

Second Edition

Tools *of* the Mind

The Vygotskian Approach to Early Childhood Education

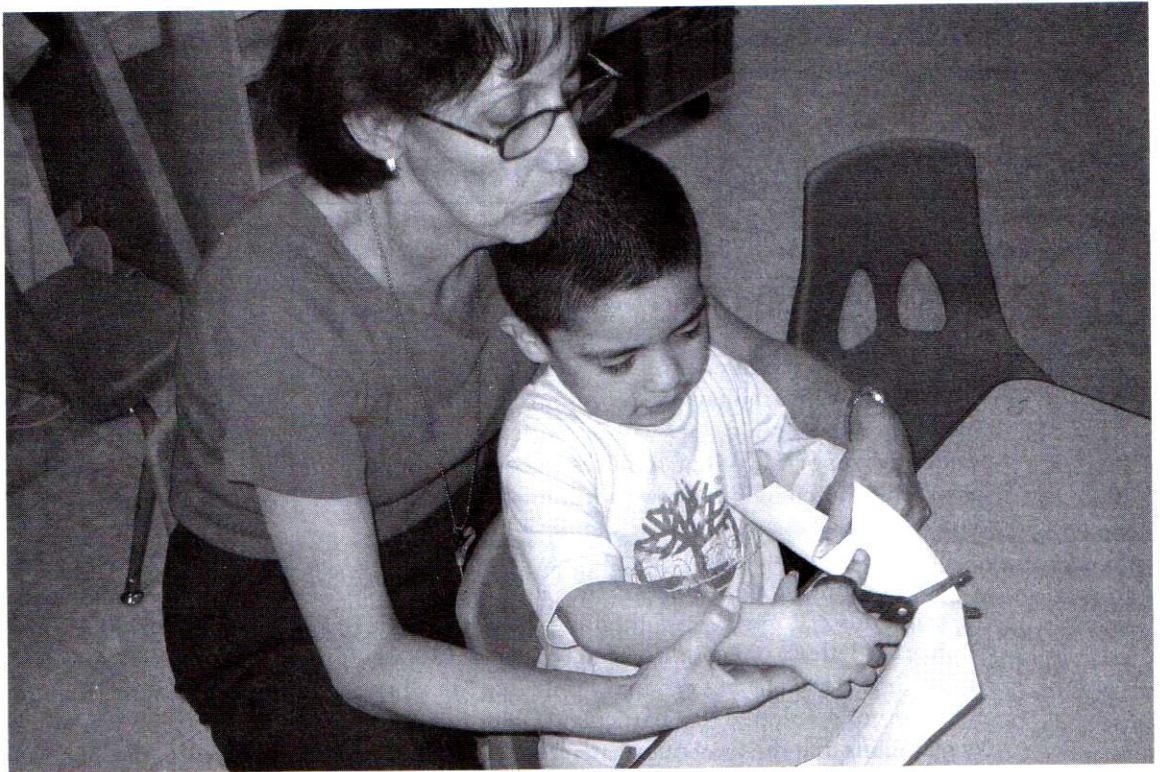


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Foreword by Michael Cole

CHAPTER 4

The Zone of Proximal Development





Both the acquisition of a specific cultural tool and further mental development depend on whether or not that tool lies within the child's ZPD. Vygotsky considered the ZPD a strategy for development and learning.

Defining the Zone of Proximal Development

The *Zone of Proximal Development*, or *ZPD*, one of the most well known of all of Vygotsky's concepts, is a way of conceptualizing the relationship between learning and development. Vygotsky chose the word *zone* because he conceived development not as a point on a scale, but as a continuum of behaviors or degrees of maturation. Vygotsky writes about this zone as a "distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (Vygotsky, 1978, p. 86).

By describing the zone as proximal (next to, close to), he meant that the zone is limited by those behaviors that will develop in the *near* future. *Proximal* refers not to all possible behaviors that will eventually emerge, but to those closest to emergence at any given time: "What the child is able to do in collaboration today he will be able to do independently tomorrow" (Vygotsky, 1987, p. 211).

Independent Performance and Assisted Performance

For Vygotsky, development of a behavior occurs on two levels that form the boundaries of the ZPD. The lower level is the child's *independent performance*—what the child knows and can do alone. The higher level is the maximum the child can reach with help and is called *assisted performance*. Between maximally assisted performance and independent performance lie varying degrees of partially assisted performances (see Figure 4.1).

The skills and behaviors represented in the ZPD are dynamic and constantly changing. What a child does with some assistance today is what the child will do independently tomorrow. What requires maximum support and assistance today will be something the child can do with minimal help tomorrow. Thus, the assisted performance level will change as the child develops.

In education and psychology, we have traditionally focused on what is developed or achieved by independent performance only. For example, we say that if 5-year-old Susan correctly adds $2 + 2$ by herself, then she can add. Similarly, we say that Frank has learned to make the letter *n* only when he can write it on his own. If there is a prompt by an adult, for instance, if the teacher reminds Frank that "an *n* has one hump," then we say that the child has not developed this particular skill or doesn't know the information yet. Vygotsky maintains that the level of independent performance is an important index of development, but he argues that it is not sufficient to completely describe development.

The level of assisted performance includes behaviors performed with the help of, or in interaction with, another person, either an adult or a peer. This interaction may involve giving hints and clues, rephrasing questions, asking the child to restate what has been said, asking the child what he understands, demonstrating the task or a portion

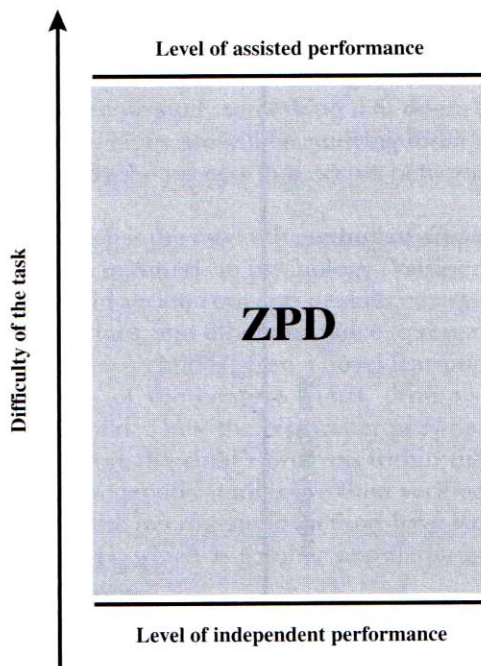


Figure 4.1 The zone of proximal development

of it, and so on. The interaction can also take the form of indirect help, such as setting up the environment to facilitate practicing a specific set of skills. For example, a teacher might provide labeled sorting trays to encourage classification. Assisted performance also includes interaction and talking to others who are present or imaginary, such as explaining something to a peer. Therefore, a child's level of assisted performance includes any situation in which there are improvements in the child's mental activities as a result of social interaction. The specific kinds of social interactions that result in advances in mental development are described in Chapters 5, 6, and 7.

Dynamics of the ZPD

The ZPD is not static but shifts as the child attains a higher level of thinking and knowledge (see Figure 4.2). Thus, development involves a sequence of constantly changing zones. With each shift, the child becomes capable of learning more and more complex concepts and skills. What the child did only with assistance yesterday becomes the level of independent performance today. Then, as the child tackles more difficult tasks, a new level of assisted performance emerges. This cycle is repeated over and over again, as the child climbs his way to complete acquisition of a body of knowledge, skill, strategy, discipline, or behavior.

The ZPD is different for different children. Some children require all possible assistance to make even small gains in the learning. Other children make huge leaps with much less assistance.

At the same time, the size of the ZPD for one child may vary from one area to another, or at different times in the learning process. A highly verbal child may not have trouble

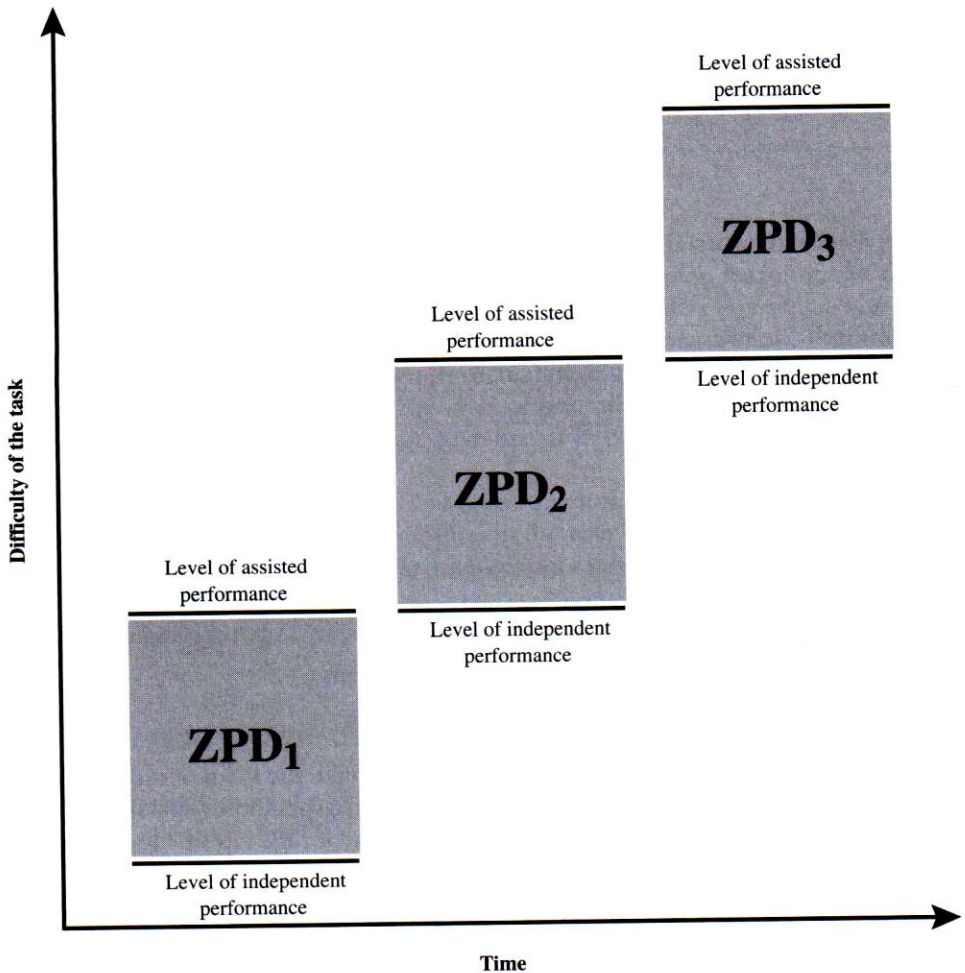


Figure 4.2 The dynamic nature of the ZPD

acquiring concepts in reading comprehension, for example, but have great difficulty with long division. Vygotskians would say that the child needs more assistance in one area than another. In addition, at various times in the process of learning, children respond to different types of assistance. If Mary has been counting for only a few weeks, she may need more assistance that is closer to her level of independent performance than she will 3 months later, after she has been counting for several months. At that time, the ZPD will be larger and the number of activities that she can do with assistance will be greater.

Using the ZPD to Study Development

Vygotsky's approach focuses on the child "to be" or "the future child," rather than on the "present child" or what she is like at this moment. As Leont'ev stated after Vygotsky's death, "American researchers are constantly seeking to discover how the child came to

be what he is; we in the USSR are striving to discover not how the child came to be what he is, but how he can become what he not yet is" (Bronfenbrenner, p. 528, 1977). Because of this focus, the emphasis in the Vygotskian paradigm is on the higher level of the ZPD or what the child will be in time. But how can we study something that doesn't yet exist? If we wait until a certain concept or skill emerges, we will be studying today's child, not tomorrow's! What we need is a way to study the process that occurs between the current state and tomorrow's state.

One of the innovations of the Vygotskian approach is the research method of *double stimulation*, or *microgenetic method*, as it is better known in American psychology (Valsiner, 1989). In this method, the researcher studies the child as new concepts or skills emerge (Vygotsky, 1999). The researcher designs the hints, clues, and other assistance to reveal not just what the child learns but *how* the child learns. A child is given a novel learning task, and the researcher monitors which elements of the context (hints, prompts, materials, clues, and interactions) are used by the child. Thus, the researcher provides assistance at the higher level of the ZPD and monitors the child's progress within the ZPD (Gal'perin, 1969). The results from these microgenetic studies are then verified using standard traditional methods. Adaptations of the microgenetic method have led to the idea of dynamic assessment (See Chapter 14), which is gaining popularity in psychological laboratories as well as in the classrooms.

Vygotsky insisted that the entire ZPD be used to determine the child's developmental level because it reveals (a) skills on the edge of emergence, and (b) the limits of the child's development at this specific time.

The child's behavior in assisted performance reveals the behaviors that are on the verge of emergence. However, if we use only independent performance to find out where a child is—what she knows and what she can do—then the skills that are on the edge of emergence will not be apparent. Two children whose independent performance is on the same level may have very different developmental characteristics because their ZPDs differ. For example, neither Teresa nor Linda can walk across a balance beam. Both of them stand on the end and stare down the beam. The teacher holds out his hand to assist each girl's performance. Although each is given the same teacher support, Teresa can only stand on the balance beam holding the teacher's hand tightly, but Linda walks across the beam easily. Independent performance alone is misleading in this example. When we see how the two girls respond to assistance, we can tell that they are at very different levels.

The ZPD is not limitless; a child cannot always be taught any given thing at any given time. Assisted performance is the *maximum* level at which a child can perform today. Children cannot be taught skills or behaviors that exceed their ZPD. In the previous example, no matter what support the teacher gave that day, Teresa and Linda could not be taught to do a handstand on the beam.

When a skill is outside of the ZPD, children generally ignore, fail to use, or incorrectly use that skill. By observing children's reactions, teachers will know if the assistance provided falls within the ZPD. Teachers must carefully note which prompts, clues, hints, books, activities, or peer cooperative activities have a desired effect on the child's learning. Teachers should not be afraid to try a higher level, but they need to pay attention to the child's reaction to attempts at the higher level of the ZPD. Knowing which prompts and hints don't help gives the teacher just as much information as knowing the ones that do help.

Implications for Learning/Teaching

The term *learning/teaching* is currently used as a translation of the Russian word *obuchenije*. *Obuchenije* describes both a child's learning and the teacher's teaching of knowledge and skills. It includes the contribution of both the learner and the teacher and implies that both are active in this process. In contrast, in Western conceptions of education, learning tends to describe only what the pupil does, and words like *teaching*, *training*, and *educating* describe primarily the teacher's role. Thus, the term *learning/teaching* more accurately represents Vygotsky's meaning than either the words *learning* or *teaching* alone.

The ZPD has three important implications for learning/teaching:

1. How to assist a child in performing a task
2. How to assess children
3. How to determine what is developmentally appropriate

Assisting Performance

It is common to think of the assisted performance level of the ZPD in terms of expert-novice interactions, in which one person has more knowledge than the other. In this type of interaction, most commonly occurring in direct teaching, it is the expert's responsibility to provide support and direct the interaction so that the novice can acquire the necessary behavior. These expert-novice interactions can be informal, as when children interact with parents or siblings (Rogoff, 1990).

Vygotsky's conception of ZPD, however, is much broader than the expert-novice interaction, extending to all socially shared activities. Also, not all of the assistance used by the child is intentionally provided by an adult. Vygotsky believed that the child can start performing on a higher level of a ZPD through any type of social interaction: interaction with peers as equals, with imaginary partners, or with children at other developmental levels (Newman & Holzman, 1993). For example, 3-year-old Benny cannot sit still during a story. The teacher tries to provide different types of assistance to help him focus. She calls out his name, places her hand on his shoulder, and signals to him nonverbally. In spite of these efforts, Benny continues to wiggle and look around the room. Later that day, Benny is playing school with a group of friends. Tony sits in a chair and "reads" the book just like the teacher, while Benny and several other children pretend to be students and listen. Benny sits and listens, focusing his attention for 4 to 5 minutes. Benny is practicing the same behavior that the teacher desired—focused attention. The ability to concentrate for a short time is within his ZPD, but we can see that he requires a particular type of assistance, that of play and peers. With the assistance of his peers, he is able to perform at the higher levels of his ZPD, but with the teacher he is not able to do so. We will discuss in Chapter 10 why play is so useful in helping children to move through a ZPD.

Assessing Children's Abilities

The idea of ZPD has direct implications for assessing what children know and can do. Instead of limiting assessment only to what children can do independently, we should include what they can do with different levels of assistance. Teachers should note how children use their help as well as what hints are the most useful. This technique, often called "dynamic assessment," has great potential for improving and expanding

authentic classroom assessment and is discussed in detail in Chapter 14 (Cronbach, 1990; McAfee & Leong, 2006; Spector, 1992).

By using the ZPD in assessment, not only do we have a more accurate estimate of the child's abilities, but we have a more flexible way of assessing children. Teachers can rephrase a question, pose it differently, or encourage the child to show what she knows. Using the ZPD, we get at the child's best understanding.

Defining Developmentally Appropriate Practice

The idea of Developmentally Appropriate Practice (DAP) does include the idea of the ZPD, although it is not explained in those terms. Because of misunderstandings about the meaning of DAP, the National Association for the Education of Young Children published the *Basics of Developmentally Appropriate Practice: An Introduction for Teachers of Children 3–6* to explain the tenets of the approach (Copple & Bredekamp, 2005). Copple and Bredekamp encourage teachers to meet learners “where they are, taking into account their physical, emotional, social, and cognitive development and characteristics” but at the same time to “identify goals for children that are both challenging and achievable—a stretch but not a leap” (p. 7). There is a recognition that teaching must identify both the independent level of performance that marks the lowest level of the ZPD as well as goals that are beyond what the child can do independently, reaching into the ZPD.

The concept of ZPD expands the idea of what is developmentally appropriate to include things the child can learn with assistance. Vygotsky argues that the most effective teaching is aimed at the higher level of a child's ZPD. Teachers should provide activities just beyond what the child can do on his own but within what the child can do with assistance. Thus, the learning/teaching dialogue proceeds slightly ahead of the child's status at any given time. For example, if adults only provided language stimulation geared to the child's actual speech and not at a level slightly higher, then they would only use baby talk with toddlers and never speak in full sentences. In actual practice, of course, both parents and teachers intuitively add more information and use more complex grammar than the toddler is currently capable of producing. As a result, the child learns more complex grammar and expands her vocabulary.

Another example of how we intuitively use the level of assisted performance is when we deal with the conflicts that naturally arise between young children. When 2½ year-olds are fighting, the teacher points out each child's feelings even though the children may not yet be able to take another person's perspective. Few teachers would want to wait until perspective-taking skills emerge naturally when children are 4 and 5 years of age before asking students to use them.

Vygotsky emphasizes that the child should practice what he can do independently and, at the same time, be exposed to things at the higher levels of the ZPD. Both levels are developmentally appropriate. Teachers must be sensitive to the child's reaction to the support and assistance provided in the ZPD. If the child accepts the teacher's support, then the teacher has hit within the ZPD. If a child ignores help, and still cannot perform at the higher level of the ZPD as expected, then the teacher needs to rethink the support. Perhaps the skill is outside this child's zone or the type of assistance provided is not useful and should be modified. The ZPD helps teachers look, in a more sensitive way, at what support to provide and how the child reacts.

Using the ZPD to Teach

Several researchers have taken the idea of the ZPD and tried to delineate more specifically what goes on within it. Vygotsky was rather vague about exactly how the child reaches the upper limit of the zone. From among the many psychologists who have discussed the ZPD, we have chosen a few who present more detail and whose works help teachers in the practical job of teaching children. Zaporozhets (1978, 1986); Wood, Bruner, and Ross (1976); Newman, Griffin, and Cole (1989); Tharp and Gallimore (1988); Cazden (1981); and Rogoff (1986) have all described what goes on within the ZPD in slightly different ways. Each conception adds to our understanding of the ZPD and how it works, giving guidance to teachers who want to use the ZPD to improve their teaching. More in-depth analysis of theoretical issues associated with the idea of the ZPD, as well as discussion of the implications of this idea for learning in teaching, can be found in the works of such Vygotskian scholars as S. Chaiklin (Chaiklin, 2003) and G. Wells (Wells, 1999).

Amplification

Zaporozhets (1978, 1986) has coined the term *amplification* to describe how to use the child's entire current ZPD to the fullest. The idea of amplification is the opposite of acceleration or speeding up a child's development. "Optimal educational opportunities for a young child to reach his or her potential and to develop in a harmonious fashion are not created by accelerated ultra-early instruction aimed at shortening the childhood period—that would prematurely turn a toddler into a preschooler and a preschooler into a first-grader" (Zaporozhets, 1978, p. 88). Acceleration, Zaporozhets maintains, does not lead to optimum development; it teaches skills that the child is not prepared to learn, because they lie far outside her ZPD. You can teach children some things outside of their ZPD, but this skill or content knowledge will exist as an isolated bit of information that will not be integrated into their world view. Consequently, acceleration does not have a positive impact on developmental accomplishments of the next period. For example, after much training, children as young as 3 years old can be taught to locate the letters on a computer keyboard. This learning, however, does not lead to the development of written speech because it is outside the child's ZPD. Another example can be seen when children memorize the multiplication table before they understand addition. They can be taught to do this, but they will not be able to use it meaningfully to solve problems.

Amplification, on the other hand, builds upon strengths and increases development but does not reach outside the ZPD. Amplification assists behaviors on the edge of emergence, using the tools and assisted performance within the child's ZPD. For example, preschool children learn many things by manipulating objects. Manipulatives can be used to teach concepts such as number or classification, which forms a part of theoretical reasoning at the next stage. Children can use manipulatives to understand a physical relationship, such as that between distance and speed. Children can use this knowledge when they are 9 or 10 and begin to reason about distance and speed in a more abstract way. Therefore, teaching preschoolers the abstract formula for the relationship between speed and distance would not be appropriate.

Scaffolding

Wood, Bruner, and Ross (1976) propose that the expert provide *scaffolding* within the ZPD to enable the novice to perform at a higher level. With scaffolding, the task itself is not changed, but what the learner initially does is made easier with assistance. Gradually, the level of assistance decreases as the learner takes more responsibility for performance of the task (Wood, Bruner, & Ross, 1976). For example, if a child is to count 10 objects, the initial task asked of the child is to count 10 objects (not 3 or 5 or 7). At the level of maximum scaffolding, the teacher counts out loud with the child, holding her finger as she points to each object. At this point, the teacher has most of the responsibility for counting, while the child follows his action. The teacher then gradually begins to withdraw support, just as the scaffolding of a building is taken away as the walls are capable of standing alone. The next time the child counts, the teacher does not say the numbers but still helps her point. Then the teacher may stop pointing at the objects, allowing the child to both point and count on her own.

Wood, Bruner, and Ross (1976) suggest that what the expert does when providing scaffolding may vary. Sometimes the adult might direct attention to an aspect that was forgotten; at other times the adult might actually model the correct manner of doing something. For scaffolding to be effective, however, the expert must enlist the child's interest:

Reduce or simplify the number of steps required to solve the problem so the child can manage them, maintain the child's interest in pursuing the goal, point out the critical features that show the difference between the child's performance and the ideal performance, control frustration, and demonstrate the idealized version of what the child is doing. (Wood, Bruner, & Ross, 1976, p. 60)

Bruner studied scaffolding primarily in the area of language acquisition. He points out that when young children are learning language, parents present the child with mature speech. Not all sentences are reduced to baby talk. However, parents vary the amount of contextual support they give. They restate, repeat the important words that have meaning, use gestures, and respond to the child's utterances by focusing on the meaning of the child's utterances and not the grammatical form. Adults maintain a dialogue with the child as if the child is another adult who understands everything. Parents act as if the child can understand, thus responding to the ZPD and not to the child's actual level of speech production. This is what Garvey called talking with "the future child" (Garvey, 1986). Say that a child points to a tiger at the zoo and says, "Rrrrr," and the parent responds by saying, "Yes, that's a tiger. See her babies? She has three babies." The parent responds as if the child has produced the sentence "Look at the tiger." After repeated exposures to more mature language forms within the ZPD, children begin to acquire grammar. Bruner gave this support a specific name—the *Language Acquisition Support System*, or LASS.

At the beginning of the learning process, the adult provides more active interventions and greater amounts of scaffolding, directing more of the child's behavior than he will later in the process. As the child or novice learns, responsibility for the performance shifts as the learner takes a greater role in producing the behavior. The task of the adult or teacher then becomes one of timing the removal of the scaffolding to enhance the

child's successful independent performance of the final behavior. This shift in responsibility is what Bruner has called the "hand over principle" by which the child who was at first the spectator becomes a participant (Bruner, 1983). The adult or expert hands over the task to the child. In summary, the idea of scaffolding clarifies that the following occurs within the ZPD:

1. The task is not made easier, but the amount of assistance is varied.
2. Responsibility for performances is transferred, or handed over, to the child as the child learns.
3. The support provided is temporary, and supports are removed gradually leading to independence.

The ZPD as Construction Zone

Michael Cole and his colleagues (Newman, Griffin, & Cole, 1989), who worked with children in elementary school classrooms in California, describe the ZPD as a "construction zone." They point out that co-construction is more than the teacher just telling the child what to do. The teacher must be as active in the process as the child. While the child constructs the concept, the teacher is constructing the child's unfolding understanding through questions, probes, and actions. So the teacher strives to understand how and what the child understands. They placed emphasis on the fact that the child does not have a full understanding of the goal or final performance until she has appropriated the concept. Their work helps highlight the importance of both participants in co-construction.

Performance and Competence

Another idea that helps clarify the ZPD is what Cazden (1981) terms "performance comes before competence." Children do not need full knowledge or full understanding of a task before it is taught to them. Competence and understanding are acquired after the task has been performed a number of times. Linda is learning how to add numbers using the Cuisenaire rods. She can correctly line up the correct number of 1s and 5s to make 10, but she can't explain the process. Even when she repeats the teacher's explanation, it appears that she is just repeating the words with little understanding. After a few more practices, the teacher's explanation dawns on her, and she says, "I get it!" As long as the behavior is within the child's ZPD, the lack of complete understanding is not a problem. That understanding will come with continued dialogue and interaction with others.

Structuring Situations

Rogoff studied assisted performance in informal settings, including mother-toddler interactions and interactions between weaving teachers and apprentices in Mexico (Rogoff, 1986, 1990; Rogoff & Wertsch, 1984). Rogoff argues that the adult or expert will grade or structure tasks into different levels or subgoals. These subgoals are then broken down further or are changed, recombined, and redefined as the ZPD is explored in the interaction between the participants. By choosing toys, equipment, materials, or tools, the expert limits and structures the task even before the learner appears. Later, as the ZPD is explored, the expert adjusts the task, breaking it into

smaller, more manageable tasks that the learner can do. In addition, the expert might build redundancy into the interaction, repeating directions or modeling actions several times. Structuring aids the learner in performing at the highest level of the ZPD. Rogoff emphasizes the importance of the changes the expert must make to assist performance. The changes in adult structuring and support follow the learner's lead and are not arbitrarily imposed based on the content of the material or an abstract idea of how the information should be taught. Even in apprenticeship situations, although different from those found in the classroom, the expert still breaks goals into subgoals that are redefined and recombined as the student's performance improves.

Dynamics of Scaffolding within the ZPD

Tharp and Gallimore (1988) directed the Kamehameha Elementary Education Program (KEEP) in Hawaii and worked with elementary-aged children. They have proposed a four-stage description of the ZPD that goes beyond the definition commonly used by most researchers in the Vygotskian framework. The most distinctive aspect of their approach is the concept of performance in the ZPD as a circular, recursive process, rather than a linear one. Their concept of the ZPD is similar to the one mentioned previously with the added idea that once a concept or skill is appropriated, there are conditions under which the child may need scaffolding anew. When confronted with new and different contexts, the child may need support in transferring the skills to a new situation.

The idea of the ZPD has important implications for education. It provides alternative perspectives on the way we assist children in the learning/teaching process, how we assess children, and how we define developmentally appropriate practice. In the chapters that follow, we will discuss how to apply these ideas in different classroom situations.

For Further Reading

- Chaiklin, S. (2003). The zone of proximal development in Vygotsky's analysis of learning and instruction. In A. Kozulin, B. Gindis, V. Ageyev, & S. Miller (Eds.), *Vygotsky's educational theory in cultural context*. New York: Cambridge University Press.
- Rogoff, B., & Wertsch, J. (Eds.). (1984). *Children's learning in the "zone of proximal development."* San Francisco: Jossey-Bass.
- Wells, G. (1999). The zone of proximal development and its implications for learning and teaching. In *Dialogic inquiry: Towards a sociocultural practice and theory of education*. New York: Cambridge University Press.