



Child Development and Early Learning: A Foundation for Professional Knowledge and Competencies

Children are already learning at birth, and they develop and learn at a rapid pace in their early years. This provides a critical foundation for lifelong progress, and the adults who provide for the care and education of children from birth through age 8 bear a great responsibility for their health, development, and learning. Transforming the Workforce for Children Birth Through Age 8, a 2015 report from the Institute of Medicine and National Research Council, explores the implications of the science of child development for the professionals who work with these children.

Young children thrive when they have secure, positive relationships with adults who are knowledgeable about how to support their development and learning. The science of child development and early learning makes clear the importance and complexity of working with young children from infancy through the early elementary years.

Research during the past decade has revealed much about how children learn and develop. Studies have shown that early childhood is a time when developmental changes are happening that can have profound and lasting consequences for a child's future. While people have long debated whether "nature" or "nurture" plays the stronger role in child development, recent studies reveal the importance of how the two influence each other as a child develops: what a child experiences and is exposed to interacts with his or her underlying biological makeup.

Research has also shown that much more is going on cognitively, socially, and emotionally in young children – including infants – than scientists or care and education professionals previously knew. Even in their earliest years, children are starting to learn about their world in sophisticated ways that are not always reflected in their outward behavior. Learning and development for young children is both rapid and cumulative, continuously laying a foundation for later learning.

These and related insights emerging from research have strong implications for settings where young children are cared for and educated. This booklet provides an overview of this research and its implications for what educators and other adults who work with children need to know and be able to do in order to best support children's healthy development.

The Biology of Early Child Development

Research in developmental biology and neuroscience offers four broad insights about the role of the developing brain and other biological systems in early childhood development:

The developmental window (rapidity of brain development during early childhood). The brain develops through a dynamic interaction between underlying biological processes and exposures and experiences in the environment. This process begins at conception and continues throughout life. During a child's early years, the brain develops in rapid and fundamental ways, and connections among neurons are reinforced. Because of this, early childhood is a window of both great risk of vulnerability to disruption and great potential for the impact of positive developmental influences.

The interplay of genes and environment. In many or even most cases, the causes of healthy, normal development – as well as disease, disorders, and developmental problems – are best viewed as an interplay between genes and environment. While a child's genetic makeup has an influence on how strongly he or she is affected by some environmental factors or experiences, emerging research also shows that influences in the environment can shape whether genes are turned off or on. Neither environment nor biology alone is destiny.

The impact of stress on development. There is now strong evidence that early psychological and social adversities – beginning even during fetal development – can have important short- and long-term effects on the brain's development and the way the brain and body handle stress. In addition to the brain, multiple systems are involved in the response to stress and can be affected by chronic adversity, including the immune system and the endocrine system. While enriching experiences in the early years will support healthy brain development, disturbances or deficiencies before birth or in early childhood can interrupt or alter the growing brain, resulting in changes that range from subtle incapacities to generalized developmental disabilities.

Examples of serious stressors faced by many children include abuse or neglect, the death of a parent, food insufficiency, housing instability, a parent living with mental illness, or exposure to conflict or violence in the home or neighborhood. Although children at any socioeconomic level can experience stressors, children in marginalized populations or who experience chronic economic adversity face a disproportionate risk of experiencing a confluence of multiple sources of chronic stress.

Individual differences in sensitivity to environments. There are substantial individual differences in how susceptible children are to influences in their environment. Some individuals seem more sensitive to both positive and negative influences; others survive challenging environments and seem to thrive with little detrimental effect.

Together, these four broad insights have reshaped understanding of the formative experiences of children in their families, communities, health care settings, childcare and preschool centers, and schools. These insights also have implications for those who educate and care for young children – and they make clear the complexity and importance of this role.

Together with the research in developmental biology and neuroscience, research in developmental, cognitive, and educational psychology has contributed to a greater understanding of the developing child. The picture that has emerged is remarkably complex and reveals that many aspects of development and learning are interrelated. For example, a child relies on developing an ability to regulate emotions and attention in order to concentrate and stay engaged long enough to learn new ideas and skills.

Similarly, while certain skills and concepts are distinct to particular subject areas, learning in these subject areas also relates to general cognitive skills such as reasoning, attention, and memory. Learning is also influenced by a child's developing relationships with adults and peers. A child's security both physically and in relationships creates the context in which learning is achievable. Physical health matters as well; studies have linked food insecurity among children and their families to poor academic outcomes, for example, while increased physical activity has been linked to improved academic performance.

Keeping in mind that there are multiple interrelated and mutually reinforcing aspects of child development, the sections that follow describe developmental processes in three areas:

1. General cognitive development,
2. Subject-area learning, and
3. Social and emotional development.

Please see Chapter 3, *The Interaction of Biology and Environment*, in *Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation* to learn more about the biology of early child development.

Supporting Children's Cognitive Development

Studies of cognitive development have led researchers to understand the developing mind as astonishingly active and insightful from a very young age. As early as infancy, for example, children derive theories to explain the behavior of people and the actions of objects. Being aware of what research has discovered about babies' and young children's cognitive development can help adults who work with children better support their learning.

Infants and toddlers

Research has shown that what is going on in babies' and young children's minds is much more complex and sophisticated than their outward behavior reveals. Early learning occurs on two levels: the growth of knowledge that is visible and apparent – language learning, for example, and learning about how objects work – and the growth of implicit learning, which is harder to observe.

Many of the strikingly competent and insightful things going on in young children's minds are not transparent in their behavior. Because of this, the cognitive abilities of young children are easily underestimated.

Some of the recent research has shown that even very early, children:

Have a “theory of mind.” Babies have a capacity to reason about and understand the mental lives and intentions of others. For example, when 1-year-olds are faced with something or someone unfamiliar, they look at their mothers to read her expression to determine whether the unfamiliar person or object is benign or dangerous. Babies as young as 14 months old who see an adult struggling to reach for an object will interrupt their play to crawl over and hand the object to the adult.

Have theories of numbers. Even babies seem capable of intuitively understanding something that approximates addition and subtraction, and they are surprised when something counter to these principles occurs. For example, when babies see an object that is then screened from view and then they see that another object is placed behind the screen, they are surprised when the screen is lowered if there is only one object there.

Can make inferences about cause and effect. Young children can experience observations and learning that allow them to conclude that a particular factor X causes (or prevents) an effect Y. In one study, for example, preschool children were shown a machine and told that “blickets” make the machine go. Block A placed on the machine always made it go. Block B was associated with the machine turning on but only when Block A was also on the machine. Children correctly identified Block A as the “blicket” and not Block B. They were also able to intervene correctly to make the machine stop by removing Block A and not Block B.

Are sensitive to the statistical probability of events. In one set of studies, for example, 11-month-old babies were shown an opaque box full of many red balls and only a few white balls. The babies showed surprise when balls were poured out of the box and all of them happened to be white, or when someone reached into the box and happened to retrieve all white balls. The babies were registering the low proportion of white balls and recognizing the improbability of these events. However, if the experimenter looked into the box as she picked up the balls, the babies were not surprised if all white balls were selected. This suggests that babies' implicit knowledge of theory of mind – in this case, understanding that a person can deliberately select objects – will trump their reasoning about statistical likelihood.

Are sensitive to teaching cues. As early as infancy, children devote special attention to social situations that are likely to represent learning opportunities because adults communicate their intention to teach something. When adults make eye contact, call a baby's name, and point for the baby's benefit, these signals lead babies to recognize that someone is teaching them, and this awareness can affect how and what they learn.

These research findings need to be part of the core knowledge that influences how care and education professionals support young children's learning. In the past, the prevalent belief that children are "concrete" thinkers – they cannot deal with abstraction or reason hypothetically – led educators to focus on simple, descriptive activities and miss opportunities to explore cause and effect, theories of numbers, and statistical probability.

Educators can support the growth of these cognitive abilities – for example, by using an abundance of child-directed language during social interaction, by playing sorting and counting games (for example, while stacking blocks), by putting words to why somebody looks sad, and by exploring together what happens when objects collide. These and other shared activities build on understandings that young children are implicitly developing.

Relationships and Early Learning

The relationship of an adult to a child – the emotional quality of their interaction, the experiences they share, the adult's beliefs about the child's capabilities – helps motivate young children's learning and inspire their self confidence. Commonplace interactions provide contexts for supporting the development of cognitive and learning skills and the emotional security in which early learning thrives. Applauding a toddler's physical skills or a second grader's writing skills, counting together the leaves on the sidewalk or the ingredients of a recipe, interactively reading a book, talking about a sibling's temper tantrum or an episode of classroom conflict between children – these and other shared experiences contribute to young children's cognitive development and early learning.

Preschool and early elementary years

During these years, children's learning is more explicit and visible. Preschoolers are more competent in deliberate approaches to learning, such as trial and error or informal experimentation. Preschoolers are experiential, learning by doing rather than figuring things out only by thinking about them. This makes shared activities with educators and peers potent opportunities for cognitive growth.

Still, the potential to underestimate the cognitive abilities of young children persists in the preschool and kindergarten years. In one study, for example, children's actual performance was six to eight times what was estimated by their own preschool teachers as well as experts in educational development. A study in kindergarten revealed that teachers spent most of their time on content the children already knew.

When educators practice in a way that is aware of the cognitive progress of children at this age they can deliberately enlist the child's existing knowledge and skills in new learning opportunities. Greater achievement in this age group is associated with instructional strategies that promote higher-level thinking, creativity, and some abstract understanding, such as talking about ideas or future events. For example, when educators point out how numbers can be used to describe diverse sets of elements (four blocks, four children, 4 o'clock), it helps children generalize an abstract concept ("fourness"). Another example is interactive storybook reading, in which children describe the pictures and label their elements while the adult and child ask and answer questions of each other about the narrative. Preschoolers' interest in learning by doing is also naturally suited to experimental inquiry related to science and other types of learning that involve developing and testing hypotheses.

In the early elementary years, children are using more complex vocabulary and grammar. They are growing in their ability to make mental representations, although they still have difficulty grasping abstract concepts without the aid of real-life references and materials. At these ages, children are also increasingly able to understand and manage their emotions. They make sense of their own feelings more and more, and learn better ways to describe experiences and express thoughts and feelings. This increasing ability to manage their thoughts and feelings also means that they have a greater ability to follow instructions independently in a manner that would not be true of preschool or younger children. Educators can rely on children's growing cognitive abilities to use instructional approaches that depend on children's own independent discoveries, their use of alternative strategies for inquiry, and their greater persistence in problem solving.

Please see Chapter 4, *Child Development and Early Learning*, in *Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation* to learn more about supporting children's cognitive development.

Supporting Subject-Area Learning

Some principles for instructional practices are generally applicable across subject areas and across different domains of development and learning, such as:

Teaching through learning trajectories. Children learn in a developmental sequence as they progress through increasingly sophisticated levels of thinking and understanding of concepts as well as mastering skills. Well-designed curricula are therefore based on developmentally sequenced activities. Quality instructional practice requires that educators understand and employ three components of learning trajectories: (1) the subject-matter content itself, (2) the developmental progression of how children's thinking and understanding grows as they learn particular content, and (3) the instructional tasks and strategies that promote learning along that progression. Educators also need to be able to assess the progress of groups and individual children and to adjust the learning environment and instructional activities accordingly.

Using a mix of instructional methods. Debates about instruction often treat different methods as dichotomous or in opposition, but effective instructional approaches actually serve children best when multiple complementary instructional strategies are used in combination – for example, when instructor-led teaching is alternated with activities in which children learn cooperatively with one another.

Using tiered intervention approaches. In these approaches, educators use ongoing assessment methods to identify which children have learned particular content or mastered specific skills and which children might benefit from additional instruction for that set of proficiencies. These additional learning opportunities are offered one on one or in small groups with more intensive instructional support.

Ensuring continuity and alignment. The development and learning of young children depends on continual, cumulative support. Early progress as a result of high-quality early childhood experiences may be weakened by later settings that do not have the same quality or that, for example, focus on lower-level skills, assume children have low levels of knowledge, and/or have low expectations for certain children. Similarly, the effects of high-quality instruction in elementary school can be hampered by children's lack of prior exposure to foundational, high-quality learning experiences. For this reason, goals and approaches need to be aligned across early childhood and elementary settings. Continuity is facilitated when rigorous, evidence-informed standards, curricula, assessments, and teaching practices are coherently aligned with each other and across ages and grade levels.

In addition to these general principles, every subject area also requires that children acquire specific content knowledge and skills – and correspondingly, that educators have specific knowledge and competencies in instructional and assessment practices. Two core subject areas – language and literacy and mathematics – are discussed further here because they are foundational for other subject areas and for later academic achievement. How they are learned has been extensively studied in young children, compared to other subject areas.

Language and literacy

The oral language and vocabulary children learn through interactions with parents, siblings, caregivers, and educators provide the foundation for later literacy and learning across all subject areas. Children benefit from extensive opportunities to listen to and use complex spoken language. The more often adults use particular words in conversation with young children, the sooner children will use those words in their own speech.

Research in early childhood classrooms serving children from low-income backgrounds suggests that daily high-quality language building experiences may be rare. Even small improvements in the literacy environment can have especially strong effects for these children.

Infants and toddlers

Educators serving infants and toddlers can use several key strategies to foster effective environments for language learning.

Use language-based interactions to develop trusting bonds. Consistently responding to infants' and toddlers' communication with talk and encouragement that is emotionally attuned is crucial for early language development. At this stage of development, it is particularly important that these language interactions be responsive to children's emotional expressions, such as laughter or crying, and expressions of need.

Use talk for learning. Language development is supported by ongoing exposure to elaborate language, as well as simple requests and questions that draw out children's first words and phrases. Educators can create high-quality language environments by intentionally and thoughtfully using their own talk – through explanations, questioning, and descriptions – to build up the knowledge of those in their care. Instructional use of talk can include “narrating” events of the day (for example, “We’re crossing the road to get to the park.”) and describing children's actions as they are performing them (“You’re putting your hand in the warm mitten.”). Using talk for learning also involves extending children's language by supplying additional words and more complex sentence structures (for example, when a child says “Up!” then saying “You want me to pick you up?”).

Using talk for learning is most effective when early educators engage in discussions of the here and now that also take young children beyond their immediate surroundings and experiences. An educator might begin with the here and now (for example, a child's expression of interest in an object); expand from there (talking about the object's appearance or what one can do with it); and then engage in talk that goes beyond the immediate context (making a plan for using the object later in the day or discussing a prior use of the object). In this example, the educator is responding to children's interests and real-time experiences, situating language learning in meaningful contexts.

It is also important for educators to engage groups of children in extended discourse. This should include asking and discussing open-ended questions, which require more than a “yes” or “no” and prompt reflection. Educators should encourage children to take turns responding, as well as monitor the group to involve nonparticipating children.

Engage in language-rich play. Play is a means of learning in early childhood, and educators should be able to weave language learning throughout the play of young children. Educators can and should use songs and gestures, flannel board stories, puppets, and other materials that prompt the use of talk by children and adults alike. Language-rich play includes not only adult-child interactions, but also – beginning as early as toddlerhood – groups of children. When facilitating play among groups of toddlers, educators should intentionally support and guide the language experience – for example, by narrating events and using strategies to encourage peer interactions.

Read a variety of books and reread favorites. Children become “readers” long before they begin to read. Educators should make reading aloud with children part of the daily routine. Regular exposure to this type of shared book reading will build children's language as well as their interest in print. This is another chance to be emotionally attuned and strengthen bonds with young children. Interactive storybook reading with children – in other words, having conversations as stories are read – is one of the best-documented methods for improving the vocabularies of children.

Preschool and early elementary school

Language and literacy development is a major focus of instruction in prekindergarten and K-3 classrooms. Primary grade educators tend to be strong in certain aspects of effective language and literacy instruction, such as word-reading skills. However, other areas – especially vocabulary, reading comprehension, and conceptual and content knowledge – are not as emphasized, especially in the use of informational texts that would enhance early reading skills.

Research has shown that in high-quality classroom language environments educators use a variety of abstract words and complex sentences. Whether teachers are providing directions, reviewing information, or posing questions, sophisticated talk permeates classroom instruction and conversation. In such environments, children also participate in content-based discussions and purposeful play and above all, have the chance to talk (and talk and talk).

The following are three strategies educators can use to strengthen the quality of classroom language environments.

Organize classroom learning around content-based and multifaceted units of study. Learning through extensive study of a topic is a hallmark of effective language and literacy instruction in these years. For example, thematic units organized around multifaceted topics elicit the use of complex vocabulary by teachers and are one way to foster complex language knowledge among children. Each unit should revolve not only around content-rich themes, but also around a complementary, small set of target vocabulary words that lend themselves to talking and writing throughout the unit. These words should be academic in nature – more commonly used in academic content areas than in day-to-day conversation – and conceptually abstract, therefore requiring study and extended discussion to promote an understanding of the concepts and ideas they represent.

Vary instructional groupings so that children have regular, frequent opportunities for extended conversations with their peers and teachers. Different instructional groupings – whole group, small group, and pairs – lend themselves to different kinds of language experiences, all of which combine to make a high-quality classroom language environment. In particular, pairs and small groups provide children with the opportunity to participate in strong language experiences. When instruction involves pairs or small groups, it is important to (1) plan groupings that strategically support language development – for example, grouping children of different language skills together so that children with stronger language skills model use of language for peers with more limited language skills; and (2) guide and support peer interactions – for example, assigning and posting visuals that display steps. In all cases, it is important to offer children topics to discuss and/or protocols for conversation.

It is also important for children to have regular, frequent opportunities to participate in educator-facilitated small-group discussions – back-and-forth conversations in which the educator builds on and extends students' language and ideas. The whole day is filled with moments ripe for planned and spontaneous teaching and learning moments. Back-and-forth conversations can be incorporated into many aspects of the daily schedule – even during routines such as hand washing, lining up, and gathering belongings. For example, educators might provide daily questions for children to think about as they engage in a transition – for example, lining up to go down the hall – and then have children share their responses with a partner when they reach their destination.

Use read-alouds as a platform for conversation. Interactive readings of a variety of books related to the content under study increases the quality of the language environment in at least two ways. First, the written language often stands in contrast to conversational, and even instructional, language. Second, classroom read-alouds are foundational for spurring content-rich classroom discussions. The content of high-quality children's books – both fiction and informational texts – lends itself to discussion of topics in the sciences, social studies, and the arts, all of which spur the use of academic and sophisticated words.

Mathematics

If given opportunities to learn, young children possess a remarkably broad, complex, and sophisticated – albeit informal – knowledge of mathematics. In their free play, almost all preschoolers engage in substantial amounts of pre-mathematical activity. They count objects; compare magnitudes; and explore patterns, shapes, and spatial relations.

Children’s early knowledge of mathematics is surprisingly important and it strongly predicts later success in mathematics. Mathematical thinking reaches beyond competence with numbers and shapes to form a foundation for general cognition and learning. Difficulties with math are a strong predictor of failure to graduate high school. Given its importance, children need a robust foundation in mathematics knowledge in their earliest years.

However, mathematics is generally not taught well to young children. Preschool educators tend not to support mathematics learning and when they do it is often of a low quality. Most early childhood educators in the United States receive weak preparation for teaching mathematics, which may in part be due to their having a low level of mathematics knowledge prior to their choosing to pursue teaching as a profession. Because content knowledge is a prerequisite for knowing how to teach the content, increasing the mathematics knowledge of early childhood educators needs to be a priority.

Mathematical learning trajectories

Children generally follow certain developmental paths in learning mathematics. As they learn about a mathematical topic, they progress through increasingly sophisticated levels of thinking. These form the core of a “learning trajectory.” For example, children learn to count first by chanting and reciting number words, then being able to make a one-to-one correspondence between those counting words and objects, and then being able to accurately count a set of objects. These activities help children understand the concept of “how many” and ultimately grasp the mathematical principle of cardinality – that the number of elements in a grouping is a property of that grouping.

Effective educators understand both the mathematics and the progression of levels of thinking along these paths and are able to sequence and individualize activities accordingly. To use learning trajectories in mathematics, educators need to understand:

- The content they teach. For example, they must understand how counting involves much more than simple verbal recitation of number words.
- The levels of thinking in the learning trajectory and how to assess where their class – and individual children – are functioning along that trajectory.
- What instructional activities are appropriate to support children’s development of each level of thinking, why they are appropriate, and how to adapt instructional tasks and activities for children at different levels of thinking.

Educators also need to know strategies for developing children’s positive attitudes and productive dispositions toward mathematics – for example, using problems that have meaning for children (both practical and mathematical) and providing opportunities for both creative invention and practice.

Please see Chapter 6, Educational Practices, in *Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation* to learn more about supporting subject-area learning and educational practices.

Supporting Children's Social and Emotional Development

The development of social and emotional competence is an important part of children's early development and learning. Social and emotional competence means the ability to understand and manage emotions and behavior, to make decisions and achieve goals, and to establish and maintain positive relationships, including feeling and showing empathy for others.

Developing these capacities is important for children's learning and academic success. Social and emotional competence give children the capacity to engage in academic tasks by increasing their ability to interact constructively with teachers, work effectively with peers, and dedicate sustained attention to learning.

Aspects of social and emotional development

Relationships and emotional well-being. The emotional support and security provided by positive relationships contributes in many different ways to young children's learning success. For example, children who have secure relationships with their parents develop greater social skills with adults and peers and greater social and emotional understanding of others, show more advanced moral development, and have a more positive self-concept. Securely attached children also have been found to be more advanced in cognitive and language development and to show greater achievement in school.

A smaller but significant body of research has looked at attachments between children and educators. As with their parents and other caregivers, children who receive strong emotional and instructional support from their educators can approach learning opportunities more positively and confidently, and the quality of those relationships has a significant and potentially enduring influence on their classroom success. In one study, preschoolers identified as academically at risk based on demographic characteristics and reports of problems by their kindergarten teachers were followed to the end of first grade. The children with first-grade teachers who provided high amounts of instructional and emotional support had achievement scores comparable to their low-risk peers.

Emotional regulation and self-management. A child's ability to regulate his or her emotions, thoughts, and behaviors in different situations – managing stress, controlling impulses, and working toward goals – can affect learning and relationships with adults and peers. Children who lack effective self-regulation do not participate in a productive way in learning activities. They may act disruptively and aggressively; they then receive less support from their peers, which in turn may undermine their learning.

Young children are better able to exercise self-regulation in the company of educators who have developmentally appropriate expectations for their self-control, provide predictable routines, and offer guidance that scaffolds their developing skills of self-management – especially in the context of carefully designed daily practices in a well-organized setting.

Social and emotional understanding. Starting with a straightforward awareness that people act intentionally and are goal directed, have positive and negative feelings in response to things around them, and different feelings and goals, young children develop an increasingly sophisticated understanding of the mental experiences that cause people to act as they do. They realize, for example, that people's beliefs about reality can be accurate or may be mistaken, and this leads to the understanding that people can be deceived and that not everybody can be believed. They also begin to appreciate how personality differences among people can cause different individuals to act in the same situation in very different ways.

Children learn how people think and feel from directly observing, asking questions, and conversing about people's mental states with parents and other trusted informants. These advances are also fostered by children's classroom experiences. Educators can use children's experiences as forums for developing social and emotional understanding – for example, when they explain why peers are feeling the way they do, suggest strategies for resolving conflict over resources or a point of view, or engage children in collective decision making that involves different opinions.

Self-awareness and early learning. How young children think of themselves as learners influences their academic success. Young children become increasingly sensitive to positive and negative evaluations of their behavior, which serve as the basis for their self-evaluations. Research has revealed how parents' and educators' performance feedback affect children's self-concept and motivation to succeed.

In one study, 4-year-old children were represented by puppets whose performance was praised by a teacher using either feedback that implied trait-based, ability-centered success – “You are a good drawer.” – or feedback that implied situation-based, effort-centered success – “You did a good job drawing.” When their puppet subsequently made a mistake and was criticized for it, the 4-year-olds who had heard the ability-centered feedback evaluated their performance and the situation more negatively than children who had heard the effort-centered feedback, suggesting that they interpreted criticism as reflecting deficits in their ability. Similar results were reported in two other studies that found that situation-based, effort-centered performance feedback strengthened children's task persistence and self-evaluation.

Chronic stress and adversity. Chronic stress can affect children's development. A substantial body of evidence now shows that adversity and stress in early life are associated with higher rates of childhood mental and physical problems, more frequent disturbances in development and educational achievement, and lifelong risks of chronic disorders that compromise health and well-being. Circumstances that contribute to this chronic stress include poverty and abuse, as well as less severe but persistent circumstances such as parents' chronic marital conflict.

Social support, however, can buffer the effects of stress. Individuals in adversity show less behavioral reactivity and better-regulated cortisol (a stress hormone) when in the company of people who provide them with emotional support. For children, these individuals can be figures in the family or outside the home.

Fostering social and emotional development

Generally speaking, learning environments that are well-structured and predictable, provide support for children's self-regulatory capacities, and offer secure and warm relationships with educators will benefit children's social and emotional development, as can some curricula and interventions designed to promote social and emotional learning.

These supports in the learning environment can also be a buffer for the negative effects children experience as a result of chronic stress and adversity. However, such children, as well as other children facing challenges with their social and emotional development, may have other specific needs for support. Child mental health consultants and referrals to specialized services can be resources for educators in supporting children's social and emotional development. Consultants can provide educators with guidance on classroom management and instructional practices for all children, as well as individualized consultation for particular children based on classroom observations.

Please see Chapter 4, *Child Development and Early Learning*, in *Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation* to learn more about supporting children's social and emotional development.

Building Competencies in Care and Education Professionals

Children's health, development, and early learning provide a foundation on which later learning – and life-long progress – is constructed. The adults who provide for their care and education bear a great responsibility. Care and education professionals are best able to support children from birth through age 8 when they have a shared foundation of knowledge and competencies related to development and early learning across this age span. This foundation needs to be augmented by specialized knowledge and competencies depending on the specific age groups with which they work or for specific professional roles such as early intervention specialists, mental health consultants, or language development specialists.

Foundational knowledge and competencies for all adults with professional responsibilities for young children

All adults with professional responsibilities for young children need to know about

- How a child develops and learns, including cognitive development, specific content knowledge and skills, general learning competencies, socioemotional development, and physical development and health.
- The importance of consistent, stable, nurturing, and protective relationships that support development and learning across domains and enable children to fully engage in learning opportunities.
- Biological and environmental factors that can contribute positively to or interfere with development, behavior, and learning (for example, positive and ameliorative effects of nurturing and responsive relationships, negative effects of chronic stress and exposure to trauma and adverse events, positive adaptations to environmental exposures).

All adults with professional responsibilities for young children need to use this knowledge and develop the skills to

- Engage effectively in quality interactions with children that foster healthy child development and learning in routine everyday interactions, specific learning activities, and educational and other professional settings in a manner appropriate to the child's developmental level.
- Promote positive social development and behaviors and mitigate challenging behaviors.
- Recognize signs that children may need to be assessed and referred for specialized services (for example, for developmental delays, mental health concerns, social support needs, or abuse and neglect); and be aware of how to access the information, resources, and support for such specialized help when needed.
- Make informed decisions about whether and how to use different kinds of technologies as tools to promote children's learning.

Knowledge and competencies for educators of children birth through age 8

The following are important shared competencies that all professionals who provide direct, regular care and education for young children need to support development and foster early learning with consistency for children on the birth through age 8 continuum.

Core Knowledge Base

Knowledge of:

- developmental science that underlies important domains of early learning and child development, including cognitive development, specific content knowledge and skills, general learning competencies, socioemotional development, and physical development and health
- how these domains interact to facilitate learning and development
- content and concepts important in early learning of major subject-matter areas, including language and literacy, mathematics, science, technology, engineering, arts, and social studies
- learning trajectories (goals, developmental progressions, and instructional tasks and strategies) of how children learn and become proficient in each of the domains and specific subject-matter areas
- science that elucidates the interactions among biological and environmental factors that influence children's development and learning, including the positive effects of consistent, nurturing interactions that facilitate development and learning as well as the negative effects of chronic stress and exposure to trauma and adversity that can impede development and learning
- principles for assessing children that are developmentally appropriate; culturally sensitive; and relevant, reliable, and valid across a variety of populations, domains, and assessment purposes

Practices to Help Children Learn

Ability to:

- establish relationships and interactions with children that are nurturing and use positive language
- create and manage effective learning environments (physical space, materials, activities, classroom management)
- consistently deploy productive routines, maintain a schedule, and make transitions brief and productive, all to increase predictability and learning opportunities and to maintain a sense of emotional calm in the learning environment
- use a repertory of instructional and caregiving practices and strategies, including implementing validated curricula, that engage children through nurturing, responsive interactions and facilitate learning and development in all domains in ways that are appropriate for their stage of development
- set appropriate individualized goals and objectives to advance young children's development and learning
- use learning trajectories: a deep understanding of the subject; knowledge of the way children think and learn about the subject; and the ability to design and employ instructional tasks, curricula, and activities that effectively promote learning and development within and across domains and subject-matter areas
- select, employ, and interpret a portfolio of both informal and formal assessment tools and strategies; to use the results to understand individual children's developmental progression and determine whether needs are being met; and to use this information to individualize, adapt, and improve instructional practices
- integrate and leverage different kinds of tech-

nologies in curricula and instructional practice to promote children's learning

- promote positive social development and self-regulation while mitigating challenging behaviors in ways that reflect an understanding of the multiple biological and environmental factors that affect behavior

- recognize the effects of factors from outside the practice setting (for example, poverty, trauma, parental depression, experience of violence in the home or community) that affect children's learning and development and adjust practice to help children experiencing those effects

Working with Diverse Populations of Children

Ability to:

- advance the learning and development of children from backgrounds that are diverse in family structure, socioeconomic status, race, ethnicity, culture, and language
- advance the learning and development of children who are dual language learners
- advance the development and learning of children who have specialized developmental or learning needs, such as children with disabilities or learning delays, children experiencing chronic stress/adversity, and children who are gifted and talented (all early care and education professionals – not just those in specialized roles – need knowledge and basic competencies for working with these children)

Developing and Using Partnerships

Ability to:

- communicate and connect with families in a mutually respectful, reciprocal way, and to set goals with families and prepare them to engage in complementary behaviors and activities that enhance development and early learning
- recognize when behaviors and academic challenges may be a sign of an underlying need for referral for more comprehensive assessment, diagnosis, and support (for example, mental health consultation, social services, family support services)
- gain knowledge of professional roles and available services within care and education and in closely related sectors such as health and social services
- access and effectively use available referral and resource systems
- collaborate and communicate with professionals in other roles, disciplines, and sectors to facilitate mutual understanding and collective contribution to improving outcomes for children

Continuously Improving Quality of Practice

- Ability and motivation to access and engage in available professional learning resources to keep current with the science of development and early learning and with research on instructional and other practices
- Knowledge and abilities for self-care to manage their own physical and mental health, including the effects of their own exposure to adversity and stress

Knowledge and competencies for leadership in settings with children birth through age 8

In addition to the foundational knowledge and competencies for all people with professional responsibilities for young children, center directors, childcare owners, principals, and other leaders and administrators who oversee care and education settings for young children birth through age 8 need both specific competencies and overlapping general competencies with the roles of the specific professionals they supervise.

Practices to Help Children Learn

- Understanding the implications of child development and early learning for interactions of care and education professionals with children, instructional and other practices, and learning environments
- Ability to keep current with how advances in the research on child development and early learning and on instructional and other practices inform changes in professional practices and learning environments

Assessment of Children

- Knowledge of assessment principles and methods to monitor children's progress and ability to adjust practice accordingly
- Ability to select assessment tools for use by the professionals in their setting

Fostering a Professional Workforce

Ability to:

- understand the competencies needed to work with children in the professional setting they lead
- use knowledge of these competencies to make informed decisions about hiring and placement of practitioners
- formulate and implement policies that create an environment that enhances and supports quality practice and children's development and early learning
- formulate and implement supportive and rigorous ongoing professional learning opportunities and quality improvement programs that reflect current knowledge of child development and of effective, high-quality instructional and other practices
- foster the health and well-being of their staff and seek out and provide resources for staff to manage stress

Assessment of Educators

Ability to:

- assess the quality of instruction and interactions; to recognize high quality or to identify and address poor quality through evaluation systems, observations, coaching, and other professional learning opportunities
- use data from assessments of care and education professionals appropriately and effectively to make adjustments to improve outcomes for children and to inform professional learning and other decisions and policies

Developing and Fostering Partnerships

Ability to:

- support collaboration among the different kinds of providers under their leadership
- enable interprofessional opportunities for themselves and their staff to facilitate linkages among health, education, social services, and other disciplines not under their direct leadership
- work with families and support their staff to work with families

Organizational Development and Management

- Knowledge and ability in administrative and fiscal management, compliance with laws and regulations, and the development and maintenance of infrastructure and an appropriate work environment.

Currently, despite their shared objective of nurturing and securing the future of young children, those who work with these children are not acknowledged as a cohesive professional workforce, unified by the common knowledge and competencies needed to do their jobs well. Strengthening the competencies of the workforce is challenging because those who care for and educate young children work in a variety of settings such as homes, childcare centers, preschools, educational programs, and elementary schools. Oversight and influence are complicated because the care and education of young children take place in so many different contexts: with different practitioner traditions and cultures, funded through multiple government and nongovernment sources, and operating under the management or regulatory oversight of diverse agencies.

Care and education professionals across settings and professional roles need access to high-quality professional learning that supports them in acquiring and applying the competencies they need. High-quality professional learning systems encompass a coherent series of activities to prepare professionals for practice, assess and ensure their competency to practice, and continuously enhance the quality of their ongoing practice.

Please see Chapter 7, *Knowledge and Competencies*, in *Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation* for more information about the foundational knowledge and competencies for all adults with professional responsibilities for young children as well as for knowledge and competencies for educators and leaders.

Interacting Elements of Supporting Quality Professional Practice

Stronger support for care and education professionals will require involvement from local, state, and national leadership; building a culture in higher education and ongoing professional learning that reflects the importance of establishing a cohesive and coordinated workforce for children from birth through age 8; ensuring practice environments that enable and reinforce the quality of their work; making substantial improvements in working conditions, well-being, compensation, and perceived status or prestige; and creating consistency across local, state, and national systems, policies, and infrastructure.

As with multiple sets of complex gears, many interconnected elements need to move together to support a convergent approach to caring for and teaching young children – one that allows for continuity across settings from birth through elementary school, driven by the shared core of the science of child development and early learning (see Figure 1 below).

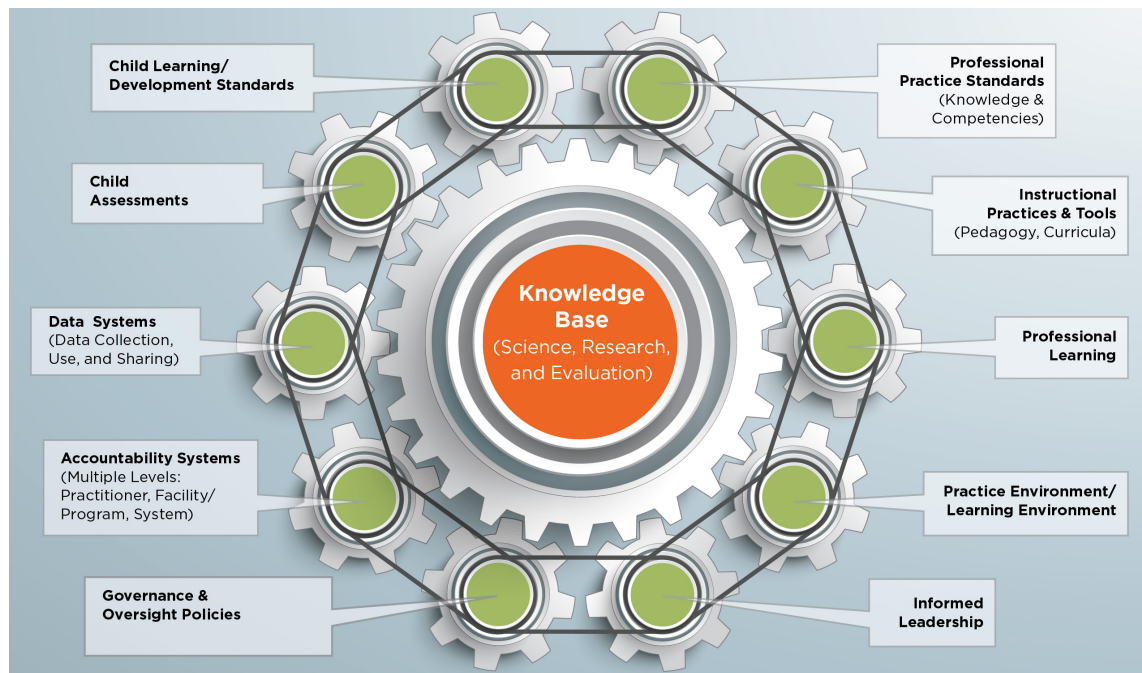


FIGURE 1. Interacting elements of supporting quality professional practice for the care and education of children from birth through age 8.

A blueprint for action

A blueprint for action to strengthen the care and education workforce is based on the unifying foundation of the science of child development and early learning and the principles for supporting high-quality professional practice. At the core of this blueprint are interrelated recommendations to improve professional learning systems in the areas of qualification requirements, higher education, professional learning during ongoing practice, and continuous quality improvement. Success will require coordinated actions by multiple stakeholders, often working in different systems and sectors and at different levels.

Please see Chapter 12, *A Blueprint for Action*, in *Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation* for more information as well as implementation considerations for each recommendation.

Summary Areas of Recommendation

Qualification Requirements for Professional Practice

Recommendation 1: Strengthen competency-based qualification requirements for all care and education professionals working with children from birth through age 8.

Recommendation 2: Develop and implement comprehensive pathways and multiyear timelines for transitioning to a minimum bachelor's degree qualification requirement, with specialized knowledge and competencies, for all lead educators working with children from birth through age 8.

Recommendation 3: Strengthen practice-based qualification requirements for all lead educators working with children from birth through age 8.

Higher Education and Ongoing Professional Learning

Recommendation 4: Build an interdisciplinary foundation in higher education for child development.

Recommendation 5: Develop and enhance programs in higher education for care and education professionals working with children from birth through age 8.

Recommendation 6: Support the consistent quality and coherence of professional learning supports during ongoing practice for professionals working with children from birth through age 8.

Evaluation and Assessment of Professional Practice

Recommendation 7: Develop a new paradigm for evaluation and assessment of professional practice for those who work with children from birth through age 8.

The Critical Role of Leadership

Recommendation 8: Ensure that policies and standards for care and education leaders encompass the foundational knowledge and competencies needed to support high-quality practices for child development and early learning.

Interprofessional Practice

Recommendation 9: Strengthen collaboration and communication among professionals and systems within the care and education sector and with closely related sectors, especially health and social services.

Support for Implementation

Recommendation 10: Support workforce development with coherent funding, oversight, and policies.

Recommendation 11: Collaboratively develop and periodically update coherent guidance that is foundational across roles and settings for care and education professionals working with children from birth through age 8.

Recommendation 12: Support comprehensive state and local level efforts to transform the professional workforce for children from birth through age 8.

Improvement of the Knowledge Base

Recommendation 13: Build a better knowledge base to inform workforce development and professional learning services and systems.

Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation

The full report and additional resources are available at www.nas.edu/birthto8.

Additional Resources

- A separate booklet, *Professional Learning for the Care and Education Workforce*, takes an in-depth look at how systems for professional learning can be improved.
- *A Community Mapping Discussion Guide for Birth Through Age 8 Stakeholders* helps potential partners explore ways to work together to improve professional learning and other supports for the workforce. The companion Interactive Community Mapping tool offers a series of maps to help stakeholders build partnerships in order to help implement the recommendations of this report.
- *Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation – Strengthening Policy and Practice* is a guide on implementing recommendations targeted for policy makers.
- *Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation – Report Brief for Educators and Caregivers* is a brief on the foundation of science-based knowledge and competencies for practitioners and leadership in the early care and education workforce through age 8.

About this booklet: This booklet was prepared by the Board on Children, Youth, and Families based on the report Transforming the Workforce for Children Birth Through Age 8: A Unifying Foundation, which was authored by the Committee on the Science of Children Birth to Age 8: Deepening and Broadening the Foundation for Success.

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