

## Chapter 64

# Making the Case for Playful Learning

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*Children learn as they play. Most importantly, in play children  
learn how to learn. – O. Fred Donaldson*

**Abstract** Play is one of the natural strengths of childhood through which children acquire and also practice critical language, cognitive, and socio-cognitive abilities. This long-standing belief has widely shaped curriculum in early childhood, mainly in the form allotting time and space for free play. However, lately the effectiveness of play for early childhood development and consequently its place in the early childhood curriculum are under attack especially in the USA. Policy makers are substituting playtime with didactic instruction aimed at imparting decoding skills that speak to a narrow set of literacy and school readiness skills. Their decision to make the early childhood classroom a more didactic, adult-directed teaching environment is seemingly supported with recent reviews of play research that show minimal or inconsistent effects. We propose that playful learning deserves careful consideration before we discard play as a learning and instruction strategy. In this chapter, we review some of the newly emerging evidence for the effectiveness of *guided play*, a form of play that is situated on a continuum between adult-directed didactic instruction and child-directed free play. In the light of reviewed evidence, we propose that playful learning should be implemented to target specific learning objectives such as numeracy, vocabulary, narrative competence, and knowledge of science concepts. We discuss the need for comprehensive playful learning programs

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that complement free play and didactic programs. Finally, we emphasize the need to share playful learning techniques with educators that will enable them to integrate curricular objects in playful learning activities.

**Keywords** Guided play • Early childhood education • Cognitive development

In the USA, 23% of children are growing up in poverty with little access to age-appropriate books or games that support language or early mathematics knowledge (Kids Count Data Center 2013). Without a strong early education in these areas, these children will be at a disadvantage. However, many studies have shown that rich curricula improve preschool children's later academic outcomes, particularly in the areas of literacy, mathematics, and school readiness (Campbell et al. 2001, 2002; Campbell and Ramey 1994; Reynolds et al. 2004; Schweinhart 2004; Weikart 1998). As such, we not only know that early education matters, but research is narrowing in on exactly the kinds of curricula that will align preschool education with later school success. Yet curriculum is but one part of the puzzle; the other part, of equal importance, is how the curriculum is delivered. Without effective pedagogical approaches, even the best curriculum can fail.

Many early education curricular and assessment approaches have focused on directly presenting content without addressing the need for innovative and responsive pedagogy (Miller and Almon 2009). In this chapter, we question whether the default pedagogical option should be didactic instruction measured solely by standardized assessments. We consider those factors that lead to “effective” early childhood education. Our skepticism is not a matter of preference or as a result of an aversion to “didactic” or “traditional” teaching methods (Bowman 1999). We offer an alternative pedagogical approach in the form of guided play—a type of play that is child centered but is situated on a continuum between adult-directed didactic instruction and child-directed free play (also see, Toub et al. 2016; Weisberg et al. 2013a, b; Weisberg et al. 2016). The construct of guided play offers the opportunity for a rich curriculum delivered through a playful learning experience that features a whole-child approach and utilizes child-centered instruction. In fact, guided play has been shown to promote the same academic outcomes, including language skills and school readiness, as a strong preschool curriculum (e.g., Hirsh-Pasek et al. 2009; Roskos and Christie 2001; Fisher et al. 2011). Here, we review the emerging evidence for the effectiveness of guided play. In light of this evidence, we propose that playful learning in the context of guided play should be given careful consideration as a pedagogy that complements both preschool curricula and free play.

## 64.1 The Face of Early Education and Assessment in the USA

The image of the preschool classroom that Americans have in their minds has changed drastically in recent years. A classroom full of young children where there is happy chaos during play time and where children test which objects float in water or pretend to write down orders in the house corner for peers pretending to be restaurant patrons is now becoming a thing of the past. The 2009 Alliance for Childhood report (Miller and Almon 2009), based on a survey of 200 kindergarten classrooms in New York and Los Angeles, found that 25% of the teachers in Los Angeles reported having no time for play in their classrooms. Perhaps even more worrisome is the report's finding that young children had, on average, less than 30 min a day for play in the New York classrooms and less than 20 min in Los Angeles. What is replacing the time opened up by eliminating play? Individual work with a teacher on standardized test taking! Providing quantitative evidence for this disconcerting fact is the report's finding that 80% of teachers from both cities clear time in their daily classroom schedules for test preparation. These findings are consistent with Elkind's (2008) claim that children have lost up to 8 h a day of free-play time over the last two decades and that thousands of schools in the USA have given up recess time to ensure that children have more time for academic study. This reduction in playtime is a barometer for a much deeper debate in our society about the value of play in children's lives. In short, early childhood classrooms are looking more and more like grade school every year.

This radical change that has so profoundly altered the image of the typical preschool and kindergarten classroom was ushered in by the No Child Left Behind Act (NCLB), which promoted one message loud and clear: the need to modify the way that we have been viewing the effectiveness of education. Though early education was not targeted in NCLB, it was caught up in the wave of change. Effective early childhood education needs to produce children who know their letters and numbers so that they are ready for formal schooling by age 5 or 6. Effectiveness has thus become a criterion through which parents can understand whether or not their children's teachers are actually succeeding in teaching children the necessary information to facilitate school readiness and later school success. Perhaps most worrying is that this view has emphasized the active nature of teaching while downplaying the active nature of learning. Teaching is being redefined as the ability of the teachers to pour information into the empty vessels of the young rather than inspiring learning through discovery (Hirsh-Pasek and Golinkoff 2003).

Ironically, research suggests that a focus on child-centered pedagogies is effective for improving educational outcomes (Campbell et al. 2002; Montie et al. 2006) and that the renewed emphasis on didactic instruction to improve test scores at earlier ages has not resulted in improved academic and socio-emotional readiness skills (Schweinhart and Weikart 1997). Particularly, in an analysis of 6 longitudinal data sets, Grissmer et al. (2010) found that the combination of attention, fine motor skills, and general knowledge of the social and physical world was a better predictor

of later mathematics, reading, and science scores than kindergarten reading and mathematics scores.

It also does not appear that NCLB has had the intended effects on later school outcomes. The first crop of students who experienced all of their formal schooling during the NCLB era would be reflected in the international test scores that were reported in 2009. The 2009 Programme for International Student Assessment (PISA) found that 70% of 15-year-olds in the USA read at level 3 proficiency or lower, meaning they did not display advanced reading abilities that involve extracting, interpreting, and synthesizing information from texts that do not rely on common knowledge (OECD 2010). The same study found that the USA ranked 30th among industrialized countries in math proficiency and 23rd in science. This grave picture coupled with the fact that children from low socioeconomic backgrounds are more likely to score below the average on both US and international proficiency levels shows us that the way we have been approaching the education problem is not providing solid results.

More than a decade after the NCLB act was passed, a different US president faced many of the same challenges, including persistent achievement gaps between American children and children from other countries, as well as the gaps between American children from different socioeconomic backgrounds (IES National Center for Education Statistics 2011; OECD 2010). In this climate of educational urgency, President Obama (2009) introduced the Race to the Top Initiative with a speech that focused on “raising the bar in early childhood education” and emphasized that “success should be judged by results and data is a powerful tool to determine results.” The common threads between NCLB and Race to the Top seem to be the emphasis on knowledge as commodity, and that educational institutions should be held accountable for providing the type of education that prepares the American child to compete and succeed in a competitive world. Although these initiatives are focused on K-12 education, many of the core principles trickled down to the early childhood education community. The rationale is straightforward and at this point all too familiar: teachers should be held accountable; accountability should be judged by data; and children’s performance on standardized assessments will provide policy makers and parents with the data to judge the effectiveness of their children’s education.

The positive in this grim picture is that initiatives like the NCLB, Race to the Top, and the Common Core State Standards (Common Core State Standards Initiative 2010) shone the spotlight on education in general and early education in particular. Today, there is also renewed emphasis in the USA on the promise of early education (Heckman 2011; Obama 2009). The question on the table is not whether participation in formal early childhood programs has both short- and long-term benefits on children’s school readiness and success; a plethora of research tells us that it does (e.g., Campbell et al. 2001, 2002; Campbell and Ramey 1994; Justice et al. 2008; Schweinhart 2004; Weikart 1998; Reynolds et al. 2004). The question is also not whether early language, math, and science skills contribute to school readiness or success; the research is clear that they do (Duncan et al. 2007; NICHD Early Childcare Research Network 2005; Whitehurst and Lonigan 1998). The question is

whether we can have strong curricular goals that are taught using developmentally sensitive and developmentally appropriate methods. And here too, there is a strong suggestion that this is possible (Hirsh-Pasek and Golinkoff 2011; Zigler et al. 2004). Indeed, research from Montessori schools (Lillard and Else-Quest 2006; Lillard 2012) along from anecdotal evidence from popular schooling methods like Reggio Emilia (e.g., Edwards et al. 1998) offer preliminary evidence that we can have a content-rich curriculum within a more playful and developmentally appropriate pedagogy.

Our concern is that the view of didactic instruction as educational effectiveness is at odds with what we know about how young children learn. Conceptually, our argument is based on the seven principles of a whole-child approach (for detailed discussion of these principles, see Hirsh-Pasek et al. 2009). These principles paint a picture of an active learner who gains new information and ways of understanding the world through participation in social and responsive learning situations. These young learners are most successful when the learning situation is sensitive and responsive to their social and emotional needs. Within this framework, early childhood education is most successful when it targets the whole child promoting essential life skills such as self-regulation, flexibility, and creative thinking, as well as curricular goals that will feed into school readiness and later school success. We argue that only holistic pedagogies that emphasize children becoming active seekers and learners of knowledge will produce what the policies of the past decade have actually been striving for: learners who know how to seek and integrate information and learners who can find solutions to novel problems.

Under the guidance of these principles and based on mounting evidence, we propose that guided play is a developmentally sensitive and developmentally appropriate pedagogy that needs to be brought to the forefront in child education. We support our argument with evidence from studies that have examined the effects of guided play on children's school readiness abilities such as literacy, language, math, and science, as well as important life skills such as self-regulation.

## 64.2 Guided Play: A Developmentally Appropriate Learning Context

Most scientists agree that play activities are fun, voluntary, flexible, have no extrinsic goals, involve active engagement of the child, often with an element of make-believe (Johnson et al. 1999; Pellegrini 2009; Sutton-Smith 2001; Fisher et al. 2011). In their review of the literature on pretend play and learning, Lillard et al. (2013) add positive affect, nonliterality, and intrinsic motivation to the mix (see also Bateson 1972; Garvey 1977; Sutton-Smith and Kelly-Byrne 1984).

This definition of free play provides a good starting point for our explanation of guided play. The two defining features of free play are that it is child-initiated and child-directed. Free play is child-initiated in the sense that it emerges spontaneously

and is based on children's will. It is child-directed in the sense that children have full control over the topic of play, the roles of self and others, and the implicit rules and conditions of play. For instance, at the water table children may choose to experiment with different containers to see which one holds more liquid, or they can engage in make-believe and pretend to make lemonade. Importantly, the play may change in nature over a brief span of time, where children pretending to make lemonade may start experimenting with the containers or children who were busy trying to solve the shape-volume issue may start pretending that they are selling lemonade at a stand. Children engage in exploration and discovery learning in free play where they actively manipulate objects or try out social roles and practice their narrative abilities without adult-imposed constraints and learning objectives (Pellegrini 2009). Free play also provides children with a medium to develop socio-emotional abilities (see Pagani et al. 2010; Romano et al. 2010; Singer and Singer 1990).

The debate is not whether children benefit from free play, but whether free play supports learning objectives or promotes school readiness. Two studies suggest that free play, alone, may not be powerful enough to prepare children for these standards. Chien et al. (2010) observed 2,751 children in 701 state-funded preschool classrooms from 11 states across the country to identify patterns of children's classroom engagement. They also investigated whether these patterns were differentially related to gains in school readiness. Their analysis revealed four different engagement patterns: free play, large or small group instruction, individual instruction, and scaffolded learning contexts. The first three of these patterns are clearly identified in the classroom setting and schedule. The fourth pattern is one that is based on the nature of children's interaction with others. In the scaffolded learning contexts, children were observed in interaction with their teachers or a more capable peer where they engaged in learning as a response to contingent support that helped to extend children's understanding and knowledge. A striking result of the study was that children who were observed spending the most time in free play made the smallest gains in language, literacy, and math measures across the academic year. There were no differences in the gains children made based on the other three engagement patterns with the exception of children in the individual instruction group outperforming all other groups on Woodcock-Johnson Applied Problems subtest.

Another piece of evidence comes from a meta-analysis on 164 studies that examined the effects of unassisted discovery learning, enhanced discovery learning, or explicit instruction with children and adults (Alfieri et al. 2010). Unassisted discovery typically involved working alone or with a naïve peer on a problem with novel material. Enhanced discovery learning typically involved interactive problem-solving contexts where learning was supported through questions and supportive comments that served to guide participants' reasoning and learning. In the explicit instruction condition, participants were provided information through didactic methodologies such as lectures and presentations or demonstrations. The results are telling. Enhanced discovery learning conditions were found to be more effective than explicit instruction and unassisted discovery contexts.

Taken together, these two findings indicate that when it comes to targeted learning goals, unassisted learning contexts are not effective in producing specific

learning outcomes. This conclusion is also supported by Chi's work (2009). Chi argues that, particularly for young children, learning that is active, constructive but also interactive, will yield the best learning results. Do these results then justify eliminating playtime and replacing it with more didactic forms of instruction? To the contrary, in our view, the stated research also provides compelling evidence to consider a different type of play activity that can allow children to explore and lead in their learning while receiving contingent support: guided play.

Guided play is a middle ground between free play and direct instruction (Weisberg et al. 2013a, b). It combines the enjoyable and empowering nature of play with developmentally appropriate and scaffolded instruction. Guided play is essentially a child-directed activity where children lead the play and guide their own learning and discovery within a framework of careful adult guidance. In this type of play, adults support and subtly guide children's learning through setting up the learning environment, commenting on the play, asking questions that encourage deeper thinking, discovery, and reflection (Ash and Wells 2006; Berk and Winsler 1995; Callanan and Braswell 2006; Callanan and Oakes 1992; Copple et al. 1979; Rogoff 2003).

Guided play can be initiated by children and supported by adults as when an adult seizes the opportunity and enters an ongoing play context. For instance, upon seeing two children building castles with blocks, the teacher may participate in the play and subtly probe for learning objectives such as mathematical concepts (e.g., How many blocks do we need to make another tower? Which castle is taller? What would happen if we took one block away?), vocabulary (e.g., Who lives in castles? Can we build a turret on this tower?), or social sciences (e.g., Why do you think kings and queens used to live in castles? Couldn't they live in houses or apartments like we do?). Teachers may also craft a play activity with a careful plan that targets learning objectives such as a providing theme-related toy sets that support the use of new vocabulary or providing irregularly shaped blocks to build a house which yields rich talk about shapes. In this case, the adult structures the environment that allows children to initiate play that will foster learning.

The roles of both the adult and the children are very different from those in free play and direct instruction. In free play, teachers typically assume the role of a bystander/observer who intervenes during times of crisis such as when children cannot resolve conflicts on their own. For direct instruction, the role of the teacher is that of the director who provides explicit instruction. In contrast to both of these roles, in guided play the adult takes the role of a coach that observes children's learning and intervenes subtly to scaffold children's thinking and reflection of the new information all the while taking a playful stance. In stark contrast to free play, the teacher shares the play context with the children, taking on a role, participating in the play, and is careful to maintain the light and fun atmosphere. In guided play, teachers follow children's lead but have a learning goal in mind.

To illustrate, imagine three teachers who all taught new farm-themed vocabulary words during story time. All teachers added some props and toys such as farming tools, flower pots, seeds, and plastic flowers to their house corner that might facilitate use of these new vocabulary words. The teachers who take a free-play approach

invite the children to play at the house corner but would only enter children's play if they experienced a problem and would otherwise stay on the sidelines to let children experiment with the new words on their own. The teacher who takes a didactic approach would provide adult-centered and adult-directed instruction about the words if she ever entered the children's house corner. She might ask children to name the different flowers and show her how to use a rake.

In contrast, the teacher who takes a guided play approach would enter their play as a play partner. For example, she might ask if the farmer needs help before joining in. She would then ask questions that prompt children to think deeply about the new words as they play: "I can't find the rake, do you think a shovel will work to pick the leaves?" Depending on how children answered, she might even follow up with open-ended questions that get children to talk like, "Why not?" This example illustrates that guided play is fundamentally a scaffolded activity in the spirit of the Piagetian and Vygotskian schools of child development, following children's lead while at the same time exposing them to richer curricular concepts. Guided play is also compatible with new conceptualizations of effective learning contexts as including assisted discovery and children's own activity (e.g., Chi 2009; Honomichl and Chen 2012).

The role of children in guided play is similar to that in free play. True to the core definition of play, children are expected to take ownership of the play context and lead the play. This is in direct contrast to the direct instruction pedagogy where children are passive recipients of information. In guided play, children have to actively construct the play scene in collaboration with peers. Children's ownership of play is one of the critical elements of the guided play approach as it ensures that the play context is meaningful and interesting for children.

### **64.3 Guided Play: The Evidence**

Studies that directly investigate the effectiveness of guided play on academic outcomes are sparse, but there is enough evidence to guide research programs. In the following sections, we provide a brief overview of studies that present us with the relevant evidence.

### **64.4 Language, Literacy, and Guided Play**

Studies that have focused on structuring the play environment in the classroom in order to enhance children's literacy-related play have generally shown positive effects (Christie and Enz 1992; Christie and Roskos 2006). By way of example, Neuman and Roskos (1992) investigated whether the incorporation of literacy props in the dramatic play, library, and other centers increased literacy-related activities compared to a control group. Children in the intervention group interacted with the

literacy materials significantly more than children in the control group, and they also engaged in longer and more complex literacy-related activities than the children in the control group.

Structuring the play environment to provide children with materials that will enhance their learning of curricular objectives is only one component of guided play. Another essential component is the developmentally sensitive support and guidance provided by the adult or more capable peers. Research by Morrow and Rand (1991) provide some evidence that the combination of structuring the play environment combined with sensitive support leads to higher levels of literacy-related play. In this study, the authors randomly assigned 170 preschool and pre-K children from 13 classrooms in one of four conditions. In the guided play-literacy condition, literacy-related materials such as magazines, books, pens, and papers were introduced to the block corner and the dramatic play center. In the guided play-thematic play condition, dramatic play centers were enriched with thematic materials (e.g., veterinarian's office with pet-themed magazines, nurse's station). In the free play with thematic materials condition, the same thematic setup was offered without adult guidance. Finally, traditional curriculum play centers resumed their business-as-usual style. Adult guidance in the literacy condition took the form of reminding children to use the new materials in their play, but also importantly included modeling of the desired behavior by the teacher. This study showed that children in the two guided play conditions engaged in more literacy activities. They also engaged in more complex literacy behavior such as pretending to read and write. This study provides evidence that the combination of organizing the environment to target curricular goals and providing guidance during play is a powerful combination in increasing children's engagement with curricular activities in a play setting.

Another line of inquiry asks if guided play can be used to promote oral language abilities. Oral language abilities lay the foundation for literacy abilities that prepare children for school readiness. Importantly, oral language abilities have long-term and pervasive effects on later school success (e.g., Dickinson et al. 2010). Two aspects of oral language have been studied with guided play techniques: vocabulary acquisition and narrative development.

Several studies have used guided play techniques to complement other literacy activities in the classroom such as story time (e.g., Han et al. 2010; Roskos and Burnstein 2011; Vukelich et al. 2009). For example, Han et al. (2010) investigated whether a book reading and guided play intervention could increase vocabulary scores of at-risk Head Start children whose scores on the Peabody Picture Vocabulary Test were one standard deviation below age norms. All children participated in interactive book readings that targeted new vocabulary words for 30 min, twice a week for 2 months. The treatment group received book reading for 20 min followed by 10 min of guided play with book-related props. Children in the control group engaged in 30 min of interactive book reading without guided play. While children in both groups showed gains in their expressive vocabulary, the group who had received the play intervention showed significantly more gains than children in the no-play group. This study illustrates that guided play can be used with very specific

learning objectives (i.e., learning specific vocabulary words) and can complement existing literacy activities in the classroom to support children's oral language abilities.

Play interventions that target narrative abilities have been around since the 1970s. These interventions typically take two forms: thematic-fantasy play where children enact stories that are read to them during story time and storytelling and story-acting activities where children author their own stories and later enact them with friends (for reviews, see Mages 2008; Nicolopoulou and Ilgaz 2014; Pellegrini and Galda 1993; Rowe 1998). Thematic-fantasy play research has systematically tested whether adult guidance matters in children's narrative gains. In a study that compared adult guidance with peer guidance, Pellegrini (1984) found that younger children (preschoolers) benefited from adult guidance significantly more in terms of story comprehension, whereas older children (kindergarteners) benefited equally from adult and peer guidance. Guided play seems to help children especially when the task at hand is challenging. To illustrate this point, Silvern et al. (1986) investigated the effects of varying degrees of adult support (directive vs. facilitative) and story difficulty (familiar vs. unfamiliar fairy tales) on preschoolers' narrative comprehension abilities. Echoing Pellegrini's (1984) findings, they found that children's age and degree of adult support interact differentially based on story familiarity. Younger children benefited more from stronger adult scaffolding in making sense of the story regardless of story familiarity, while older children benefited from this type of support with unfamiliar stories. Further, when the story does not pose a challenge (familiar stories), older children benefited equally from opportunities to co-construct the story with peers or adults. These two studies collectively show that guided play that is sensitive to children's developmental levels can have potentially long lasting effects on critical oral language and school readiness abilities.

Another type of guided play activity involves adaptations of Paley's (1990) storytelling and story-acting activity. These adaptations involve true integration of guided play and playful learning principles as they are adult-structured, child-centered, and child-directed activities (e.g., Nicolopoulou 2002; Nicolopoulou and Richner 2004). This activity generally involves encouraging children to tell stories to their teacher at free-play time. The teacher writes the stories down in a class storybook, taking care not to direct or shape children's stories. Later, during circle time the story is read to the whole group, and the author of the story is asked to invite friends to act in the story. The children have full ownership of their stories both during the process of composing the story and during enactment. In one such study, Nicolopoulou et al. (2006) found that Head Start preschool children who engaged in this activity created longer stories with more complex storylines.

In sum, research that looks at the effect of guided play on children's language and literacy abilities shows gains in children's literacy-related behavior, literacy knowledge, and oral language abilities. This line of research as indicated by Lillard et al. (2013) shows one of the strongest relations between play and curricular outcomes. However, as Lillard and colleagues also caution, this body of work is not without methodological problems and requires rigorous studies that investigate this relationship (see Nicolopoulou and Ilgaz 2014 for further discussion). Nevertheless,

this research provides a solid starting point for devising playful activities for children that target specific literacy-related curricular goals.

## 64.5 Mathematics and Guided Play

In the area of mathematics, guided play helps children become competent problem-solvers while receiving support from both educators and peers (Fisher et al. 2013; Saracho and Spodek 2009). To foster guided play, educators may provide children with opportunities to interact with games and toys that are aligned with mathematics curricula. For instance, a teacher may introduce Unifix cubes into children's play stations to encourage spontaneous counting behaviors.

Teachers can also facilitate math learning by scaffolding children's spontaneous play experiences. By playing alongside children and making suggestions about creative ways to play or creating games based on mathematical concepts, teachers can build off of children's natural curiosity and create opportunities for mathematics learning. In the area of geometric knowledge, Fisher et al. (2013) found that when children were taught about the properties of shapes using guided play methods, as opposed to free play or didactic pedagogies, they increased their shape knowledge. The authors suggest that the scaffolding techniques present within guided play helped the children learn by increasing engagement and aiding in sense-making (Fisher et al. 2013).

In the current literature, game play is the chief method in which playful learning approaches are integrated into mathematics curricula. Research has shown that when games are combined with educational content, their playful, active, and engaging elements may be used to increase children's motivation (Garris et al. 2002; Habgood and Ainsworth 2011). Instructional games enhance learning, because they increase children's motivation, which in turn increases attention to content and information retention (Garris et al. 2002).

Studies have demonstrated success with integrating mathematics and playful elements such as games with young children (e.g., Griffin 2004; Klein and Starkey 2004; Ramani and Siegler 2008). Games maybe considered guided play when they are accompanied by minimal guidance, whether from an adult or a computer program. Ramani and Siegler (2008) specifically examined the effects of a game and demonstrated that playing a linear number board game—Great Race Game—for four 15- to 20-min sessions within a 2-week period and for a fifth session 9 weeks later increased low-income preschoolers' numerical knowledge in numerical magnitude comparison, number line estimation, counting, and numeral identification. Additionally, Sarama and Clements (2009) demonstrated that children involved in Building Blocks, a mathematics curriculum featuring games and other playful elements, outperformed their peers taking part in their regular mathematics curriculum on measures of counting, geometry, and number combinations.

## 64.6 Science and Guided Play

Science readiness is less of a focus during the early childhood years as other academic content areas, such as literacy and mathematics (Greenfield et al. 2009). However, one key area of interest is the development of young children's "scientific" curiosity, defined as "the threshold of desired uncertainty in the environment which leads to exploratory behavior" (Jirout and Klahr 2012, p. 150). Jirout and Klahr (2012) proposed that children's scientific curiosity may be assessed using a measure of their comfort with different levels of uncertainty using a computer game called Underwater Exploration! During the game, children explore different situations varying in the amount of information available regarding the number of fish that are outside a submarine window. Curiosity is measured by the level of uncertainty the children select regarding their ability to know how many fish are outside the window during the game (Jirout and Klahr 2012).

Children are motivated to discover how things work and to use exploratory play, such as touching and moving objects, to satisfy their scientific curiosity regarding how the world works (Schultz and Bonawitz 2007). Given that children's free, exploratory play is often centered around discovery, it sets up the potential for teachers to incorporate guided play pedagogies into science education. Future research should examine the potential role for guided play in cultivating children's scientific curiosity in conjunction with their natural inclination to engage in exploratory play.

## 64.7 Socio-emotional Development and Guided Play

Studies that seek to improve young children's socio-emotional and self-regulation abilities are largely influenced by the teachings of Vygotsky. According to Vygotsky (1967), pretend play provides a zone of proximal development within which children develop two essential capacities: (1) navigating a possible world where they have to engage in reasoning about play partners' and play characters' motivations, thoughts, and beliefs and (2) the ability to exercise self-regulation in accordance with the implicit rules of the play situation (e.g., Berk et al. 2006; Berk and Winsler 1995; Meyers and Berk 2014). Supporting this claim is research demonstrating that children's engagement in pretend play is related to their theory of mind abilities (Astington and Jenkins 1995; Jenkins and Astington 2000).

What might be the role of teachers in promoting children's socio-cognitive understanding in pretend play? Ashiabi (2007) suggests that children would gain competence and extend their socio-cognitive abilities when teachers participate in play, guide the play as a stage manager, and facilitate who sets the play context, and support the development of play interactions. Teachers can act as mediators when conflicts between children arise that they cannot resolve on their own. Some preliminary evidence that speaks to these claims comes from a study that has shown a

positive relation between rate of parent-initiated guided play and children's prosocial behavior (Ladd and Hart 1992).

Play is also a context in which children develop self-regulation abilities. Self-regulation encompasses actions such as being able to wait for one's turn, resolve conflicts through negotiation rather than resorting to aggressive behavior, and being able to persist at a challenging task despite its difficulty (Berk et al. 2006). Children's competency in executive functioning which involves self-regulatory processes (such as behavior inhibition or acting contrary to one's impulses) is a primary factor that predicts school success above other strong factors such as IQ (e.g., Diamond et al. 2007).

Elias and Berk (2002) investigated whether there is a relationship between engagement in sociodramatic play and children's self-regulation abilities. Specifically, children who already have problems in regulating their behavior (i.e., impulsive children) benefit from play differently. The results showed that the frequency with which children engaged in complex sociodramatic play and their persistence in maintaining the sociodramatic play were significantly related to their self-regulation in cleanup contexts 4–5 months later. Notably, these findings also held for children who were rated as having impulse control problems by their parents.

Another piece of evidence comes from Bodrova and Leong's (2007) Tools of the Mind (Tools) program. This program aims to increase children's self-regulation along with other school readiness abilities (e.g., literacy) through playful learning practices. Tools encourages pretend play in accordance with Vygotskian insights. In this program, sociodramatic playtime is fostered and guided by the teacher who helps children make their daily programs. Teachers facilitate the richness of children's themes by taking them on field trips aimed to improve their world knowledge of roles and role-appropriate behavior. Several studies have documented consistent effects of Tools on children's self-regulation (Barnett et al. 2008; Diamond et al. 2007; but also see Farran et al. 2011). Other large-scale longitudinal studies are currently underway to investigate the effectiveness of this program on multiple school readiness abilities and on different populations.

One of the most pronounced criticisms of the Tools program is that isolating the effects of pretend play is nearly impossible due to the fact that the program incorporates a host of playful learning activities in addition to guided play (Lillard et al. 2013). In fact, Tools, with Montessori and Reggio, is grouped as the curricula that incorporate playful learning practices in all areas of instruction. In this paper, we argue for a formative, integrated playful learning pedagogy that targets a multitude of curricular and developmental objectives. Tools, in this respect, like Montessori and Reggio, provides a very good starting point.

## 64.8 Back to the Problem at Hand: Where Pedagogy Meets Curriculum

The research we have reviewed makes a strong case for joining curricula with a playful learning pedagogy through the use of guided play contexts (for more extensive reviews and comparison with free play, see Fisher et al. 2011). While some specialized curricula such as the Montessori education classrooms have successfully implemented a playful learning approach (Lillard 2005, 2013; Lillard and Else-Quest 2006), a playful pedagogy seems to be increasingly absent from state-funded preschool and pre-K programs. Confirming the suspicion that the preschool classroom is becoming a place of didactic instruction, the Chien et al. (2010) study shows that children's interaction with their teachers were more often didactic (31% of the observed interactions). Interestingly, of the time activity settings investigated, children also seemed to spend most time in free-choice or free-play time (30%). This study provides a clear picture that shows two polar ends of a spectrum: free play vs. didactic instruction. In this chapter, we introduced a middle ground and argued that this dichotomy does not need to exist. In other words, there is a developmentally sensitive and appropriate way to reach curricular objectives without taking the wonder, curiosity, autonomy, and enjoyment out of learning.

In our view, identifying a good candidate to complement didactic instructional practices is one step in solving a multistep problem. We see two important steps that await researchers and educators: the development of integrated comprehensive curricula that incorporate playful pedagogy for all learning objectives and training teachers in effective playful scaffolding techniques. First, it is possible to create a content-strong curriculum that is delivered through guided play. The research shows that we have an idea as to how to target specific learning objectives such as numeracy, vocabulary, narrative competence, and knowledge of science concepts. Indeed, our knowledge at this stage is fragmented and is not easy for policy makers to adopt. What we need is a comprehensive playful learning program that complements didactic learning to target the full list of curricular objectives that are being used to judge the effectiveness of preschool education.

Second, we have to share this information with teachers and supplement professional development so that teachers can effectively use guided play techniques in the classroom. While playful learning is, by definition, enjoyable and fun for children, it is serious work for the teacher. Teachers, who have taken on the brunt of our quest for accountability and have modified their interaction and teaching styles to meet the current demands, may find it difficult to see how playful approaches can yield the expected results. For many, a playful learning approach may mean a more interactive and scaffolded type of free play. Yet, as described, playful learning incorporates identifying clear learning objectives, preparing a setting that will allow for playful exploration of the learning material, observing children to identify the amount and type of support they need, and interjecting subtle yet powerful doses of guidance in fun learning environments.

Whether young children are being educated in the USA, Japan, or any modern society, they will need to know how to seek, discover, and integrate information and to create novel solutions to never-before-seen problems. Adults in this future will need to learn on their feet and know what questions to ask. The research suggests that the way to foster children who can learn independently is teaching curricular objectives through pedagogy that embraces active, engaged, meaningful, and interactive learning. That kind of pedagogy will be evidence-based and will include the ingredients that optimize how children best learn. Playful learning and guided play include these ingredients. A playful pedagogy assists children in their initial learning and in retaining that information over time (e.g., Fisher et al. 2012) and fosters deep thinking while making learning enjoyable. The current trend to reduce children to passive listeners flies in the face of what the data show: children learn best when they are part of the process and not relegated to the sidelines to be docile receptacles of information passed on by adults.

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