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ASSOCIATION



TOP 20 PRINCIPLES FROM PSYCHOLOGY FOR EARLY CHILDHOOD TEACHING AND LEARNING

Coalition for Psychology in Schools and Education

TOP 20 PRINCIPLES FROM PSYCHOLOGY FOR EARLY CHILDHOOD TEACHING AND LEARNING

COALITION FOR PSYCHOLOGY IN SCHOOLS AND EDUCATION

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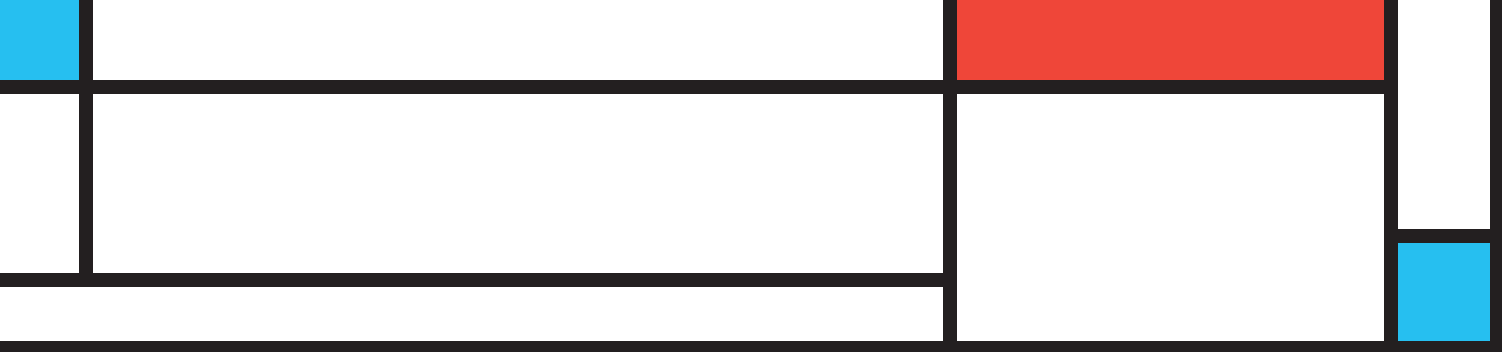
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TOP 20 PRINCIPLES FROM PSYCHOLOGY FOR EARLY CHILDHOOD TEACHING AND LEARNING

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Children's beliefs or perceptions about intelligence and ability affect their cognitive functioning and learning.

PRINCIPLE 2

What children already know affects their learning.

PRINCIPLE 3

Children's cognitive development and learning are not limited by general stages of development.

PRINCIPLE 4

Learning is based on context, so generalizing learning to new contexts is not spontaneous but instead needs to be facilitated.

PRINCIPLE 5

Acquiring long-term knowledge and skill is largely dependent on practice.

PRINCIPLE 6

Clear, explanatory, and timely feedback to children is important for learning.

PRINCIPLE 7

Children's self-regulation assists learning, and self-regulatory skills can be taught.

PRINCIPLE 8

Children's creativity can be fostered.

PRINCIPLE 9

Children tend to enjoy learning and to do better when they are more intrinsically rather than extrinsically motivated to achieve.

PRINCIPLE 10

Children persist in the face of challenging tasks and process information more deeply when they adopt mastery goals rather than performance goals.

PRINCIPLE 11

Teachers' expectations about their students affect children's opportunities to learn, their motivation, and their learning outcomes.

PRINCIPLE 12

Setting goals that are short term (proximal), specific, and moderately challenging enhances motivation more than establishing goals that are long term (distal), general, and overly challenging.

PRINCIPLE 13

Learning is situated within multiple social contexts.

PRINCIPLE 14

Interpersonal relationships and interpersonal communication are critical to both the teaching-learning process and the social development of children.

PRINCIPLE 15

Emotional well-being influences educational performance, learning, and development.

PRINCIPLE 16

Expectations for classroom conduct and social interaction are learned and can be taught using proven principles of behavior and effective classroom instruction.

PRINCIPLE 17

Effective classroom management is based on (a) setting and communicating high expectations, (b) consistently nurturing positive relationships, and (c) providing a high level of support to children.

PRINCIPLE 18

Formative and summative assessments are both important and useful but require different approaches and interpretations.

PRINCIPLE 19

Children's skills, knowledge, and abilities are best measured with assessment processes grounded in psychological science with well-defined standards for quality and fairness.

PRINCIPLE 20

Making sense of assessment data depends on clear, appropriate, and fair interpretation.

INTRODUCTION

Psychological science has much to contribute to enhancing teaching and learning in the classroom. Teaching and learning, in turn, are intricately linked to social and behavioral factors of human development, including cognition, motivation, social interaction, and communication. Psychological science also contributes to effective instruction; classroom environments that promote children's learning; appropriate use of assessment including data, tests, and measurement; as well as research methods that inform practice. We present here the most important principles from psychology, the “Top Twenty,” that would be of greatest use in the context of early childhood teaching and learning as well as applications for each classroom practice. After the description of each principle, relevant supporting research is provided followed by a discussion of the principle's relevance for the classroom.

The authors of this document, the **Coalition for Psychology in Schools and Education**, and APA generally, has been putting psychological science to work for pre-collegiate education for over a decade. Many modules and white papers for teachers are freely available on the APA website (<http://www.apa.org/ed/schools/cpse/>).

The Coalition is an ideal group for translating psychological science for classroom use. Its members collectively represent a wide spectrum of sub-disciplines in psychology including: Evaluation, Measurement, and Statistics; Developmental Psychology; Behavioral Neuroscience and Comparative Psychology; Personality and Social Psychology; the Psychology of Aesthetics, Creativity, and the Arts; Consulting Psychology; Educational Psychology; School Psychology; Counseling Psychology; Community Psychology; Psychology of Women; Media Psychology and Technology; Group Psychology and Group Psychotherapy; Psychological Study of Culture, Ethnicity, and Race; Psychological Study of Men and Masculinity; and Clinical Child, and Adolescent Psychology. Also involved in the Coalition are psychologists representing affiliated communities of educators and scientists, as well as specialists in ethnic minority affairs; testing and assessment; teachers of psychology in secondary schools; children, youth, and families; and psychology honor societies. Coalition members are employed in K-12 schools and in colleges and universities in education, liberal arts, and science divisions. Some members are in private practice or have previous experience within early childhood education. All of the co-authors hold expertise in psychology's application to early childhood, elementary, secondary, or special education.

The Top 20 project was modeled after an earlier effort by APA to identify “Learner-Centered Psychological Principles”

(1997). The Top 20 initiative updates and broadens those principles.

This work of identifying and translating psychological principles was originally developed for use by educators working with all levels of schooling. Although the Top 20 Principles are applicable for all children and adolescents, research in developmental science supports the especially rapid development of brain connections during the early childhood period as well as the central importance of environmental influences on that development. Therefore, the practices and applications employed during this period, particularly with children from ages 3 to 5, may differ from those employed in later development.

We present here the most important principles from psychology - the Top 20 - as identified by the Coalition for Psychology in Schools and Education that would be of greatest use in preschool and kindergarten settings. Science has demonstrated that the early development of cognitive skills as well as emotional well-being are the foundation for later academic achievement, strong social skills, and adult development. Although early childhood sites vary from family child care to community centers to classrooms, the Top 20 Principles can be applied to teaching and learning in all settings. Most important, young children, like older children, learn best when the Top 20 principles included in this document are in place and supported by education directors, administrators, and leaders who oversee the professional development of early childhood educators. We encourage consideration and practice of the Top 20 principles throughout all teacher preparation programs and the workforce development of early childhood professionals to ensure a solid foundation of psychological knowledge be incorporated in the teaching of young children.

METHODOLOGY

The method to derive the original “Top Twenty” principles was as follows. First, the Coalition, operating in the mode of an NIH Consensus Panel, engaged in a series of thought exercises where each member identified two constructs or “kernels” (Embry & Biglan, 2008) from psychology thought to be most essential for facilitating successful classroom teaching and learning. This process led to the identification of approximately 45 kernels/principles.

Next, a series of steps was taken to categorize, validate, and consolidate these principles. The first step was to cluster the 45 principles according to key domains of classroom application (e.g., How do children think and learn?) followed by an iterative process across several meetings of the Coalition. Second, the Coalition established a validation procedure for the 45 principles that involved analyzing several national blueprint publications related to teaching so as to assess whether each of the principles was identified by the broader community of educators as critical to teacher practice. These documents included APA’s Standards for High School Curriculum in Psychology, the PRAXIS Principles of Learning and Teaching examination from the Educational Testing Service, documents from the National Council for the Accreditation of Teacher Education (NCATE), InTASC (The Interstate Teacher Assessment and Support Consortium) Standards, a popular educational psychology textbook, and the National Association of School Psychologists’ Blueprint for Training and Practice.

The next step was to use a modified Delphi process (modeled after a 2004 report from the Institute of Medicine entitled, *Improving Medical Education: Enhancing the Behavioral and Social Science Content of Medical School Curricula*) to identify the most important of the 45 principles/kernels. Coalition members rated each of the principles using a scale system and assigned each a high, medium, or low priority score (1-3). Based on the mean

scores, low priority principles were discarded leaving 22 principles. These were then analyzed for their relation to each other and were synthesized into the final 20 presented here.¹

These “Top Twenty” were then placed into five areas of psychological functioning. The first eight (1-8) relate to cognition and learning and address the question of, **“How do students think and learn?”** The next four principles (9-12) discuss motivation and address the question, **“What motivates students?”** The following three (13-15) pertain to the social context and emotional dimensions that affect learning and address the query, **“Why are social context, interpersonal relationships, and emotional well-being important to student learning?”** The next two principles (16-17) relate to how context can affect learning and address the query, **“How can the classroom best be managed?”** Finally, the last three principles (18-20) discuss assessment and address the question, **“How can teachers assess a student’s progress?”**

To support the needs of the early childhood community, a panel with expertise in psychology and early childhood education then translated each principle for early childhood and incorporated relevant evidence on early childhood education practices, resulting in this document.

EARLY CHILDHOOD REFERENCES

- Institute of Medicine and National Research Council.
2015. Transforming the Workforce for Children Birth through Age 8: A Unifying Foundation. Washington, DC: The National Academies Press. <https://doi.org/10.17226/19401>.
- National Scientific Council on the Developing Child.
(2007). The science of early childhood development (2007). <https://developingchild.harvard.edu/resourcecategory/reports-and-working-papers/>

REFERENCES FROM ORIGINAL TOP 20¹

- American Psychological Association, Learner-Centered Principles Work Group. (1997). Learner-centered psychological principles: A framework for school reform and design. Retrieved from <http://www.apa.org/ed/governance/bea/learner-centered.pdf>
- Benassi, V.A., Overson, C.E., & Hakala, C.M. (Eds.) (2014). Applying the science of learning in education: Infusing psychological science into the curriculum. Retrieved from the Society for the Teaching of Psychology website: <http://teachpsych.org/ebooks/asle2014/index.php>
- Council of Chief State School Officer's Interstate Teacher Assessment and Support Consortium (InTASC). (2011). Model core teaching standards: A resource for state dialogue. Retrieved from InTASC website: http://www.ccsso.org/Documents/2011/InTASC_Model_Core_Teaching_Standards_2011.pdf
- Cuff, P.A., & Vanselow, N.A. (Eds.) (2004). Enhancing the behavioral and social sciences in medical school curricula. Washington DC: The National Academies Press.
- Dunlosky, J., Rawson, K.A., Marsh, E.J., Nathan, M.J., & Willingham, D.T. (2013). Improving students' learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest*, 14, 4-58.
- Embry, D. D., & Biglan, A. (2008). Evidence-based kernels: Fundamental units of behavioral influence. *Clinical Child and Family Psychology Review*, 11(3), 75-113.
- Roediger, H.L. (2013). Applying cognitive psychology to education: Translational education science. *Psychological Science in the Public Interest*, 14, 1-3.
- Whitlock, K. H., Fineburg, A. C., Freeman, J. E., & Smith, M. T. (2005). National standards for high school psychology curricula. Retrieved from APA's policy website: <http://www.apa.org/about/policy/high-school-standards.pdf>
- Woolfolk, A. (2013). Educational Psychology, Old Tappan, New Jersey: Prentice Hall PTR.
- Ysseldyke, J., Burns, M., Dawson, P., Kelley, B., Morrison, D., Ortiz, S., Rosenfield, S., & Telzrow, C. (2006). School psychology: A blueprint for training and practice III. Retrieved from the National Association of School Psychologists' website: <http://www.nasponline.org/resources/blueprint/finalblueprintinteriors.pdf>
- Zinkiewicz, L., Hammond, N., & Trapp, A. (2003). Applying psychology disciplinary knowledge to psychology teaching and learning: A review of selected psychological research and theory with implications for teaching practice. York, UK: University of York

¹ "Original Top 20" refers to the *Top 20 Principles from Psychology for PreK-12 Teaching and Learning* available at <https://www.apa.org/ed/schools/teaching-learning/top-twenty-principles.pdf>

How do Children Think and Learn?

PRINCIPLE 1 Children's beliefs or perceptions about intelligence and ability affect their cognitive functioning and learning.

EXPLANATION

Children develop beliefs about intelligence. Some children learn that intelligence is a fixed trait or an "entity." That is, people have a certain amount of intelligence, and this amount does not change. This perception of intelligence is labeled as a "fixed" or an "entity mindset." Other children believe that intelligence is malleable or changeable, a "growth" or "incremental mindset," and that with effort, practice, and better strategies they can become smarter. Children's mindsets may vary by situation or context and may be affected by cultural differences.

There are educational implications for each of these mindsets. Children who have a fixed mindset tend to focus on their performance, thinking that those who can do tasks quickly are more intelligent than those who take their time. These children may want to demonstrate and prove their intelligence, and to look smart in others' eyes. These children are subsequently more reluctant to take on challenges and are more resistant to constructive feedback. In contrast, children with a growth mindset are generally more willing to engage in challenging tasks that test and expand their intelligence. Hence, they rebound more easily

from negative feedback and failure and may even see these setbacks as opportunities for learning.

Fostering a growth mindset can be framed in terms of attributions teachers assign to children's performance. When children experience failure, they may wonder "Why?" The answer to that question is what is called a causal attribution. Attributions that tend to blame one's ability ("I failed because I'm just not smart enough") are associated with the view that intelligence is fixed. In contrast, attributions that blame lack of effort ("I failed because I didn't try hard enough") or the use of an inappropriate strategy generally reflect a growth or incremental view of intelligence. Attributing a child's poor performance to controllable and modifiable causes, such as lack of effort or the poor choice of a strategy, gives children the expectation or hope that things can be different in the future.

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Teachers can foster children's beliefs that their intelligence and ability can be developed through effort and exercising various strategies:

- In addition to academic tasks with multiple approaches, teachers should provide young children with different types of play opportunities that help them learn to solve problems in different ways. For example, children who try to build a very tall tower with building blocks probably will encounter failure at some point. However, when challenged to see if they can figure out a different way of building that will result in a taller tower, those

same children may persist with numerous attempts. When a child is successful at building a taller tower, the teacher can point out the change in strategy that made that tower taller (e.g., the child made a larger base to hold the taller blocks) and can praise the child's effort and persistence in trying different ways to build a taller structure. Giving specific praise (e.g., "You found a new way to stack the blocks!" or "You worked hard to figure out the best answer") is better than giving only general praise (e.g., "Good job" or "That's right."). (See principle 6)

- Teachers should give children tasks that provide them with some challenge. Solely giving young children tasks that have single answers and can be completed quickly will not help them to pursue more complex tasks in the future. Instead, teachers should give children tasks that elicit multiple approaches for solving them. This helps children to learn to approach problems using different strategies or methods.
- When given a choice of tasks, children with a "fixed" mindset generally choose the tasks that they perceive to be the easiest. They may want to show through their quick performance that they are "smart." Consequently, these children may not learn as much in the long-term, because they may tend to avoid tasks that are challenging. This phenomenon is likely to occur during school transitions (e.g., pre-K to Kindergarten). Thus, teachers should be aware of choices children make and encourage each child to pursue experiences that challenge them (e.g., working harder to get smarter).
- Teachers can recognize children's improvement in their performance over time. In early childhood settings, a teacher can reframe a challenge to help children see their progress rather than their immediate ability to meet a performance benchmark. For example, if children are expected to identify all letters of the alphabet, instead of testing children on letters in isolation and indicating whether they are correct or incorrect, the teacher could keep records of children's letter naming in natural classroom contexts over time. The mastery goal would be framed as "Last time, you found 5 letters you could name. Let's see if you can find 6 letters you know this time." (See principle 10)
- Teachers should be careful not to give indirect and subtle cues about low ability (see principle 11). They can unintentionally communicate a child's low ability when they attempt to protect the self-esteem of children who are less secure about their ability. For example, if teachers praise children who have lower academic

skills for tasks that are easy for them, this praise may undermine those children's motivation and success in the future. This praise suggests a child does not have the ability to succeed at a more difficult task (e.g., "Why is my teacher praising me for getting these easy problems right?"). Likewise, unsolicited assistance and sympathy may communicate the teacher's belief that the child does not have the ability to be successful.

- Teachers should monitor situations in which children expend minimal, modest, or incomplete effort when presenting children with challenging materials and tasks. This self-handicapping may reflect a child's fear of embarrassment or failure ("If I don't even try, people will not think I'm dumb if I fail").

To be clear, we are not suggesting that teachers should never praise or help children, or that they should always express disappointment (rather than sympathy) or offer constructive criticism (rather than compliments). The appropriateness of any feedback will depend on many factors based on teacher judgment of the situation. Children come to school with mindsets and ideas about intelligence that may be the result of parents' feedback or past interactions with teachers or caregivers that do not manifest exclusively from classroom interactions. The general message is that attribution principles help to explain how some well-intentioned teacher or parent behaviors may have unexpected, or even negative, effects on children's beliefs about their own abilities. Additionally, recent research suggests that mindset related educational interventions are particularly effective in special populations such as children who are at risk academically.

REFERENCES FOR EARLY CHILDHOOD

- Cimpian, A., Hammond, M. D., Mazza, G., Corry, G. (2017). Young children's self-concepts include representations of abstract traits and the global self. *Child Development*, 88, 1786-1798. doi:10.1111/cdev.12925
- Cimpian, A., & Erickson, L. (2012). The effect of generic statements on children's causal attributions: Questions of mechanism. *Developmental Psychology*, 48, 159-170. doi:10.1037/a0025274
- Gallinsky, E. (2010). Skill six: Taking on challenges. In E. Gallinsky, *Mind in the making: The seven essential life skills every child needs* (Ch. 6, pp. 248-297). New York, NY: HarperCollins.
- Gunderson, E. A., Gripshover, S. J., Romero, C., Dweck, C. S., Goldin-Meadow, S., & Levine, S. C. (2013). Parent praise to 1- to 3-year-olds predicts children's motiva-

tional frameworks 5 years later. *Child Development*, 84, 1526-1541. doi:10.1111/cdev.12064

Sisk, V. F., Burgoyne, A. P., Sun, J., Butler, J. L., & Macnamara, B. N. (2018). To what extent and under which circumstances are growth mind-sets important to academic achievement? Two meta-analyses. *Psychological Science*, 29, 549-571.

REFERENCES FROM ORIGINAL TOP 20

Aronson, J., Fried, C., & Good, C. (2002). Reducing the effects of stereotype threat on African American college students by shaping theories of intelligence. *Journal of Experimental Social Psychology*, 38, 113-125. doi:10.1006/jesp.2001.1491

Aronson, J., & Juarez, L. (2012). Growth mindsets in the laboratory and the real world. In R. F. Subotnik, A. Robinson, C. M. Callahan, & E. J. Gubbins (Eds.), *Malleable minds: Translating insights from psychology and neuroscience to gifted education* (pp. 19-36). Storrs, CT: National Research Center on the Gifted and Talented.

Blackwell, L. S., Trzesniewski, K. H., & Dweck, C. S. (2007). Implicit theories of intelligence predict achievement across an adolescent transition: A longitudinal study and an intervention. *Child Development*, 78, 246-263. doi:10.1111/j.1467- 8624.2007.00995.x

Dweck, C. S. (2017). The journey to children's mindsets --- and beyond. *Child Development Perspectives*, 11, 139-144. doi:10.1111/cdep.12225

Good, C., Aronson, J., & Inzlicht, M. (2003). Improving adolescents' standardized test performance: An intervention to reduce the effects of stereotype threat. *Journal of Applied Developmental Psychology*, 24, 645-662. doi: [org/10.1016/j.appdev.2003.09.002](https://doi.org/10.1016/j.appdev.2003.09.002)

PRINCIPLE 2 What children already know affects their learning.

EXPLANATION

Children bring their previous knowledge and experiences into their early childhood classrooms. Previous knowledge is a result of children's everyday experiences at home, in childcare settings, in their community, or from social interactions with their family or friends. Prior knowledge influences how young children incorporate new knowledge and what they learn from new experiences. **Accordingly, learning consists of either adding to existing knowledge, which is known as conceptual growth; or transforming or revising knowledge, known as conceptual change.**

Conceptual growth occurs when children's previous knowledge is consistent with new knowledge. In this case, children simply incorporate additional knowledge about the topic into their existing understanding. Conceptual change is required when children must transform or revise previous knowledge because what they already know is not consistent with new information, or when children's prior knowledge is erroneous. This might occur because children have misconceptions or false beliefs about how things work in the world. Conceptual growth is far easier than conceptual change. Many common misconceptions are held by both children and adults, particularly in areas such as mathematics and science. It is imperative for children to experience conceptual change for concepts that are misunderstood, but misconceptions can be particularly resistant to change. Understanding children's knowledge about a topic – including misconceptions – can help teachers to plan instruction.

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Teachers can be instrumental in achieving both conceptual growth and conceptual change in children.

- Teachers should assess children's current level of knowledge and previous experience (i.e., conduct "formative assessment" (see Principle 18) before they begin teaching a topic. Examples can include the following: 1) asking young children to draw a picture that shows what they know about the topic; 2) having each child tell something about the topic while writing what each child said on chart paper; 3) having a whole

group discussion about the topic; or 4) having a child demonstrate a procedure to the class.

- When young children do not have sufficient first-hand or background knowledge about a topic, teachers should provide activities that present background information before they teach new information. For example, if children are supposed to learn about plant growth, it may be important for children to plant flowers (or participate in another culturally- or environmentally-relevant experience) and to observe their growth over time. While planting these flowers, measurement concepts and vocabulary can be introduced. Children also can learn that plants need sunlight and water. They can observe what happens if some plants are not watered while others do not have sunlight. Notably, new information that is meaningful becomes more memorable.
- Teachers can have children play an active role in predicting outcomes or solutions and then show the actual results. This is especially important if the children's predictions are faulty. For example, in a read-aloud, the teacher might ask children, "What do you think will happen next?" and "Why do you think that might happen?"
- Teachers can present children with credible information or data that run counter to their misconceptions. For example, if a child has a misconception about the shape of the Earth (e.g., it has an edge and people can fall off it), depending on children's ages, teachers can provide physical evidence (e.g., a globe) to correct the child's misconception or visit a planetarium exhibit on the solar system.

EARLY CHILDHOOD REFERENCES

- Shonkoff, J. P., & Phillips, D. A. (2000). From neurons to neighborhoods: *The science of early childhood development*. National Academy of Sciences National Research Council, Washington, DC.
- Schneider, W. (2015). *Memory development from early childhood through emerging adulthood*. Springer: Switzerland. doi:10.1007/978-3-319-09611-7
- Vosniadou, S., & Brewer, W. F. (1992). Mental models of the earth: A study of conceptual change in childhood. *Cognitive Psychology*, 24(4), 535-585.

REFERENCES FROM ORIGINAL TOP 20

- Eryilmaz, A. (2002). Effects of conceptual assignments and conceptual change discussions on students' misconceptions and achievement regarding force and motion. *Journal of Research in Science Teaching*, 39, 1001-1015. doi.org/10.1002/tea.10054
- Holding, M., Denton, R., Kulesza, A., & Ridgway, J. (2014). Confronting scientific misconceptions by fostering a classroom of scientists in the introductory biology lab. *American Biology Teacher*, 76, 518-523.
- Johnson, M., & Sinatra, G. (2014). The influence of approach and avoidance goals on conceptual change. *Journal of Educational Research*, 107, 312-325. doi:10.1080/00220671.2013.807492
- Mayer, R. E. (2011). *Applying the science of learning*. Boston, MA: Pearson.
- Pashler, H., Bain, P. M., Bottge, B. A., Graesser, A., Koedinger, K. R., McDaniel, M., & Metcalfe, J. (2007). *Organizing instruction and study to improve student learning* (NCER 2007-2004). Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Research. Retrieved from <http://ies.ed.gov/ncee/wwc/practiceguide.aspx?sid=1>
- Savinainen, A., & Scott, P. (2002). The Force Concept Inventory: A tool for monitoring student learning. *Physics Education*, 37, 45-52.

PRINCIPLE 3 Children's cognitive development and learning are not limited by general stages of development.

EXPLANATION

Children's reasoning is not limited or determined by underlying stages of cognitive development. That is, stages of development are not linked to a particular age or grade level. Historically, many people have identified development as progressing through a number of fixed stages and at fixed ages. For example, theories have proposed that preschool children have difficulty taking the perspective of others while elementary aged children do not have this difficulty. However, researchers generally find that these developmental stages are more descriptive about the ability to demonstrate these skills rather than how the skills themselves transform through stages. For example, although

preschool aged children have more difficulty taking the perspective of others, they can learn to take others' perspectives with assistance.

Contextualist approaches to cognitive development and learning describe how context affects cognition. Children's reasoning can be facilitated to more advanced levels when they interact with more capable others and/or with more advanced materials. This strategy is especially effective when materials are pitched neither too near nor too far from children's current level of functioning. This principle is captured in what is called the *Zone of Proximal Development* – tasks that a child can achieve with questions or other support. Contextualist approaches also support the idea that cognition can be “situated.” That is, learning is conceived as participation in communities, with children progressively acquiring situated actions. For example, in some societies, children learn to farm, acquire a craft, or absorb how to adapt to societal expectations.

In sum, children are capable of higher-level thinking and behavior when:

- There is some biological base (early competency) for knowledge in the domain,
- They already have some familiarity or expertise with a knowledge domain,
- They interact with more capable others or with challenging materials, and
- They are in sociocultural contexts from which they become familiar with that topic through experience.

Conversely, when children are not familiar with particular knowledge in a domain, are not challenged by the interpersonal context or learning materials, or are in a context for learning that is too unfamiliar to them, their reasoning may be less sophisticated.

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Children come into early childhood settings with different skills, backgrounds, and prior knowledge. It is important that teachers assess what children already know and how familiar the children are with the context of the information or skill before proceeding with instruction. Children's prior knowledge can help to determine which instructional experiences might be appropriate and relevant, but age is not the main or sole determiner of what a child is capable

of knowing or reasoning.² In designing instruction, teachers can facilitate children's reasoning in the following ways:

- Teachers should encourage children's reasoning in knowledge domains and contexts where they already have knowledge and interest. For example, a child who is very interested and familiar with dinosaurs may be able to sort, classify, and tell a great number of facts about many different dinosaurs. That same child may not have any familiarity with plants, and it may not be possible for him or her to do the same activities with different types of plants.
- Although children generally reason better when dealing with highly familiar topics, their reasoning can be enhanced in less familiar arenas when presented with topics and domains pitched just beyond their current level of functioning. The perfect level of entry for new material is providing information that is not too elementary to be easily understood and not too complex to be out-of-range of understanding even with assistance. For example, if children already can tell the order of activities in the classroom day, a teacher could then ask them think about how similar sequencing applies to story book reading. Children's reasoning can also be facilitated by familiarizing them with the culture of classrooms and schooling practices. Although not all classroom activities can be approached by relying on peer collaboration, when possible this approach can help children whose background experiences make them unfamiliar with schooling and classroom practices in the United States. These children may need an assigned “buddy” to help them to navigate the culture of school.
- Placing children in mixed-ability groups for learning allows for interaction with children who have different abilities and problem-solving approaches. This is also an important rationale for inclusive early childhood education—that is, including children with and without disabilities in the same classroom. Children already at very high-levels of functioning should also be stimulated to even higher levels by interacting with still more advanced peers or with instructors and by use of advanced learning materials.

EARLY CHILDHOOD REFERENCES

Bjorklund, D. F. (1997). In Search of a Metatheory for Cognitive Development (or, Piaget Is Dead and I Don't Feel

2 See also <http://www.apa.org/education/k12/brain-function.aspx>

So Good Myself). *Child Development*, 68(1), 144-148. <https://doi.org/10.1111/j.1467-8624.1997.tb01932.x>

Bjorklund, D. F. (2018). Commentary: A Metatheory for Cognitive Development (or “Piaget is Dead” Revisited). *Child Development*, 89(6), 2288-2302. <https://doi.org/10.1111/cdev.13019>

Flavell, J. H., Miller, P. H., & Miller, S. A. (1985). *Cognitive development* (3rd ed.). Englewood Cliffs, NJ: Prentice Hall.

REFERENCES FROM ORIGINAL TOP 20

Bjorklund, D. F. (2012). *Children's thinking: Cognitive development and individual differences* (5th ed.). Belmont, CA: Wadsworth.

Donaldson, M. (1978). *Children's minds*. W. W. Norton and Company: New York.

Mayer, R. (2008). *Learning and instruction*. Upper Saddle River, NJ: Pearson.

Miller, P. H. (2011). *Theories of developmental psychology* (5th ed.). New York: Worth Publishers.

Rogoff, B. (2003). *The cultural nature of human development*. New York: Oxford.

PRINCIPLE 4 Learning is based on context, so generalizing learning to new contexts is not spontaneous but instead needs to be facilitated.

EXPLANATION

Learning occurs within multiple contexts. These contexts can focus on one of several domains of learning such as cognitive domains (e.g., mathematics development and scientific reasoning), visual-spatial domains (e.g., pattern recognition, eye-hand coordination), or social domains, including relationships with adults and other children (e.g., caretaking routines between a parent and child, interactions between children during free play). **Children do not automatically transfer or generalize their knowledge from one context or situation to new contexts or situations. In fact, the more dissimilar the new context is from the original learning context, the more difficulty children will experience.** Deeper understanding of concepts results from adapting skills and content to new contexts. Most notably, transfer skills can be learned through encouragement and support from teachers.

Children's ability to transfer learning is an important indicator of the quality of their learning – its depth, adaptability, and flexibility.

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

In early childhood, children learn in a variety of contexts. The challenge is for teachers to provide children with opportunities to transfer their knowledge and form connections across different contexts – from highly similar to highly dissimilar contexts. This can be achieved by the following:

- Asking children to make connections between what they learn at school and their lives at home. “When your family buys food, how do you use numbers?” “Where have you seen letters on your way to school?”
- Helping children see the application of their knowledge to the real world (e.g., using addition and subtraction to understand the cost of purchases in stores) or assisting them in transferring real-world knowledge when trying to understand academic principles. Teachers can help children to generalize/apply their knowledge by regularly providing real-life instances of the academic behaviors in which they are engaged.
- Identifying and building on strengths and experiences that children bring to a learning situation. One way to do this would be by taking a walk to a relevant place and asking questions about surroundings. For example, ask children what questions they would want to ask a person working at a local grocery store.

EARLY CHILDHOOD REFERENCES

Chen, J., & McNamee, G. (2011). Positive approaches to learning in the context of preschool classroom activities. *Early Childhood Education Journal*, 39(1), 71-78.

Colliver, Y., & Flee, M. (2016). ‘I already know what I learned’: Young children's perspectives on learning through play. *Early Child Development and Care*, 186(10), 1559-1570. doi:10.1080/03004430.2015.1111880 <http://www.tandfonline.com/doi/abs/10.1080/03004430.2015.1111880?journalCode=g-ecd20>

Moreno, A. J., Shwayder, I., & Friedman, I. D. (2017). The function of executive function: Everyday manifestations of regulated thinking in preschool settings. *Early Child-*

hood Education Journal, 45(2), 143-153. doi:10.1007/s10643-016-0777-y

<http://web.a.ebscohost.com/ehost/SmartLink/OpenE-jsSmartLink?sid=0ab88d92-f675-4ec9-8445-f267d08b-1cb9@sessionmgr4006&vid=26>

Timmons, K., Pelletier, J., & Corter, C. (2016). Understanding children's self-regulation within different classroom contexts. *Early Child Development and Care*, 186(2), 249-267. doi: 10.1080/03004430.2015.1027699

REFERENCES FROM ORIGINAL TOP 20

Bransford, J. D., Brown, A. L., & Cocking, R. (Eds). (2000). *How people learn*. Washington, DC: National Academies Press.

Mayer, R. (2008). *Learning and instruction*. Upper Saddle River, NJ: Pearson.

Saxe, G. B. (1991). *Culture and cognitive development: Studies in mathematical understanding*. Hillsdale, NJ: Erlbaum.

Sousa, D. A. (2011). *How the brain learns* (4th ed.). Thousand Oaks, CA: Corwin.

PRINCIPLE 5 Acquiring long-term knowledge and skill is largely dependent on practice.

EXPLANATION

What children know (their knowledge base) is etched into long-term memory. Most information, particularly when related to school-based knowledge and highly skilled activities (e.g., such as learning to play a musical instrument or produce patterns of shapes), must be processed in some way before being stored in long-term memory. At any given moment, children are surrounded by an enormous amount of information. They will not process most of the information, because they attend and process some information with a limited-capacity memory storage area known as short-term or working memory. To be retained more permanently, information must be transferred into long-term memory, which, by definition, is of relatively long duration (e.g., decades), has very large capacity, and is highly organized (e.g., categorized). The transfer of information from short-term to long-term memory occurs

when children use different strategies, and practice is key to this transfer process.³

Studies comparing the performance of experts and novices have shown important distinctions between purposeful practice and other activities, such as play or “drill and kill” repetition. Rote repetition—simply repeating a task—does very little by itself to improve performance or long-term retention of content. **Instead, purposeful practice involves attention, rehearsal, and repetition over time and leads to new knowledge or skills that can later be developed into more complex knowledge and skills.**

Overall, there are at least five ways learning is improved through rehearsal and deliberate practice. Evidence demonstrates that: (a) the likelihood that learning will be long term and retrievable is increased, (b) children's ability to apply elements of knowledge automatically and without reflection is enhanced, (c) skills that become automatic free up children's cognitive resources for learning more challenging tasks, (d) transfer of practiced skills to new and more complex problems is increased, and (e) gains often bring about motivation for more learning.

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Engaging children in practice can be elicited and encouraged in a variety of ways. Because practice requires intense, focused effort, children may not find it inherently enjoyable; therefore, teachers need to encourage children to practice by pointing out that expending effort leads to improved performance.

Teachers can help support and motivate children to engage in practice by expressing confidence in their ability to do well at solving problems. For example, they can scaffold activities that maximize children's opportunities to succeed. Unrealistic or poorly designed classroom challenges may lead to frustration and decrease children's motivation to learn. Practicing routine events across multiple contexts provides children with the opportunity to generalize knowledge and ensures long-term retention (see Principle 4). Some examples that early childhood educators can use to ensure the acquisition of long-term knowledge are as follows:

- Rote learning experiences can be incorporated into everyday activities such as transitions. For example,

3 See also <http://www.apa.org/education/k12/practice-acquisition.aspx>

singing a song about a transition activity while performing those activities can help children engage in the transition activities more easily. (e.g., “Wash your hands before you eat; wash your hands; wash your hands. Wash your hands before you eat. Wash your hands.”)

- Teachers should support young children’s learning in multiple contexts whenever possible, not just in the classroom. For example, to strengthen letter knowledge, a teacher might point out different objects that all begin with the same letter during a neighborhood walk (bus, birds, bench) and ask with which letter they all begin. Or, if children are learning about transportation, teachers could go on walks with children and have them identify all the different modes of transportation they see and discuss what they notice.
- To practice understanding shapes and patterns, teachers could use pattern cards that need to be put in sequence. Children can be asked to extend a pattern or series by asking what shape would follow the last shape shown on the card. Or in group activities, teachers could work with children using different toys that children enjoy and use often in different activities (for example, colored pegs) to create their own patterns and have them explain the pattern they’ve created.
- When teachers go over the days of the week using a song or other mnemonic with children, a teacher could ask, “If yesterday was Tuesday, what day is it today?” While singing the days of the week song is rote repetition, children will have to think back to the song when trying to figure out the current day. This can occur regularly.
- Teachers could use music and movement activities to help children acquire long-term knowledge through songs, which physically engage children. For example, a teacher might have children learn about and remember parts of their body as well as different movements by playing, “The Beanbag Boogie,” which instructs children where to place their individual bean bag without letting it fall and incorporates movements such as jumping and stomping.

EARLY CHILDHOOD REFERENCES

Committee on the Science of Children Birth to Age 8: Deepening and Broadening the Foundation for Success; Board on Children, Youth, and Families; Institute of Medicine; National Research Council; Allen LR, Kelly BB, editors. Transforming the Workforce or Children Birth Through Age 8: A Unifying Foundation. Washington (DC): National Academies Press (US); 2015 Jul 23. 4,

Child Development and Early Learning. Available from: <https://www.ncbi.nlm.nih.gov/books/NBK310550/>

National Center on Early Childhood Development, Teaching, and Learning (nd). The science of child development and learning. Retrieved from <https://eclkc.ohs.acf.hhs.gov/sites/default/files/pdf/science-child-development-learning.pdf>.

Vitiello, V. E., & Greenfield, D. B. (2017). Executive functions and approaches to learning in predicting school readiness. *Journal of Applied Developmental Psychology*, 53, 1–9. <https://doi.org/10.1016/j.appdev.2017.08.004>

REFERENCES FROM ORIGINAL TOP 20

Campitelli, G., & Gobet, F. (2011). Deliberate practice: Necessary but not sufficient. *Current Directions in Psychological Science*, 20(5), 280–285. doi:10.1177/096372141142922

Dunlosky, J., Rawson, K. A., Marsh, E. J., Nathan, M. J., & Willingham, D. T. (2013). Improving students’ learning with effective learning techniques: Promising directions from cognitive and educational psychology. *Psychological Science in the Public Interest*, 14, 4–58. doi:10.1177/1529100612453266

Roediger, H. L. (2013). Applying cognitive psychology to education: Translational education science. *Psychological Science in the Public Interest*, 14, 1–3. doi:10.1177/1529100612454415

Rosenshine, B., & Meister, C. (1992). The use of scaffolds for teaching higher-level cognitive strategies. *Educational Leadership*, 49(7), 26–33.

Simkins, S. P., & Maier, M. H. (2008). Just-in-time teaching: *Across the disciplines, across the academy*. Sterling VA: Stylus.

van Merriënboer, J. J. G., Kirschner, P. A., & Kester, L. (2003). Taking the load off a learner’s mind: Instructional design for complex learning. *Educational Psychologist*, 38, 5–13. doi:10.1207 /s15326985EP3801_2

PRINCIPLE 6 Clear, explanatory, and timely feedback is important for learning.

EXPLANATION

Learning can increase when children receive regular, specific, explanatory, and timely feedback on their work. Feedback that is occasional and perfunctory (e.g., saying

‘good job’) is neither clear nor explanatory and does not increase children's motivation or understanding. Clear learning goals help to increase the effectiveness of feedback to children because the comments can tie directly to the goals, and regular feedback prevents children from getting off track in their learning.

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

The feedback that teachers offer can be most effective when it provides children with specific information about their current state of knowledge and performance as related to learning goals. Providing feedback in a timely way (e.g., as quickly as possible after an activity) assists learning and is usually more effective than providing delayed feedback. For example:

- Teachers can provide feedback to children incorporating earlier learning with current learning goals. For example, rather than general remarks such as “Good job,” or “You seem to be struggling,” teachers can make more directed comments, such as “To cut along the line, you’re going to need to have the scissors open wider and cut more slowly.”
- Feedback affects motivation (see Principle 11). Children tend to respond better if feedback minimizes negativity and focuses on what they might wish to change. For example, when a child cuts out a shape and the scissors no longer are cutting on the line of that shape, the teacher might point to the place where the child had been cutting on the line and encourage the child to hold the scissors the same way for cutting out the rest of the shape.
- When children are learning a new task or struggling with an existing one, frequent praise following small degrees of improvement is very important, and when progress is evident, encouragement to persist can matter a great deal. Targeted feedback can also motivate children to continue practicing a new skill (see Principle 5, and also see Using Classroom Data to Give Systematic Feedback to Students to Improve Learning <http://www.apa.org/education/k12/classroom-data.aspx>).

EARLY CHILDHOOD REFERENCES

Burnett, P. C. (2002). Teacher praise and feedback and students' perceptions of the classroom environment. *Educational psychology*, 22(1), 5-16.

Conroy, M. A., Sutherland, K. S., Snyder, A., Al-Hendawi, M., & Vo, A. (2009). Creating a Positive Classroom Atmosphere: Teachers' Use of Effective Praise and Feedback. *Beyond Behavior*, 18(2), 18-26.

Hintz, R., & Driscoll, A. (1988). Praise or encouragement? New insights into praise: Implications for early childhood teachers. *Young Children*, 16, 6-13.

Kohn, A. (2001). Five Reasons to Stop Saying "Good Job". *Young Children*, 56(5), 24-30.

Lam, S. F., Yim, P. S., & Ng, Y. L. (2008). Is effort praise motivational? The role of beliefs in the effort-ability relationship. *Contemporary Educational Psychology*, 33(4), 694-710.

REFERENCES FROM ORIGINAL TOP 20

Brookhart, S. M. (2008). *How to give effective feedback to your students*. Alexandria, VA: Association for Supervision and Curriculum Development.

Ericsson, A. K., Krampe, R. T., & Tesch-Romer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, 100(3), 363-406.

Gobet, F., & Campitelli, G. (2007). The role of domain-specific practice, handedness, and starting age in chess. *Developmental Psychology*, 43(1), 159-172.

Leahy, S., Lyon, C., Thompson, M., & Wiliam, D. (2005, November). Classroom assessment, minute by minute, day by day. *Educational Leadership*, 63(3), 19-24.

Minstrell, J. (2001). The role of the teacher in making sense of classroom experiences and effecting better learning. In Carver, S. M., & Klahr, D. (Eds.) *Cognition and instruction: Twenty-five years of progress* (pp. 121-150). Mahwah, NJ: Lawrence Erlbaum Associates.

PRINCIPLE 7 Children’s self-regulation assists learning, and self-regulatory skills can be taught.

EXPLANATION

Self-regulation refers to sets of skills that facilitate goal-directed behavior including the ability to inhibit impulsive behavior, control one’s emotions, and solve problems. It is often conceptualized as encompassing executive function skills including attending to what’s relevant (e.g., the teacher reading a book) and ignoring what’s not relevant at that time (e.g., the assistant teacher preparing lunch at

the back of the room). In the early childhood classroom, self-regulatory skills allow children to pay attention to the teacher, follow directions, and manage behavior so they can learn. **These skills can be taught or enhanced, specifically through direct instruction, modeling, support, and classroom organization and structure.** Children who show more of these skills at the end of preschool tend to do better in school later on.

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Although these skills develop naturally to some extent during the preschool years, early childhood educators play a role in helping children to acquire them. The classroom environment can be organized to enhance self-regulation. Some researchers have compared self-regulation to a muscle, which can become tired with use, but with practice can also get stronger over time. Researchers have identified several ways that teachers can promote self-regulation and executive functioning skills in children:

- The words we use to guide children's behavior are important. Giving children some autonomy and including them in decision-making about their behavior (e.g., "Do you want to pick up the blocks or wash the paint brushes?") is better for promoting executive functioning than just giving children explicit directions (e.g., "Pick up the blocks."). When teachers engage children in challenging, goal-directed activities that are fun (e.g., completing a puzzle), they can ask them leading questions (e.g., "Should we start at the top or the bottom?" "Which piece do you think goes there?") rather than only telling them what to do.
- Giving children practice modulating their motor behavior through song and dance helps to build the self-regulatory "muscle." For example, games synchronized with music and others moving in the same way (e.g., stop-go, high-low, fast-slow, loud-soft) helps to build executive function skills in young children. More generally, play that involves moderate to vigorous physical activity (e.g., outside recess) is also associated with increases in children's self-regulation.
- When children engage in pretend play (e.g., playing doctor or chef), the role they take on places rules and limits on their behavior – what they can and cannot do or say. Conforming to such rules gives children practice regulating their behavior. This helps them develop their executive function skills.
- Preschool children's executive function skills can also be enhanced through mindfulness practices, such as deep breathing, focused listening and attention, and body/emotion self-monitoring and self-awareness exercises.
- Friendly, warm, and positive teacher-child interactions and strong emotional connections between teachers and children improve children's behavioral control in preschool, especially for those entering preschool with poor regulatory skills. An organized classroom environment with clear, consistent expectations, rules, and routines can also help enhance children's self-regulation.⁴

EARLY CHILDHOOD REFERENCES

- Ackerman, D.J., & Friedman-Krauss, A.H. (2017). Preschoolers' executive function: Importance, contributors, research needs and assessment options. *ETS Research Report Series*, 2017(1), 1–24. doi: 10.1002/ets2.12148
- Center on the Developing Child at Harvard University (2014). *Enhancing and practicing executive function skills with children from infancy to adolescence*. Retrieved from: <https://developingchild.harvard.edu/resources/activities-guide-enhancing-and-practicing-executive-function-skills-with-children-from-infancy-to-adolescence/>
- Choi, J. Y., Castle, S., Williamson, A. C., Young, E., Worley, L., Long, M., & Horm, D. M. (2016). Teacher-child interactions and the development of executive function in preschool-age children attending Head Start. *Early Education and Development*, 27(6), 751–769. doi: 10.1080/10409289.2016.1129864
- Jones, S. M., Bailey, R., Barnes, S. P., & Partee, A. (2016). Executive function napping project: *Untangling the terms and skills related to executive function and self-regulation in early childhood*. OPRE Report # 2016-88, Washington, DC: Office of Planning, Research and Evaluation, Administration for Children and Families, U.S. Department of Health and Human Services.
- McClelland, M. M., Acock, A. C., Piccinin, A., Rhea, S. A., & Stallings, M. C. (2013). Relations between preschool attention span-persistence and age 25 educational outcomes. *Early Childhood Research Quarterly*, 28(2), 314–324. doi: 10.1016/j.ecresq.2012.07.008
- McCoy, D. C. (2019). Measuring young children's executive function and self-regulation in classrooms and other real-world settings. *Clinical Child and Family Psychology Review*, 22, 63–74 <https://doi.org/10.1007/s10567-019-00285-1>

4 See also <https://www.apa.org/education/k12/relationships>

- Rice, M. (2012). Understanding the importance of self-regulation for preschoolers. Available at: <http://www.ttacnews.vcu.edu/2012/02/understanding-the-importance-of-self-regulation-for-preschoolers/>
- Rosanbalm, K.D., & Murray, D.W. (2017). Promoting self-regulation in early childhood: A practice brief. OPRE Brief #2017-79. Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, US. Department of Health and Human Services. Available at: <http://fpg.unc.edu/sites/fpg.unc.edu/files/resources/reports-and-policy-briefs/PromotingSelf-RegulationIntheFirstFiveYears.pdf>

REFERENCES FROM ORIGINAL TOP 20

- Diamond, A., Barnett, W. S., Thomas, J., & Munro, S. (2007, Nov. 30). Preschool program improves cognitive control. *Science*, 318(5855), 1387–1388. doi:10.1126/science.1151148
- Galinsky, E. (2010). *Mind in the making: The seven essential life skills every child needs*. New York, NY: HarperCollins.
- Wolters, C. A. (2011). Regulation of motivation: Contextual and social aspects. *Teachers College Record*, 113(2), 265–283.
- Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. *Theory Into Practice*, 41(2), 64–70.
- Zumbrunn, S., Tadlock, J., & Roberts, E. D. (2011). *Encouraging self-regulated learning in the classroom: A review of the literature*. Retrieved from <http://www.mehritcentre.com/assets/documents/Self%20Regulated%20Learning.pdf>

PRINCIPLE 8 Children’s creativity can be fostered.

EXPLANATION

Creativity – defined as the generation of ideas that are new and useful in a particular situation – is a critical skill for children. Being able to identify problems, generate potential solutions, evaluate the effectiveness of those strategies, and then communicate with others about the value of the solutions are all highly relevant to academic success and quality of life. Creative approaches to caregiving and teaching can inspire enthusiasm and joy in the learning process by increasing children’s engagement in various activities, situations, and learning contexts. The creative process is often misconstrued as being purely spontaneous

or even frivolous, yet extensive research provides evidence that creativity and innovation are the result of nurtured thinking. Notably, creative thought is sometimes seen as disruptive to classroom functioning because it can be viewed as unsettling rules of convention.

Contrary to the conventional wisdom that creativity is a stable trait (you either have it or you don’t), creative thinking can be cultivated in children.

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

A variety of strategies are available for caregivers and teachers to foster creative thinking in children:

- Emphasize the value of diverse perspectives as fuel for creativity. “Wow, what a cool idea! I’ve never thought about how an animal that is a horse with an eagle head could make a great story character!”
- Allow for a wide range of approaches to completing tasks, engaging in activities, and solving problems, realizing that each child might bring a unique approach to every situation.
- Provide children with opportunities to solve problems in groups and to communicate their creative ideas to a wide range of audiences (peers, teachers, family members).
- Avoid the tendency to see children who are being highly creative as disruptive. Instead teachers should channel this enthusiasm into the solving of real-world problems.
- Vary activities by including opportunities for play and the use of prompts such as, imagine if, create, invent, discover, and predict.
- Use methods that focus on questioning, making unusual connections, envisioning novel alternatives to solutions, and exploring different ideas and options.
- Share with children your own creative ideas – including the use of multiple ways to solve problems. This modeling can also involve providing examples of how creative solutions are not necessary in all situations, which may help children to develop an improved sense of confidence in their judgment as to when it is appropriate to focus on getting one right answer, and when it is appropriate to pursue alternative approaches.

EARLY CHILDHOOD REFERENCES

- Kwaśniewska, J. M., Gralewskib, J., Witkowska, E. M., Kostrzewska, M., & Lebuda, I. (2018). Mothers' personality traits and the climate for creativity they build with their children. *Thinking Skills and Creativity*, 27, 13–24. <https://doi.org/10.1016/j.tsc.2017.11.002>
- Russ, S. W. (2014). Pretend play in childhood: Foundation of adult creativity. Washington, DC: American Psychological Association.
- Saracho, O. (2002) Young children's creativity and pretend play, *Early Child Development and Care*, 172, 431-438, DOI: 10.1080/03004430214553

REFERENCES FROM ORIGINAL TOP 20

- Beghetto, R. A. (2013). *Killing ideas softly? The promise and perils of creativity in the classroom*. Charlotte, NC: Information Age Press
- Kaufman, J. C., & Beghetto, R. A. (2013). In praise of Clark Kent: Creative metacognition and the importance of teaching kids when (not) to be creative. *Roeper Review: A Journal on Gifted Education*, 35, 155 – 165.
- Plucker, J., Beghetto, R. A., & Dow, G. (2004). Why isn't creativity more important to educational psychologists? Potential, pitfalls, and future directions in creativity research. *Educational Psychologist*, 39, 83-96.
- Runco, M. A., & Pritzker, S. R. (Eds.). (2011). *Encyclopedia of creativity* (2nd Edition). Boston: Academic Press.
- Sternberg, R. J., Grigorenko, E. L., & Singer, J. L. (Eds.). (2004). *Creativity: From potential to realization*. Washington, DC: American Psychological Association.

What Motivates Children?

PRINCIPLE 9 Children tend to enjoy learning and to do better when they are more intrinsically rather than extrinsically motivated to achieve.

EXPLANATION

Intrinsic motivation refers to engaging in an activity for its own sake. To be intrinsically motivated means to feel both competent and autonomous (e.g., I can do it for myself). Children who are intrinsically motivated work on tasks because they find them enjoyable. In other words, participation is its own incentive and is not contingent on tangible rewards such as praise, grades, or other external factors. In contrast, children who are extrinsically motivated engage in learning tasks as a means to an end, such as to get a good grade, praise from their parents/caregivers, or to avoid punishment. It is not the case that intrinsic and extrinsic motivation are at opposite ends of a motivation continuum, such that having more of one means having less of the other. Instead, children engage in tasks for both intrinsic and extrinsic reasons (e.g. because they enjoy it and to get a good grade). Nonetheless, intrinsically motivated task engagement is not only more gratifying, it is positively related to more enduring learning, achievement, and perceived competence, and is negatively related to anxiety. These benefits occur because children who are intrinsically motivated are more likely to approach their tasks in ways that enhance learning, such as attending more closely to instruction, organizing new information effectively, and relating it to what they already know. They also feel more self-efficacious and are not burdened by achievement anxiety. On the other hand, children who are more extrinsically motivated may be so focused on the reward (e.g., getting a star by their name) that learning is superficial (e.g., the child may resort to shortcuts such as only doing an easy task instead of a harder one), or they may become discouraged if the pressures are too high. Furthermore, extrinsically motivated children may tend to disengage once the external rewards are no longer provided, whereas

intrinsically motivated children show more long-lived mastery of learning goals.⁵

Notably, however, a substantial body of experimental research studies shows that extrinsic motivation, when properly used, is very important in producing positive educational outcomes. Research also shows that children develop academic competence when they do tasks repeatedly in carefully constructed ways so that the basic skills become automatic (see Principle 5). As basic skills become automatic, the tasks require less effort and are more enjoyable. Just as in sports, children improve their academic skills when they do these activities repeatedly with teacher guidance and feedback, gradually progressing from less complex tasks to more difficult ones. Encouraging children to engage in these activities often requires teacher encouragement and praise for making progress (an extrinsic motivator). **As children develop increasing competence, more complex tasks become more pleasurable. When children have reached this point, learning often becomes its own intrinsic reward.**

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Promoting intrinsic motivation requires the incorporation of practices and activities that support children's fundamental need to feel competent and autonomous:

- When possible, avoid using external rewards (e.g., stickers and prizes) to indicate a job well done or to motivate behavior. Instead provide positive verbal feedback (e.g., saying "Nice job cleaning the paint brushes and paint!") and stress the inherent interest or value in the activity (e.g., telling children that learning about weather can help them prepare for the day). This will keep motivation to pursue further tasks more intrinsic than extrinsic.
- When introducing tasks and activities, use language and techniques that help foster a sense of autonomy for

5 See also: <http://www.apa.org/education/k12/learners.aspx>

participating. To do this, you can: (a) provide choices where possible. These can be small things such as which activity to do first or larger things such as choosing from an array of activities, and (b) avoid controlling language such as “you have to,” “you should,” etc. Instead try third person language for things that need to be done (e.g., everyone will be spending some time in the reading area).

- Introduce tasks that are just above children’s current abilities. Since the motivation to be competent underlies children’s intrinsic motivation, they will persist longer and enjoy activities most when they are optimally challenging.
- Where possible, consider children’s interests when planning activities. Children will be most intrinsically motivated when they have inherent interest in the subject.
- Because intrinsic motivation involves enjoying a task for its own sake, teachers might want to organize learning activities following the ideas presented for Principle 8 on creativity. That is, introduce novelty by providing some level of surprise or incongruity and allowing for creative problem solving.

Supporting children’s intrinsic motivation to learn does not mean that teachers should only introduce activities that are fun for children. Certain tasks in the classroom and in life, like practicing new skills, are going to be inherently uninteresting, at least at the beginning level. It is important to teach children that some tasks, even tasks that are necessary to master, might be uninteresting at first, yet require consistent, sometimes tedious, engagement for learning. Once learned, new skills may become their own reward.

EARLY CHILDHOOD REFERENCES

- Harris, R. (2007). Motivation and school readiness: What is missing from current assessments of preschooler’s readiness for kindergarten? *NHSA Dialog*, 10(3-4), 151-163.
- Ostroff, W., & ASCD. (2012). Understanding How Young Children Learn: Bringing the Science of Child Development to the Classroom. ASCD. Retrieved from <http://proxy.wexler.hunter.cuny.edu/login?url=http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=ED535600&site=ehost-live>
- Patrick, H., Mantzicopoulos, P., Samarapungavan, A., & French, B. (2008). Patterns of young children’s motiva-

tion for science and teacher-child relationships. *Journal of Experimental Education*, 76(2), 121-144.

- Sawyer, J. (2017). I think I can: Preschoolers’ private speech and motivation in playful versus non-playful contexts. *Early Childhood Research Quarterly*, 38, 84-96.

REFERENCES FROM ORIGINAL TOP 20

- Anderman, E.M., & Anderman, L.H. (2014). *Classroom motivation*. Second Edition. Boston, MA: Pearson.
- Brophy, J. (2004). *Motivating students to learn*. Mahwah, NJ: Lawrence Erlbaum Publishers.
- Brophy, J., Wiseman, D.G. & Hunt, G.H. (2008). *Best practice in motivation and management in the classroom* (Second Edition). Springfield, IL: Charles C. Thomas Publisher.
- Deci E.L., & Ryan, R.M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Thorkildsen, T.A., Golant, C.J., & Cambray-Engstrom, E. (2008). Essential solidarities for understanding Latino adolescents’ moral and academic engagement. In C. Hudley & A.E. Gottfried, (Eds.) *Academic motivation and the culture of schooling in childhood and adolescence* (pp. 73-89). Oxford: Oxford University Press.

PRINCIPLE 10 Children persist in the face of challenging tasks and process information more deeply when they adopt mastery goals rather than performance goals.

EXPLANATION

Researchers have identified two broad types of goals: mastery goals and performance goals. **Children who pursue mastery goals are oriented toward acquiring new skills or improving their levels of competence.** In contrast, children who adopt performance goals are motivated to demonstrate their ability through good performance and teacher-approval (see Principle 9). Therefore, they tend to choose tasks that showcase abilities they already have, avoid tasks at which they might fail, and compare themselves to other children. Further, the meanings of “trying hard” and “making mistakes” shift when children hold mastery or performance goals. With mastery goals, children are more persistent because expending effort is consistent with learning and mistakes are interpreted as information about what they have not yet learned. With performance goals, children are more likely to give up because working hard is often seen as a marker of low ability and mistakes as a sign of failure (see Principle 1). In typical classroom situations where children often encounter new or challenging materials, mastery goals are generally more useful than performance goals. Because young children are still developing their understanding of learning and themselves, interactions within the classroom can play a significant role in the goals the children take on in their classrooms.

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

There are specific ways that teachers can interact with and respond to children to foster mastery goals:

- When commenting on or asking open-ended questions about children’s activities (e.g., how did you decide whom to include in your picture?), teachers can focus on effort, problem-solving strategies, progress, and cooperative action, more than on the correctness, neatness, or adequacy of children’s “products.” Over time, children will learn to notice their own progress

and to value the gradual process of building on past knowledge toward mastery.

- Praising children by saying “perfect” or “amazing” or “you’re the best” highlights evaluation and does not provide specific information to the child about what was done well. Instead, provide positive feedback on successful strategies the child seemed to be using (e.g., using different colors really made your flowers stand out!) (see Principle 6, 9, 12).
- Avoid making comparisons between and among children. Focus instead on the progress each child has made on his/her individual work rather than comparing one child’s work to another child’s work.
- Encourage children to see mistakes as opportunities to learn rather than only evidence that they can’t do something. Teachers can even relay to children that “mistakes are our friend” in that they give us an idea about what we need to attend to and focus on next. Teachers’ own attitudes about mistakes can make a big difference to how children develop growth or fixed mindsets about intelligence (Principle 1).

EARLY CHILDHOOD REFERENCES

- Hirsh-Pasek, K., & Golinkoff, R. (2011). The great balancing act: Optimizing core curricula through playful pedagogy. In E. Zigler, W. Gilliam, & W. Barnett (Eds.), *The pre-K debates: Current controversies and issues* (pp. 110-116). Baltimore, MD, US: Paul H Brookes Publishing.
- Hirsh-Pasek, K., Zosh, J., Golinkoff, R., Gray, J., Robb, M., & Kaufman, J. (2015). Putting education in 'educational' apps: Lessons from the science of learning. *Psychological Science In the Public Interest*, 16, 3-34
- Kamins, M., & Dweck, C. (1999). Person versus process praise and criticism: Implications for contingent self-worth and coping. *Developmental Psychology*, 35, 835-847.
- Siegler, R., & Ramani, G. (2009). Playing linear number board games—but not circular ones—improves low-income preschoolers’ numerical understanding. *Journal of Educational Psychology*, 101, 545-560.
- Stipek, D., & Seal, K. (2001). *Motivated minds. Raising children to love learning*. New York: Henry Holt and Company.

REFERENCES FROM ORIGINAL TOP 20

- Ames, C. (1992). Classrooms: Goals, structures, and children motivation. *Journal of Educational Psychology*, 84, 261-271.
- Anderman, L. H., & Anderman, E. M. (2009). Oriented towards mastery: Promoting positive motivational goals for students. In R. Gilman, E. S. Huebner, & M. Furlong (Eds.), *Handbook of positive psychology in the schools* (pp. 161-173). New York, NY: Routledge.
- Deci, E.L., & Ryan, R. M. (2002). The paradox of achievement: The harder you push, the worse it gets. In J. Aronson (Ed.), *Improving academic achievement: Impact of psychological factors in education* (pp. 62-90). San Diego, Ca: Academic press.
- Graham, S. (1990). On communicating low ability in the classroom: Bad things good teachers sometimes do. In S. Graham & V. Folkes (Eds.), *Attribution theory: Applications to achievement, mental health, and interpersonal conflict* (pp. 17-36). Hillsdale, NJ: Erlbaum.
- Meece, J. L., Anderman, E. M., & Anderman L. H. (2006). Classroom goal structure, student motivation, and academic achievement. *Annual Review of Psychology*, 57, 487-503. doi:10.1146/annurev.psych.56.091103.070258

PRINCIPLE 11 Teachers' expectations affect children's opportunities to learn, their motivation, and their learning outcomes.

EXPLANATION

Early childhood educators often hold expectations about the abilities of the children they teach. These beliefs shape the kinds of learning experiences provided to children, the grouping practices that may be used, anticipated developmental and learning outcomes, methods of evaluation, and interpretation of evaluation results. Most teacher expectations about individual ability are based on children's behavior and past performance (sometimes passed on by other teachers). Sometimes this may be an accurate representation; however, especially in the early years, development is highly plastic or changeable, especially within a nurturing and stimulating environment. **When teachers come to hold misperceptions or mistaken beliefs, such as expecting less of a child than he or she can actually achieve, that child may begin to perform in ways**

that confirm the teacher's original expectation. A teacher expectation that creates its own reality has been labeled a *self-fulfilling prophecy*. When mistaken expectations do occur, they are more likely to be directed toward stigmatized groups (e.g., immigrant, ethnic minority, economically disadvantaged children, children with disabilities, and especially young African American boys), because negative beliefs, stereotypes, and implicit biases about the abilities of these groups persist in our society.

These faulty expectations are more likely to occur in the earlier grades, at the beginning of a school year, and in the course of school transitions. In other words, the most vulnerable periods are when the contexts in which information about children's past and potential competence may be least available or reliable and when, because of the messages they receive, children may begin to question their abilities. Whatever the context, expectations influence how teachers treat children. For example, overall teachers appear to provide a more supportive emotional climate, clearer feedback, more attention, more learning time, and more learning opportunities for children for whom they hold high versus low expectations. Over time, teachers' differential treatment can have ripple effects, further widening the achievement gaps that often exist in the early years of school.

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

It is essential for teachers to believe in all children's potential and to communicate high expectations to all children, maintaining elevated, developmentally appropriate standards for everyone in order to avoid negative self-fulfilling prophecies:

- Teachers' expectations should not be based on stereotypes. For example, some boys like to play in the kitchen.
- Teachers can continually assess the reliability of the information they are using to form their expectations. A child's previous difficulties should not be perceived as the absolute last word about that child (e.g., a number of factors may have impaired the child's behavior or performance in the past). Circumstances may change, and a teacher now has an opportunity to disprove previous negative stereotypes by offering positive relationships and challenging, engaging learning experiences to that child (see Principle 13). Again, teachers should remind themselves that race, immigrant status, gender, disability, and social class are not solid

bases on which to form expectations of children's ability and potential.

- It can be helpful for teachers to do a self-check. One way to do that might be for a teacher to ask whether s/he has low-expectations for a child who exhibits negative behavior, or if s/he is more likely to hold a group of children who share a common trait in low regard.

Probably the best antidote to negative expectancy effects is to believe that all children can make progress and to never, ever give up on a child. Teachers' positive expectations will have the greatest influence on children who are most vulnerable to low expectations.

EARLY CHILDHOOD REFERENCES

- Baker, C. N., Tichovolsky, M. H., Kupersmidt, J., Voegler-Lee, M., & Arnold, D. H. (2015). Teacher (mis)perceptions of preschoolers' academic skills: Predictors and associations with longitudinal outcomes. *Journal of Educational Psychology*, 107(3), 805-820.
- Gilliam, W., Maupin, A., Reyes, C., Accavitti, M. & Shic, F. (2016). *Do early educators' implicit biases regarding sex and race relate to behavior expectations and recommendations of preschool expulsions and suspensions?* Retrieved from http://ziglercenter.yale.edu/publications/Preschool%20Implicit%20Bias%20Policy%20Brief_final_9_26_276766_5379.pdf.
- Hinnant, J.B., O'Brien, M., & Ghazarian, S.R. (2009). The longitudinal relations of teacher expectations to achievement in the early school years. *Journal of Educational Psychology*, 101 (3), 662-670.
- Schenke, K., Nguyen, T., Watts, T. W., Sarama, J., & Clements, D. H. (2017). Differential effects of the classroom on African American and non-African American's mathematics achievement. *Journal of Educational Psychology*, 109(6), 794-811.

REFERENCES FROM ORIGINAL TOP 20

- Jussim, L., Eccles, J., & Madon, S. (1996). Social perception, social stereotypes, and teacher expectations: Accuracy and the quest for the powerful self-fulfilling prophecy. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 28, pp. 281–388). San Diego, CA Academic Press.
- Jussim, L., & Harber, K. D. (2005). Teacher expectations and self-fulfilling prophecies: Knowns and unknowns, resolved and unresolved controversies. *Personality and*

Social Psychology Review, 9(2), 131–155. doi:10.1207/s15327957pspr0902_3

- Jussim, L., Robustelli, S., & Cain, T. (2009). Teacher expectations and self-fulfilling prophecies. In A. Wigfield & K. Wentzel (Eds.), *Handbook of motivation at school* (pp. 349–380). Mahwah, NJ: Erlbaum.
- Schunk, D. H., Meece, J. L., & Pintrich, P. R. (2014). *Motivation in education: Theory, research, and applications*. Boston, MA: Pearson.
- Stipek, D. J. (2002). *Motivation to learn: Integrating theory and practice* (4th ed.). New York, NY: Allyn & Bacon.

PRINCIPLE 12 Setting goals that are short term (proximal), specific, and moderately challenging enhances motivation more than establishing goals that are long term (distal), general, and overly challenging.

EXPLANATION

Goal setting is the process by which a person establishes a standard of performance (e.g., “I want to learn to tie my shoes”). This process is important for motivation because children who have a goal and adequate self-efficacy are likely to engage in the activities that lead to attainment of that goal. Self-efficacy is also increased as children monitor the progress they are making toward their goals, especially when they are acquiring new skills in the process. However, for preschool-age children, the development of goal setting and progress monitoring is just beginning and needs significant teacher support.

At any age, three properties of goal setting are important for building children's motivation. First, short-term, or proximal goals are more motivating than long-term, or distal goals because it is easier to judge progress toward proximal goals. Developmentally, children tend to be less skilled at thinking concretely about the distant future; this is certainly the case with very young children. “I really want to finish this puzzle before snack time” is more relevant than “Later this year, I will be able to do harder puzzles.” Second, specific goals (e.g., “During free choice time, I will help my friend read a story today”), are preferable to more general goals (e.g., “I will try to do my best”) because they are easier to quantify and monitor. Third, moderately difficult goals

rather than very hard or very easy goals are the most likely to motivate children because moderately difficult goals typically will be perceived as challenging but attainable (see Principle 9). Because research has documented the benefits of proximal, specific, and moderately challenging goals on motivation and achievement outcomes, classrooms should offer many opportunities for children to plan, and make progress toward accomplishing, these kinds of goals.

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Children need to be provided with many opportunities to set short-term, specific, and moderately difficult goals in their classroom environment. Programs such as *High/Scope* and *Tools of the Mind* include processes for children to (a) plan their activities and identify learning goals, (b) engage in those activities; and (c) review or evaluate their work. Such goals may be set by individual children or, often, by groups of children as they work on class projects or other collaborative activities:

- Keeping a record of goal progress that is regularly checked by the teacher and child or group of children is especially desirable. For young children, visual records are meaningful. For example, if the child's learning plan is to spend time in each of the kindergarten's learning centers before lunch, a pictorial schedule allows the child to see and check off his or her successful completion.
- With support, young children will be able to set moderately challenging short-term (proximal) goals, and over time they will learn to become "intermediate risk takers" (not setting goals that are too low or too high), which is one of the most important characteristics of achievement-oriented individuals.
- Although young children have difficulty thinking about long-term (distal) goals in the abstract, teachers can engage children in longer-term planning through class projects such as a springtime celebration, using a calendar, photos of the upcoming event, and other concrete reminders. "Sub-goals," such as class tasks that lead up to the party (making decorations, cooking, and sending invitations) can be discussed and planned along the way.

EARLY CHILDHOOD REFERENCES

- Diamond, A., Barnett, W. S., Thomas, J., & Munro, S. (2007). Preschool program improves cognitive control. *Science* (New York, NY), 318(5855), 1387. On line: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2174918/>
- Epstein, A.S. (2003). How planning and reflection develop young children's thinking skills. *Young Children*, 58 (5), 28-36.
- Kopp, C. (2014). Young children: Instrumental control, emotion management, and plans. In Friedman, S.L., & Scholnick, E.K. (Eds.), *The developmental psychology of planning: Why, how, and when do we plan?* (pp. 103-126). New York and London: Psychology Press

REFERENCES FROM ORIGINAL TOP 20

- Anderman, E. M., & Wolters, C. (2006). Goals, values, and affect: Influences on student motivation. In P. A. Alexander & P. Winne (Eds.), *Handbook of educational psychology* (2nd ed., pp. 369-389). Mahwah, NJ: Erlbaum.
- Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, 57, 705-717. doi:10.1037/0003-066X.57.9.705d
- Martin, A. J. (2013). Goal setting and personal best (PB) goals. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 356-358). New York, NY: Routledge.
- Schunk, D. H. (1989). Self-efficacy and achievement behaviors. *Educational Psychology Review*, 1, 173-208. doi:10.1007/BF01320134
- Schunk, D. H., & Zimmerman, B. J. (2006). Competence and control beliefs: Distinguishing means and ends. In P. A. Alexander & P. H. Winne (Eds.), *Handbook of educational psychology* (2nd ed., pp. 349-367). Mahwah, NJ: Erlbaum.

Why are social context, interpersonal relationships, and emotional well-being important to children's learning?

PRINCIPLE 13 Learning is situated within multiple social contexts.

EXPLANATION

Given the variation in cultural experiences that children bring with them, it is critical that early childhood educators facilitate a “classroom culture” that ensures shared meanings, values, beliefs, and behavioral expectations and provides a safe and secure environment for all young children.

Children acquire knowledge and skills by relying on families, peers, and structured settings, such as daycare and early childhood education classrooms that are embedded in broader contexts including schools, neighborhoods, communities, and society. As children participate more and more in these broader contexts, they are increasingly influenced by layers of culture, including shared language, beliefs, values, and behavioral norms. Furthermore, these layers interact with each other (i.e., families and early childhood education settings). Appreciating the potential influence of this range of contexts can enhance the effectiveness of instruction and communication across contexts (e.g., between parents and daycare providers or educators)

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Early childhood educators who understand the ways in which the social context of structured educational environments may influence children and the teaching-learning process can facilitate the development of basic skills fundamental to the development of positive interpersonal

relationships and communication between children and their peers and between educators and children because:

- The more teachers know about the cultural backgrounds of children and how differences in values, beliefs, language, and behavioral expectations can influence behavior, the better they can effectively facilitate teaching and learning in structured educational settings. For example, for children whose culture is more collectivist than individualistic, educators can enhance learning experiences through particular emphasis on cooperative learning activities.
- Early childhood educators can relate the curriculum to children's cultural backgrounds. For example, incorporating songs in different languages into language learning or gearing games toward local traditions or family backgrounds. Parents and community members may be an excellent resource for this kind of cultural knowledge.
- Establishing connections with families and local communities can help enhance understanding of children's cultural experiences and facilitate shared understandings about learning. Family involvement also facilitates learning for children and is a crucial part of the transition to school, so creating opportunities for family and community involvement is vital, including inviting parents into the classroom to teach a favorite game, or song, or share cultural experience.
- Seeking opportunities for children to participate in the local community (e.g., attending local cultural events) can help connect the relevance of learning to everyday lives and enhance educators' understanding of the cultural backgrounds and experiences of the young children in the classroom.

EARLY CHILDHOOD REFERENCES

- Dockett, S., & Perry, B. (2017). The role of schools and communities in children's school transitions. *Encyclopedia on Early Childhood Development*.
- Organisation for Economic Co-operation and Development (OECD). Policy lever 1: Setting out quality goals and regulations. Starting strong III: A quality toolbox for early childhood education and care. <http://www.oecd.org/edu/school/startingstrongiii-aqualitytoolboxforearlychildhoodeducationandcare.htm>. Published October 1, 2012. Accessed October 8, 2017.

REFERENCES FROM ORIGINAL TOP 20

- Lee, P. C., & Stewart, D. E. (2013). Does a socio-ecological school model promote resilience in primary schools? *Journal of School Health*, 83, 795–804. doi:10.1111/josh.12096
- National Association of School Psychologists. (2013). *A framework for safe and successful schools*. Retrieved from www.nasponline.org
- Thapa, A., Cohen, J., Higgins-D'Alessandro, & Ga ey, S. (2012). *School climate research summary: August 2012*. New York, NY: National School Climate Center.
- Trickett, E. J., & Rowe, H. L. (2012). Emerging ecological approaches to prevention, health promotion, and public health in the school context: Next steps from a community psychology perspective. *Journal of Educational and Psychological Consultation*, 22, 125–140. doi:10.1080/10474412.2011.649651
- Ysseldyke, J., Lekwa, A. J., Klingbeil, D. A., & Cormier, D. C. (2012). Assessment of ecological factors as an integral part of academic and mental health consultation. *Journal of Educational and Psychological Consultation*, 22, 21–43. doi:10.1080/10474412.2011.649641

PRINCIPLE 14 Interpersonal relationships and communication are critical to both the teaching–learning process and the social development of children.

EXPLANATION

The teaching–learning process in early childhood learning environments is inherently interpersonal, encompassing both educator-child and peer connections. These relationships are essential for facilitating healthy social-emotional development. **Given their social nature, structured learning environments provide a critical context for teaching social skills, such as emotion identification and regulation, communication/ self-expression, and respect.** Developing successful relationships with peers and adults depends highly on one's ability to communicate verbally and nonverbally.⁶

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Given the interpersonal nature of teaching and learning, early childhood educators should attend to the relational aspects of the classroom:

- A safe and secure environment, both physical and social, and shared learning culture (e.g., ensuring that everyone in the classroom is clear about relevant vocabulary, values, and norms) provide the foundation for healthy educator-child and peer relationships.
- Early childhood educators can provide behavioral expectations related to social interactions (e.g., respect for others, use of clear communication, non-violent conflict resolution) and opportunities for all children to experience successful social exchanges and feel safe.
- Learning effective social skills must include planned instruction and opportunities for practice and feedback. These social skills include emotion identification, emotion control/regulation, problem solving, cooperation, and understanding shared goals.
- Early childhood educators are responsible for ensuring that a positive social climate is maintained through cooperative and supportive norms and promoting peaceful resolution of peer conflicts. Intervention should occur where young children demonstrate aggressive behavior toward others. Educators may need assistance from support personnel in developing positive strategies when children persistently use challenging behavior. Educators should avoid expelling or suspending young children from school as non-behavioral factors, such as class size or lack of support staff, lead to or at the very least contribute to a child's challenging behavior.

6 See also <https://www.apa.org/education/k12/relationships>

- One of the foundational skills for the more complex interactions described above is the development of thoughtful communication. Effective communication requires both teaching and practice of component skills. Educators may incorporate lessons in communication basics as part of the routine curriculum. For example, they might incorporate special skills into a lesson (such as using specific words for feelings rather than “good” or “bad”) and provide opportunities to apply those skills, such as during cooperative learning. In addition, early childhood educators can:
 - Prompt children to elaborate on their responses.
 - Engage in give-and-take with other children during discussions.
 - Listen carefully to others.
 - Read nonverbal cues.
 - Provide opportunities for children to practice communication in both structured and social contexts.
 - Provide feedback to enhance skill development.
 - Model effective verbal and nonverbal communication by using active listening, matching facial expression with verbal messages, using questions effectively, providing elaboration in response to children’s questions, and seeking children’s perspectives.

EARLY CHILDHOOD REFERENCES

- Pianta, R., Howes, C., Burchinal, M., Bryant, D., Clifford, R., Early, D., & Barbarin, O. (2005) Features of pre-kindergarten programs, classrooms, and teachers: Do they predict observed classroom quality and child-teacher interactions? *Applied Developmental Science*, 9, 144-159, DOI: 10.1207/s1532480xads0903_2
- Yoshikawa, H., Weiland, C., Brooks-Gunn, J., Burchinal, M., Espinosa, L., Gormley, W. T., Ludwig, J., Magnuson, K., Phillips, D., & Zaslow, M (2013). *Investing in our future: The evidence base on preschool*. Washington, DC: Society for Research in Child Development.

REFERENCES FROM ORIGINAL TOP 20

- Centers for Disease Control and Prevention. (2009). School connectedness: *Strategies for increasing protective factors among youth*. Retrieved from www.cdc.gov/HealthyYouth

- Durlak, J., Weissberg, R., Dymnicki, A., Taylor, R., & Schellinger, K. (2011). The impact of enhancing children’s social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, 82(1), 405–432. doi:10.1111/j.1467- 8624.2010.01564.x
- Pianta, R. C., & Stuhlman, M. W. (2004). Teacher–child relationships and children’s success in the first years of school. *School Psychology Review*, 33(3), 444–458.
- Rimm-Kaufman, S. E., Baroody, A. E., Larsen, A. A., Curby, T. W., & Abry, T. (2015). To what extent do teacher–children interaction quality and children gender contribute to fifth graders’ engagement in mathematics learning? *Journal of Educational Psychology*, 107, 170–185. doi:10.1037/a0037252
- Webster-Stratton, C., Reinke, W. M., Herman, K. C., & Newcomer, L. L. (2013). The Incredible Years teacher classroom management training: The methods and principles that support training delivery. *School Psychology Review*, 40(4), 509–529

PRINCIPLE 15 Emotional well-being influences educational performance, learning, and development.

EXPLANATION

Children’s emotional well-being can influence the quality of their participation in the teaching–learning process, their interpersonal relationships, the effectiveness of their communication, their responsiveness to the classroom learning environment, and the way they interact with the atmosphere established there. Components of emotional well-being in early childhood include beliefs and perceptions of oneself, confidence in one’s abilities to meet classroom expectations, a sense of control over oneself and one’s environment, self-regulation of emotions and behaviors, general feelings of well-being, and capacity for responding in healthy ways to everyday stresses. Being emotionally healthy depends on understanding, expressing, and regulating one’s own emotions, as well as perceiving and understanding others’ emotions. Finally, understanding others’ emotions is influenced by how children perceive expectations from their early childhood educators and peers, and acceptance on the part of significant others in their classroom, family, peer group, community, and cultural environment. (see Principles 13 and 14).

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Early childhood educators play a key role in helping children learn about emotions; establishing an environment in which all children are accepted, valued, and respected; providing extra support for individual children when needed; and fostering positive relationships. Early childhood educators can help facilitate the way children experience, express, and regulate their emotions by:

- Helping children build their emotional vocabulary by having a chart with facial expressions and asking children to identify how a child in an illustration might be feeling at a certain moment, or asking children what makes them feel sad, happy, angry, etc.
- Responding in ways that validate children's emotions. This is as simple as providing a label for an emotion (e.g., "I see you're angry."). Behavior does not need to be validated (e.g., "Even though you're angry, you are not allowed to hit.").
- Helping children regulate their emotions. For example, a teacher can help a child who is having a meltdown breathe deeply while modelling this behavior for them.
- Establishing routines for helping to regulate emotions. Creating a "cozy corner" in the room where children can take time alone when feeling upset.
- Encouraging and teaching appropriate language to use when they feel upset. For example, helping children express the need for some space/time alone.
- Teaching children to be empathic and compassionate; modeling this for them daily and encouraging them to engage in kind behaviors, such as by asking a friend who is upset how they are feeling or if they are okay, not only saying sorry for something they have done but also asking what they can do to make it better. Teachers can also create a space where children in conflict or who are about to have a conflict can achieve a sense of equilibrium. Creating this balance should be scaffolded by the teacher.
- Encouraging children to resolve their conflicts and forgive each other, while engaging in a conversation about what they could do differently in the future, creating some space if children feel they need it, and then helping them to rejoin their friends when they feel ready.

EARLY CHILDHOOD REFERENCES

- Bagdi, A., & Vacca, J. (2005). Supporting Early Childhood Social-Emotional Well Being: The Building Blocks for Early Learning and School Success. *Early Childhood Education Journal*, 33(3), 145-150. doi:10.1007/s10643-005-0038-y
- Denham, S. A., Blair, K. A., DeMulder, E., Levitas, J., Sawyer, K., Auerbach-Major, S., & Queenan, P. (2003). Preschool Emotional Competence: Pathway to Social Competence? *Child Development*, 74, 238-256.
- Graves Jr., S. L., & Howes, C. (2011). Ethnic Differences in Social-Emotional Development in Preschool: The Impact of Teacher Child Relationships and Classroom Quality. *School Psychology Quarterly*, 26(3), 202-214. doi:10.1037/a0024117
- Zinsser, K. M., Denham, S. A., & Curby, T. W. (2018). Being a social-emotional teacher: The heart of good guidance. *Young Children*, 73(4), 77-83

REFERENCES FROM ORIGINAL TOP 20

- CASEL (Collaborative for Academic, Social, and Emotional Learning). (2012). *CASEL Guide: Effective social and emotional learning programs*. Retrieved from www.casel.org
- Hagelskamp, C., Brackett, M. A., Rivers, S. E., & Salovey, P. (2013). Improving classroom quality with the RULER approach to social and emotional learning: Proximal and distal outcomes. *American Journal of Community Psychology*, 51(3-4), 530-543. doi:10.1007/s10464-013-9570-x
- Jain, S., Buka, S. L., Subramanian, S. V., & Molnar, B. E. (2012). Protective factors for youth exposed to violence: Role of developmental assets in building emotional resilience. *Youth Violence and Juvenile Justice*, 10, 107-129. doi:10.1177/1541204011424735
- Jones, S. M., Aber, J. L., & Brown, J. L. (2011). Two-year impacts of a universal school-based social-emotional and literacy intervention: An experiment in translational developmental research. *Child Development*, 82(2), 533-554. doi:10.1111/j.1467- 8624.2010.01560.x
- Seligman, M. E. P., Ernst, R. M., Gillham, J., Reivich, K., & Linkins, M. (2009). Positive education: Positive psychology and classroom interventions. *Oxford Review of Education*, 35, 293-311. doi:10.1080/03054980902934563

How can the classroom best be managed?

PRINCIPLE 16 Expectations for classroom conduct and social interaction are learned and can be taught using proven principles of behavior and effective classroom instruction.

EXPLANATION

Children's ability to learn is as much affected by their emotional and behavioral self-regulation as it is by their cognitive skill. Children's behavior that does not conform to classroom rules or teacher expectations cannot simply be regarded as a distraction to be eliminated before instruction can take place. **Rather, behaviors conducive to learning and appropriate social interaction are best taught at the beginning of the academic year and continuously reinforced throughout the year.** These behaviors can be taught using proven behavioral principles, including modeling and play-based activities. For children exhibiting more serious or consistent problem behaviors, understanding the context and function of the behavior is a key element in teaching appropriate replacement behaviors.⁷

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Early childhood education programs offer ideal opportunities for young children to develop the cognitive, social, emotional, and behavioral skills to be "ready to learn" in later classroom settings. A goal of early childhood education should be to develop these skills to prepare young children for K-12 education.

- Skills needed for effective classroom participation, including getting along with others, paying attention, following directions, and managing emotions can be taught through direct instruction embedded in daily activities, offering repeated opportunities to practice these skills. Incorporating cognitive, social, emotional, and behavioral skill-building opportunities into classroom play creates natural opportunities for skill development across multiple contexts. Teacher modeling further enhances children's acquisition of these skills.
- Classroom expectations may begin at a basic level to orient children to the classroom setting and the structure of the school day. Behavioral expectations should increase in complexity over time as children become better able to comply.
- Families should be included in activities and processes aimed at developing children's cognitive, social, emotional, and behavioral skills. Sharing expectations, curriculum, and activities through newsletters, home-based actions, family events, and other methods can encourage families to focus on these skills, offering additional learning contexts and aligning home and school expectations.

EARLY CHILDHOOD REFERENCES

- Blair, C., & Raver, C.C. (2015). School readiness and self-regulation: A developmental and psychobiological approach. *Annual Review of Psychology*, 66, pp. 711-731.
- Mashburn, A. J., & Pianta, R. C. (2006). Social relationships and school readiness. *Early Education and Development*, 17(1): 151-176.
- McClelland, M. M., Tominey, S. L., Schmitt, S. A. & Duncan, R. (2017). SEL interventions in early childhood. *The Future of Children*, 27(1), pp. 33 – 47.
- Milagros, N., & Barnett, W. S. (2014). *Access to high quality early care and education: readiness and opportunity gaps*

⁷ See also <https://www.apa.org/education/k12/classroom-management>

in America. New Brunswick, NJ: Center on Enhancing Early Learning Outcomes.

Morris, P., et al. (2013). *Using Classroom Management to Improve Preschoolers' Social and Emotional Skills: Final Impact and Implementation Findings from the Foundations of Learning Demonstration in Newark and Chicago*. New York: MDRC.

REFERENCES FROM ORIGINAL TOP 20

- American Psychological Association, Zero Tolerance Task Force. (2008). Are zero tolerance policies effective in the schools? An evidentiary review and recommendations. *American Psychologist*, 63, 852–862. doi:10.1037/0003-066X.63.9.852
- Evertson, C. M., & Emmer, E. T. (2009). *Classroom management for elementary teachers* (8th ed.). Upper Saddle River, NJ: Pearson.
- Skiba, R., & Peterson, R. (2003). Teaching the social curriculum: School discipline as instruction. *Preventing School Failure*, 47(2), 66–73.
- Slavin, R. E. (Ed.). (2014). *Classroom management and assessment*. Thousand Oaks, CA: Corwin Press.
- Sprick, R. (2006). *Discipline in the secondary classroom: A positive approach to behavior management* (2nd ed.). San Francisco, CA: Jossey-Bass.
- Sugai, G., & Simonsen, B. (2015). Supporting general classroom management: Tier 2/3 practices and systems. In E. T. Emmer & E. J. Sabornie (Eds.), *Handbook of classroom management* (2nd ed., pp. 60–75). New York, NY: Taylor & Francis

PRINCIPLE 17 Effective classroom management is based on (a) setting and communicating high expectations, (b) consistently nurturing positive relationships, and (c) providing a high level of support.

EXPLANATION

To be both effective and culturally responsive, teachers can develop and maintain strong, positive relationships with children by consistently communicating that they value each child (see Principle 11). The development of

an effective learning climate is based on structure and this kind of support. In terms of structure, children need to have a clear understanding of the behavioral rules and expectations of the classroom, and these expectations must be communicated directly and frequently, as well as being consistently enforced. Behavioral expectations should begin with simple tasks and increase in complexity throughout the year so that children are ready for the structured school setting by the end of their pre-K experience (see Principle 16).

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Children profit from a predictable structure, high expectations for cognitive growth and classroom behavior, and consistent modeling, reminders, and support for learning what is expected to meet those expectations.

- A safe and well-arranged physical environment, a predictable schedule, and rules that are clearly explained and consistently reinforced all contribute to a safe and orderly learning climate that reduces distraction and keeps the focus on learning and development of skills.
- A teacher modeling the role of emotion, attention, and learning during daily activities through purposeful interaction with each child helps to create a positive classroom environment and develops a productive pathway for learning.
- Teachers benefit from targeted supports such as continuing education opportunities, mentoring, and collaboration with peers and to help them master positive behavior management techniques and warm, nurturing approaches to working with young children.

EARLY CHILDHOOD REFERENCES

- Bierman, K. L., Domitrovich, C. E., Nix, R. L., Gest, S. D., Welsh, J. A., et al., (2008). Promoting academic and social-emotional school readiness: The Head Start REDI program. *Child Development*, 79(6), pp. 1802-1817.
- Blair, C., & Raver, C.C. (2015). School readiness and self-regulation: A developmental and psychobiological approach. *Annual Review of Psychology*, 66, 711-731.
- Diamond, A., Barnett, W.S., Thomas, J., & Munro, S., (2007). Preschool program improves cognitive control. *Science*, 318(5855), pp. 1387-1388.
- Shure, M. B. (1993). I can problem solve: Interpersonal cognitive problem solving for young children. *Early Child Development and Care*, 96, 49-64.

Zins, J.E. (2004). Building Academic Success on Social and Emotional Learning: *What Does the Research Say?* NY: Teachers College Press.

REFERENCES FROM ORIGINAL TOP 20

- Evertson, C. M., & Emmer, E. T. (2009). Classroom management for elementary teachers (8th ed.). Upper Saddle River, NJ: Pearson.
- Rothstein-Fisch, C., & Trumbull, E. (2008). Managing diverse classrooms: How to build on students' cultural strengths. Alexandria, VA: Association for Supervision and Curriculum Development.
- Skiba, R., & Peterson, R. (2003). Teaching the social curriculum: School discipline as instruction. *Preventing School Failure*, 47(2), 66–73.
- Weinstein, C., Tomlinson-Clarke, S., & Curran, M. (2004). Toward a conception of culturally responsive classroom management. *Journal of Teacher Education*, 55, 25-38. doi:10.1177/0022487103259812

How can educators assess children's progress?

PRINCIPLE 18 Formative and summative assessments are both important and useful but require different approaches and interpretations.

EXPLANATION

Formative assessments, sometimes referred to as authentic assessments, are used to guide and shape classroom instruction directly. Summative assessments are used to produce an overall judgment of children's learning progress or the effectiveness of educational programs. Formative assessments can answer questions such as "How is Mary progressing in understanding the concept of one-to-one correspondence?" and can take place before or during instruction. These assessments can be spontaneous, and have the explicit purpose of improving current learning. Summative assessments, which may take the form of standardized, norm-referenced measures, attempt to gauge children's learning at a particular moment, usually at the end of a unit of study, a period of time, or academic year.

The approach used to collect information on young children is likely to differ between the two types of assessments as well, given their different purposes. The effectiveness of formative assessments can inform instructional practice. It is more likely to depend on the teacher's knowledge of child development for accurate and reliable observation and documentation of learning and well-being. Strategies may incorporate learning progressions and include discussion, collaboration, self and peer assessment, and descriptive feedback. Summative assessments, given their purpose of evaluating progress against a benchmark, are more likely to be standardized large-scale assessments that evaluate individual work to yield an overall score or performance-level designation.

Both formative and summative assessments can be developed by teachers or those outside of the classroom—for example, by a testing company on behalf of a state agency or a curriculum developer. Although these two types of assessments are designed to address different questions, they should complement each other in an effort to produce valid, fair, useful, and reliable sources of information and insight into young children's learning and development (see Principle 19).

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Employing formative assessments can result in important increases in children's learning when teachers:

- Have sound knowledge of child development
- Have, over time, developed the skill of observation and documentation of young children's learning and development
- Use lessons and other classroom experiences to collect evidence on children's learning.
- Are able to use this evidence to assess what children know and promptly modify their instructional practices to facilitate individual and group learning, as needed.

Teachers can improve the effectiveness of formative assessments when they:

- Focus systematically on setting appropriate learning goals for individual children, and then determine whether children have met these goals.
- Consistently consider how to improve their instructional practices.
- Keep the length of time between the formative assessment and subsequent instruction relatively short; as this is when the information from the formative assessment is most accurate and relevant.

Teachers can make better use of both formative and summative assessments when they understand basic concepts of educational measurement (also see Principles 19 and 20). Teachers can also use assessment data to evaluate their own instruction to consider whether they have adequately addressed the material they intended to cover and whether they were effective in meeting their instructional goals. Teachers will also want to ensure that they provide multiple formats for instructional delivery (for example through conversation, drawings, or constructions) for children to demonstrate what they have learned and are trying to understand.

EARLY CHILDHOOD REFERENCES

- Gullo, D. F. (2005). *Understanding assessment and evaluation in early childhood education* (2nd ed.). New York: Teachers College Press.
- Jablon, J. R., Dombro, A. L., & Dichtlemiller, M.L. (1999). *The power of observation* (2nd ed). Teaching Strategies, Washington, DC.
- National Association for the Education of Young Children (2003). Early childhood curriculum, assessment and program evaluation: Building effective, accountable systems in programs for children birth through age 8. *Position Statement on Curriculum, Assessment, and Program evaluation*. Washington, DC.

REFERENCES FROM ORIGINAL TOP 20

- Black, P., Harrison, C., Lee, C., Marshall, B., & Wiliam, D. (2003). *Assessment for learning: Putting it into practice*. Buckingham, England: Open University Press.
- Council of Chief State School Officers (CCSSO). (2008). *Formative assessment: Examples of practice*. Retrieved from the CCSSO website: http://ccsso.org/Documents/2008/Formative_Assessment_Examples_2008.pdf
- Heritage, M. (2007). Formative assessment: What do teachers need to know and do? *Phi Delta Kappan*, 89(2), 140–145.
- Sheppard, L. A. (2006). Classroom assessment. In R. L. Brennan (Eds.), *Educational measurement* (4th ed., pp. 623–646). West port, CT: American Council on Education/Praeger.
- Wylie, C., & Lyon, C. (2012, June). Formative assessment—Supporting children’s learning. *R & D Connections* (No. 19). Retrieved from the Educational Testing Service website: http://www.ets.org/Media/Research/pdf/RD_Connections_19.pdf

PRINCIPLE 19 Children’s skills, knowledge, and abilities are best measured with assessment processes grounded in psychological science with well-defined standards for quality and fairness.

EXPLANATION

Teachers and leaders are working in an era when assessments are a constant topic of discussion and debate. It is important to remember, however, that there are clear standards for judging the quality of assessments of any type. This is true of both formative and summative assessment (see the Standards for Educational and Psychological Testing; AERA, APA, & NCME, 2014). **Assessments that are both reliable and valid help teachers, administrators, and policymakers make appropriate inferences about children’s knowledge, skills, and abilities.**

The validity of an assessment can be thought of in relation to four essential questions:

- How much of what you want to measure is actually being measured?
- How much of what you did not intend to measure is actually being measured?
- What are the intended and unintended consequences of the assessment and its results?
- What evidence do you have to support your answers to the first three questions?

The **validity** of an assessment tool is not simply a number. It is a judgment, over time and across a variety of situations, about the inferences that can be drawn from assessment data, including the intended or unintended consequences of using the assessment. For example, assessment users need to be able to infer from assessment results that it accurately reflects children’s learning and not other factors. For this to be true, the assessment must be validated for the purpose and population for which it is being used. Further, individual children must be motivated and engaged in activities that will enhance their eagerness to show what they know and can do. Otherwise, center and school personnel cannot tell if children’s learning is being measured or if what is being measured is the degree of effort the child is putting into participating in an assessment process.

Fairness is a component of validity. Valid assessment requires saying clearly what an assessment is and is not supposed to measure and requires evidence of this for all test takers. Assessments showing real differences among young children that are based on what is being measured are fair; tests showing differences among children that are unrelated to the purpose of the test are not fair. For example, asking a young child from an urban environment when deer hunting season takes place, could be considered to be an unfair assessment of the child's vocabulary given deer hunting is not common in urban environments.

Reliability of an assessment is also a key factor. A reliable assessment is one whose results are consistent indicators of children's knowledge, skills, and abilities. Scores should not be affected by chance factors associated with, for example, children's motivation or interest as it relates to a given set of test questions, variations in testing conditions, or other variables that are not part of what the assessment administrator intends to measure. In general, assessments with more items are more reliable than shorter ones. However, the limited attention span of young children should be a critical consideration when deciding on how many items to include.

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

Whenever teachers administer an assessment, it is best to consider its strengths and limitations with respect to what they hope it will tell them about their children's learning. Teachers can apply strategies to improve the reliability of their assessments and be cognizant of why some assessments will be more reliable than others. Teachers can improve the quality of the assessments they use by:

- Only assessing material that has been taught or discussed.
- Using a sufficient number of questions and a variety of assessment formats in which children may demonstrate their knowledge and skill on the same topic.
- Avoid questions that are too hard or too easy and are not providing sufficient differentiation in knowledge (e.g., 100% of children answered the item correctly).
- Being mindful that assessments that are valid for one use or setting may not be valid for another (e.g., an assessment designed as a screening tool may not be valid for monitoring progress over time).

- Basing high-stakes decisions on multiple measures instead of a single test result.
- Monitoring children's outcomes to determine whether there are consistent discrepancies across performance or outcomes of children from different cultural groups. For example, are some subgroups of children routinely overrepresented in certain types of programming (e.g., special education)?

REFERENCES FOR EARLY CHILDHOOD

- Berry, D. J., Bridges, L. J., & Zaslow, M. J. (2004). *Early childhood measures profiles*. Washington, DC: Child Trends.
- Halle, T., Zaslow, M., Wessel, J., Moodie, S., & Darling-Churchill, K. (2011). *Understanding and choosing assessments and developmental screeners for young children: Profiles of selected measures*. Washington, DC: Office of Planning, Research, and Evaluation, Administration for Children and Families, US Department of Health and Human Services.
- National Research Council (2008) *Early childhood assessment: Why, what, and how/* Washington, DC.: The National Academies Press. <https://doi.org/10.17226/12446>.

REFERENCES FROM ORIGINAL TOP 20

- American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing*. Washington, DC: American Educational Research Association.
- Brookhart, S. (2011). Educational assessment knowledge and skills for teachers. *Educational Measurement: Issues and Practice*, 30(1), 3–12.
- Moss, P. A. (2003). Reconceptualizing validity for classroom assessment. *Educational Measurement: Issues and Practice*, 22(4), 13–25.
- Smith, J. K. (2003). Reconsidering reliability in classroom assessment and grading. *Educational Measurement: Issues and Practice*, 22(4), 26–33.
- William, D. (2014). What do teachers need to know about the new Standards for educational and psychological testing? *Educational Measurement: Issues and Practice*, 33, 20–30. doi:10.1111 /emip.12051

PRINCIPLE 20 Making sense of assessment data depends on clear, appropriate, and fair interpretation.

EXPLANATION

The meaning of assessment outcomes depends on clear, appropriate, and fair interpretation. Scores from any assessment should generally be used only for the specific purposes for which the assessments were designed.

Effective teaching depends on teachers being informed consumers of educational research, effective interpreters of data for classroom use, and good communicators with children and their families about assessment data and resulting decisions that affect children. Teachers can weigh curricular and assessment choices to evaluate whether those resources are supported by research evidence and are suitable for use with diverse learners.

For example, tests intended to rank order children for a competition may be valid, fair, and useful for that purpose, but at the same time these tests would likely be misleading for determining the strengths and weaknesses of each individual children's mastery of material in a particular subject-matter area.

RELEVANCE FOR EARLY CHILDHOOD EDUCATORS

To interpret assessment data effectively, teachers should address the following about any assessment they use:

- What was the assessment intended to measure?
- How are the assessment results to be used? Are the results aligned to the goals for which the assessment was designed?
- What comparisons are the assessment data based on? Are children being compared to one another? Or, instead, are children's responses being directly compared to samples of acceptable and unacceptable responses that the teacher or others have provided?
- What are the criteria for cut-points or standards? Are the children's scores being classified using a standard or cut-point, such as a pass/fail category, letter grades, or some other indicator of satisfactory/unsatisfactory performance?

Data gathered from any assessment are best interpreted in light of their suitability for addressing specific questions about children or educational programs, their appropriateness for individuals from a variety of different backgrounds and educational circumstances, and the intended and unintended consequences that result from using the assessment. Because both higher- and lower-stakes assessments can have significant impact on children, it is important to make careful interpretations of the results of either type of test.

Awareness of the strengths and limitations of any assessment is critical. Such awareness also enables teachers to communicate caveats, such as the sub-optimal reliability of scores (see more on this in Principle 19) and the importance of using multiple sources of evidence for high-stakes decisions.

REFERENCES FOR EARLY CHILDHOOD

National Research Council (2008) *Early childhood assessment: Why, what, and how*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/12446>.

REFERENCES FROM ORIGINAL TOP 20

American Educational Research Association, American Psychological Association, & National Council on Measurement in Education. (2014). *Standards for educational and psychological testing*. Washington, DC: American Educational Research Association.

American Psychological Association. (n.d.). *Appropriate use of high-stakes testing in our nation's schools*. Retrieved from <http://apa.org/pubs/info/brochures/testing.aspx>



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