰ Markowitz, A. J., Bassok, D., & Hamre, B. (2018). Leveraging developmental insights to improve early childhood education. *Child Development Perspectives*, 12(2), 87–92.
- ¹⁴¹ McGuinness, C., Sproule, L., Bojke, C., Trew, K., & Walsh, G. (2014). Impact of a play-based curriculum in the first two years of primary school: Literacy and numeracy outcomes over seven years. *British Educational Research Journal*, 40, 772–795. doi: 10.1002/berj.3117
- ¹⁴² Friendly, M., Ferns, C., & Prabhu, N. (2009). Ratios for four- and five-year olds: What does the research say? What else is important? Childcare Resource and Research Unit. Retrieved from: <http://www.childcarecanada.org/documents/research-policy-practice/14/09/ratios-four-and-five-year-olds-what-does-research-say-what->
- ¹⁴³ Perlman, M., Fletcher, B., Falenchuk, O., Brunsek, A., McMullen, E., & Shah, P. S. (2017). Child-Staff ratios in early childhood education and care settings and child outcomes: A systematic review and meta-analysis. *PloS one*, 12(1), e0170256.
- ¹⁴⁴ OECD (2017), *Starting Strong 2017: Key OECD Indicators on Early Childhood Education and Care*, Starting Strong, OECD Publishing, Paris, <https://doi.org/10.1787/9789264276116-en>.



Get to know us better at LEGOFoundation.com

Follow us on Twitter @LEGOFoundation

Like us on Facebook

www.facebook.com/LEGOfoundation

Email us at LEGOFoundation@LEGO.com

LEGO Fonden

Koldingvej 2

7190 Billund, Denmark

CVR number: 12 45 83 39

LEGO is a trademark of the LEGO Group.

©2019 The LEGO Group