



VYGOTSKY

for

EDUCATORS

Yuriy V. Karpov

6 Learning at School: Children Not Only Learn; They Develop As Well

As briefly discussed in Chapter 1, Vygotsky and his followers view school instruction as the major avenue for mediation and, therefore, as the major contributor to children's development during the period of middle childhood. According to the Vygotskians, the major reason for the development-generating effect of school instruction relates to students' acquisition of scientific knowledge, which can be contrasted with the everyday life knowledge of preschoolers.

Everyday life knowledge is the result of generalization of children's personal experience in the absence of systematic instruction. Therefore, such knowledge is unsystematic, empirical, not conscious, and often wrong. For example, the concept of a bird that young children develop includes the ability to fly as the major characteristic of birds; therefore, preschoolers do not define a penguin as a bird. Similarly, a three-year-old child, having observed a needle, a pin, and a coin sinking in water, comes to the wrong conclusion that all small objects sink and begins to use this rule to predict the behavior of different objects in water.¹ Despite its "unscientific" nature, everyday life knowledge plays an important role in children's learning as a foundation for the acquisition of scientific knowledge. For example, learning different species by school students requires that they have some understanding what animals are and know at least several representatives of the animal kingdom.

In contrast to everyday life knowledge, scientific knowledge is the result of the generalization of the experience of humankind that

is fixed in science (understood in the broadest sense of the term to include both natural and social sciences as well as the humanities), and it is acquired by students consciously and according to a certain system. In the examples given earlier, the scientific concept of a bird, rather than including the ability to fly, includes such characteristics as being a vertebrate, warm-blooded animal with feathers, which lays eggs; similarly, the scientific rule that makes it possible to predict the behavior of objects in water is Archimedes' law, not the size of an object.

According to the Vygotskians, the acquisition of scientific knowledge results in several important outcomes. First, it transforms students' everyday life knowledge; students start "rethinking" what they learned before from the perspective of the newly acquired scientific knowledge ("Wow, I thought a bat is like a pigeon; but no, it is like a mouse!"). Second, students start using scientific knowledge as a tool of their thinking and problem solving; figuratively speaking, school students start looking at the world through the glasses of scientific knowledge ("What is a dolphin? Let me think ... it is warm blooded, and it feeds babies milk. It is a mammal!"). And, most importantly, the acquisition of scientific knowledge "plays a decisive role in the child's cognitive development."² Specifically, students' thinking becomes much more independent of their personal experience; they become "theorists" rather than "practitioners." The following section provides a more detailed analysis of how school instruction promotes development.

How School Instruction Promotes Development

The first solid set of empirical data supporting the Vygotskian view of the role of school instruction in children's development was obtained in the classical cross-cultural study performed by Vygotsky's closest friend and colleague, A. Luria.³ This study became possible because of the fact that, in the early 1930s, the system of school instruction was just established in many regions of Uzbekistan and Kirghizia, Asian

republics of the former Soviet Union. This situation allowed Luria and his research team to go to remote villages of those republics and study various mental processes of adult villagers, some of whom were illiterate, while some had already enjoyed one or two years of schooling.

Luria's study was followed by many other cross-cultural studies, as well as studies evaluating developmental outcomes of school instruction within one culture.⁴ By now, plenty of data about the role of school instruction in the development of children's various mental processes have been collected. Let us review these data.

Perception. Illiterate and literate adults were shown different geometric shapes (squares, circles, triangles, etc.), some of which were drawn by lines, some made up of dots, and some were solid-colored; they were asked to identify among the shapes those that looked alike. It turned out that illiterate adults when performing this task associated the shapes with objects in their environment; for example, they identified a triangle and a square made up of dots as similar because both "looked like watches." Literate adults, in contrast, identified as similar, for example, a triangle drawn by lines and a triangle made up of dots, because "both are triangles." Thus, the perception of illiterate adults was dominated by their everyday life experience, whereas the perception of their literate neighbors was dominated by abstract geometrical concepts they learned at school.⁵

Memory. If you are asked to memorize a list of words (winter, bank, girl, book, orange, etc.), you probably will try to use a strategy to make logical connections between the words. For example, you may create a story about a girl who, in the winter, went to the bank to withdraw money in order to buy a book and an orange. Or you may simply draw a mental picture of a girl, who, in the winter, sits in the bank, eating an orange and reading a book. Such strategies aimed at organizing unrelated pieces of information into a meaningful system are called mnemonics, and they have been shown to enormously expand our ability to memorize and recall. The use of mnemonics may seem natural to you, but it is not: Children master them in the context of learning at school. This is why literate people perform much

better than illiterate people on memory tasks in which they are asked to memorize and recall new information.⁶ Even one year of schooling results in substantial improvement of children's memory: At the end of the first grade, children demonstrate much better memory than kindergarteners of the same chronological age.⁷

Linguistic Awareness. Although preschoolers do not experience problems with the practical use of grammatically correct expressive language, their linguistic awareness remains at a very poor level. As a matter of fact, a word is often viewed by preschoolers as a property of an object just as the object's size or shape. Therefore, for a preschooler, the sentence "There are twelve chairs in the room" consists of twelve words, whereas the sentence "Katja ate all the patties" does not have any words because "she ate them all."⁸ Similarly, a preschooler cannot analyze the sound components of words; therefore, the child believes that the word "cat" is longer than the word "kitten," because "cat is a grown-up, and kitten is a baby." Studies have demonstrated that linguistic awareness develops in children as a result of formal reading instruction. In particular, by the end of the first grade, children demonstrate a much better ability to analyze the sound components of words than do kindergarteners of the same chronological age.⁹

Classification. Illiterate and literate adults were shown the pictures of four objects and were asked to find an object that did not belong to the group. When solving these problems, illiterate people turned out to proceed from "concrete ideas about practical [situations] in which appropriate objects could be incorporated."¹⁰ For example, an illiterate adult, when shown pictures of a hammer, a saw, a log, and a hatchet, said:

They all fit here! The saw has to saw the log, the hammer has to hammer it, and the hatchet has to chop it... You can't take any of these things away. There isn't any you don't need!¹¹

In contrast, literate adults when approaching this task applied the general category "tools" and concluded that, among all the objects, only a log did not fit this category.

Hypothetical Deductive Reasoning. According to Piaget, hypothetical deductive reasoning is an important ability that develops when children transit to the stage of formal-logical thought.¹² One of the major tools of hypothetical deductive reasoning is the *sylogism*: a logical argument in which two premises lead to a definite conclusion. For example, the premises that “cotton can grow only where it is hot and dry,” and that “in England it is cold and damp,” lead to the conclusion that cotton cannot grow in England. However, although such a conclusion looks obvious to literate people, it is not the case for illiterate people. What follows is an example of an illiterate adult’s approach to the above syllogism:

“Cotton can grow only where it is hot and dry. In England it is cold and damp. Can cotton grow there?”

“I don’t know.”

“Think about it.”

“I’ve only been in the Kashgar country. I don’t know beyond that.”

“But on the basis of what I said to you, can cotton grow there?”

“If the land is good, cotton will grow there, but if it is damp and poor, it won’t grow. If it’s like Kashgar country, it will grow there too. If the soil is loose, it can grow there too, of course.”

The syllogism was then repeated. “What can you conclude from my words?”

“If it’s cold there, it won’t grow. If the soil is loose and good, it will.”

“But what do my words suggest?”

“Well ... we’re ignorant people; we’ve never been anywhere, so we don’t know if it’s hot or cold there.”¹³

To summarize, in contrast to the responses obtained from literate people, the most typical responses of their illiterate neighbors

were a complete denial of the possibility of drawing conclusions from propositions about things they had no personal experience of, and

suspicion about any logical operation of a purely theoretical nature, although there was the recognition of the possibility of drawing conclusions from one’s own practical experience.¹⁴

Thus, schooling is instrumental in the development of hypothetical deductive reasoning.¹⁵

IQ. As opposed to the traditional view of IQ scores as genetically predetermined, more and more data come to indicate that children’s intellectual performance is grossly determined by schooling. In particular, such data have been obtained by studying children of almost the same chronological age who, for different reasons, entered school at different ages. One study evaluated intellectual performance of children who belonged to the same age group (either 8 years old or 10 years old) but had received a year’s difference in schooling. It turned out that intellectual performance of 8-year-olds with three years of schooling was closer to intellectual performance of 10-year-olds with four years of schooling than to intellectual performance of 8-year-olds with two years of schooling. Similar results were obtained in another study performed with fourth, fifth, and sixth graders: Intellectual performance of children in each grade was substantially below the intellectual performance of chronologically younger children in the next higher grade.¹⁶

Self-Analysis. As discussed in more detail in the next chapter, by the age of early adolescence, a child in literate societies develops the ability to analyze more or less objectively his or her personality, cognition, and emotions. It turns out that the development of the ability to do self-analysis in terms of psychological traits is far from being a natural advancement; rather, it requires formal-logical thought, which, as discussed, is a direct outcome of schooling. Illiterate adults, when asked to do self-analysis, either do not grasp the question at all or describe themselves in terms of external material circumstances and everyday situations. What follows, is a self-evaluation of a barely literate 18-year-old woman:

After a lengthy conversation about people's characteristics and their individual differences, the following question was asked:

What shortcomings are you aware of in yourself, and what would you like to change about yourself?

"Everything's all right with me. I myself don't have any shortcomings, but if others do, I point them out ... As for me, I have only one dress and two robes, and those are all my shortcomings." ...

No, that's not what I'm asking you about. Tell me what kind of a person you are now and what you would like to be. Aren't there any differences?

"I would like to be good, but now I'm bad; I have few clothes, so I can't go to other villages like this." ...

And what does "be good" mean?

"To have more clothes."¹⁷

To conclude, numerous data have provided strong empirical support to the Vygotskian idea that school instruction greatly determines different aspects of children's development during the period of middle childhood.

The Quality of School Instruction Determines Its Developmental Outcomes

Although, as discussed, even one or two years of schooling lead to serious advancements in children's development, the depth and extent of these advancements will depend on the quality of instruction. Indeed, as discussed in Chapter 1, Vygotsky emphasized that a development-generating effect of instruction is determined by whether or not the process of instruction has been organized in the proper way: "The only good kind of instruction is that which marches ahead of development and leads it."¹⁸ In other words, "good" instruction should target the "ceiling" level of children's zone of proximal development rather than the current level of their functioning. As an example of instruction that did not meet this requirement, Vygotsky

mentioned an instructional system that had been used in the former Soviet Union in the 1920s:

For a time, our schools favored the "complex" system of instruction, which was believed to be adapted to the child's ways of thinking. In offering the child problems he was able to handle without help, this method failed to utilize the zone of proximal development and to lead the child to what he could not yet do. Instruction was oriented to the child's weakness rather than his strength, thus encouraging him to remain at the preschool stage of development.¹⁹

To a certain extent, the preceding criticism by Vygotsky can be addressed to the contemporary traditional system of school instruction. As briefly discussed in Chapter 1, all traditional school curricula have been influenced by the belief that instruction should follow development, in other words, that we should teach knowledge at the developmental level that the child has already reached. In American education, to make it worse, the "traditional" underestimation of the importance of instruction for children's development has been aggravated by behaviorist ideas about teaching and learning. These ideas continue to implicitly influence American education despite the fact that behaviorism has not been the dominant learning theory for more than half a century. Behaviorists understand teaching as conditioning new responses in students, and learning as mastery of these responses by students' by means of drill-and-practice and rote memorization. Thus, learning outcomes are reduced by behaviorists to correct responses (answers); the idea that school instruction should lead to certain developmental outcomes, such as higher-order reasoning, is simply ignored by behaviorists.

The poor learning and developmental outcomes of American school instruction have been the focus of attention of American society since the publication of the 1983 report of the National Commission on Excellence in Education with a title that speaks for itself: *A Nation at Risk*. The report presented the results of various studies that revealed, in particular, that among 17-year-old students

40% could not draw inferences from a written text, two-thirds could not solve several-step math problems, 80% could not write a persuasive essay, and that on many academic tests American students performed well below their peers from other industrialized societies. Reflecting on these data, the report said that the American nation was committing "an act of unthinking, unilateral educational disarmament."²⁰

In 2008, the U.S. Department of Education published the report *A Nation Accountable: Twenty-Five Years after A Nation at Risk*. The goal of the report was "to review the progress we have made" over 25 years, but the general conclusion was already formulated on the first page of the report: "If we were 'at risk' in 1983, we are at even greater risk now."²¹ In particular, the report indicated that "educational achievement of 17-year-old students has largely stagnated" since *A Nation at Risk* publication.²² Studies and observations of American students' learning outcomes have led to the conclusion that

most students have command of lower-level, rote skills, such as computation in math, recalling facts in science, decoding words in reading, and spelling, grammar, and punctuation in writing.... Many if not most students have difficulty using what they know to interpret an experiment, comprehend a text, or persuade an audience. They can't rise above the rote, factual level to think critically or creatively. They can't apply what they know flexibly and spontaneously to solve ill-structured, ambiguous problems that require interpretation.²³

To summarize, "current curricula and teaching methods successfully impart facts and rote skills to most [American] students but fail to impart high-order reasoning and learning skills."²⁴ In Part II of the book, I discuss in more detail what is wrong with the traditional system of school instruction in the United States, as well as in some other countries, and present the Vygotskian *theoretical learning* approach to instruction that has been shown to result in impressive learning and developmental outcomes in school students. In particular,

when learning math under this approach, elementary school students "evidenced mathematical understanding typically not found among U.S. high school and university students."²⁵

How to Promote Children's Interest in Learning

Just like any mediation, school instruction can not be imposed on passive children; children will not learn if they do not want to learn. As Vygotsky noted, "the problem of interest in instruction is not whether or not children learn with interest; they never learn without interest."²⁶ The point is, however, that children's learning can be propelled by different interests.

As discussed in Chapter 4, when children first come to school, they are interested in performing the role of a school student, which brings them closer to the attractive adult world. This is why they are so excited about all external attributes associated with the role of a student, including such of its attributes about which in the near future they will cease to be excited. The famous Russian Vygotskian, D. Elkonin, who spent many years as an elementary school teacher, shared with us a recollection of his first day as a schoolteacher, which was also the first day of school for his students. At the end of the day, he told the children that the classes were over and they could go home. The children, however, kept sitting and looked somewhat disappointed; finally, one of them asked: "And what about the homework?" In order to not disappoint the children further, Elkonin gave them some task as homework and immediately forgot about it. The next day, however, the first thing he saw when he entered the classroom were sheets of paper in front of the children with the homework completed; all the children were waiting impatiently for him to review their homework and give them a grade. Thus, for those children, homework was still something they wanted as an important indicator of their new social roles of students, rather than being a burden to be avoided.

I myself have a similar recollection about my first year as a school student. In those days, students in Russia had to wear a school uniform, and I remember how I insisted on wearing this uniform even when going to a supermarket with my parents: I was proud that I was not a preschooler any more, and that everybody could see it.

Children's excitement about social roles of school students has been clearly demonstrated in one study with older preschoolers.²⁷ "Positive" and "negative" adjectives (clean – dirty, good – bad, fast – slow) were written on separate cards. In front of the child, there were two boxes with attached pictures: on one picture, there were school students with bookbags; on the other, playing children. The researcher said to the child pointing at the boxes: "These are school students, who study at school; and these are preschoolers, who are playing. I will be reading different words. You should think whether each word suits better a school student or a preschooler and put the card with this word into the proper box." After that, the experimenter read aloud the adjectives in random order. After reading an adjective, the experimenter gave the card to the child, who put it into one of the boxes. The results of this study demonstrated that almost all the children attributed the "positive" adjectives (clean, good, fast, etc.) to school students and the "negative" adjectives (dirty, bad, slow, etc.) to preschoolers.

To be sure, parents should fully support and encourage children's view of their new roles and responsibilities as students as very important and respected. For example, the time when a child is doing homework should be as respected by the family as the time when the child's father or mother is preparing an important presentation for the next day. From this perspective, it is much better to postpone a family dinner for 30 minutes to "let John finish his homework" than saying, "dinner is ready; you will finish homework after dinner." Similarly, parents should not discourage young pupils' ecstatic attitude toward their teachers as "supermen" who know everything (as I discuss in Chapter 10, ironically, teachers themselves sometimes intentionally

destroy this attitude in children). Therefore, the argument "the teacher knows better!" that young pupils often use in their disputes with parents should not be easily dismissed by parents or, even worse, irritate them as an indicator of a "sad" fact that there is another significant adult in their children's lives.

To be sure, by itself, children's interest in performing the role of school student cannot serve as learning motivation: After all, to enjoy this new role, it is not a must for children to learn; it is sufficient to come to school with a bookbag, sit in the classroom, and follow some simple school regulations. This interest, however, is a good foundation for the development in children of learning motivation. Traditionally, learning motivation is divided into two types: extrinsic motivation and intrinsic motivation.

Extrinsic Learning Motivation. Extrinsic learning motivation relates to learning motivated by external desirable outcomes; most commonly, by various rewards. In the Introduction, I already discussed some shortcomings of the behavior modification methodology based on the use of rewards. In the field of learning, rewards have been shown to diminish students' intrinsic interest in learning (that is, interest in learning per se). In particular, because learning outcomes are traditionally evaluated by the use of grades, rewards are often issued for good grades; this practice redirects students' attention from the importance of learning to the importance of earning good grades. Good grades, however, do not necessarily reflect good learning but may, for example, be outcomes of meaningless drill-and-practice, rote memorization, or, even worse, cheating on tests.

The problems associated with the use of rewards have led researchers to recommend that rewards should be used as little as possible; if still used, they should be as modest as possible and be withdrawn as soon as possible.²⁸ In other words, extrinsic learning motivation may be used as a temporary solution that helps engage students in learning, but it should not become the permanent "engine" that drives student learning.

Intrinsic Learning Motivation. Intrinsic learning motivation is defined as learning for the sake of learning, that is, because learning itself is enjoyable. As opposed to extrinsic motivation, intrinsic learning motivation leads to students' learning above and beyond the school requirements, and their selecting challenging learning tasks. Intrinsically motivated students also demonstrate greater task persistence and better learning outcomes than their extrinsically motivated classmates.

How does intrinsic learning motivation develop? To answer this question, let us remember the Vygotskian analysis of the development of new motives presented in Chapter 1. Just like any new motive, intrinsic interest in learning may sometimes develop spontaneously in the context of children's learning driven by a reward. The following example illustrates this point:

In an effort to get my daughter to try ice skating ... I promised an ice-skating outfit for circling the rink without touching the wall. By the end of that session she accomplished the task. She was so delighted by her sense of developing competence, and intrinsically motivated to continue to develop her skills, she forgot about the promised reward.²⁹

Everybody will probably agree, however, that it would not be realistic to expect such an outcome in a classroom on a regular basis. Therefore, having used children's enjoyment of their roles of school students or external rewards to engage them in learning, adults should purposefully mediate the development in children of intrinsic learning motivation.

The major role in mediating the development in children of intrinsic learning motivation should be played by teachers (see Chapter 8 for a discussion of this matter), but the role of parents in this respect should not be underestimated either. Even the kind of questions parents ask their children when they come home from school (e.g., "What grades did you get today?" or "What have you learned today?")

will make a difference in terms of what kind of attitude the children develop toward learning: learning for the sake of getting good grades, or learning for its own sake. This is not to say that the grades should be ignored; they simply should be considered one of the indicators of good learning rather than an end in itself. Similarly, if parents are checking their children's homework, they should not pay attention only to whether or not the answer is correct; rather, they should ask questions such as "How did you solve this problem?" or "How can you double check if the answer is correct?" and praise the children for their "good thinking" and efforts rather than for the correct answer. In simple words, everything parents do to redirect their children's attention from outcomes of learning, such as grades, to the process of learning as important and thrilling in itself will contribute to the development of their intrinsic learning motivation. To the contrary, a parent saying to his or her son, "Don't worry about math, I was never good in it and I make a good living"³⁰ will hardly be beneficial for the development of his intrinsic interest in learning math.

Conclusion: Schooling as the Major Avenue for Mediation during the Period of Middle Childhood

Today, it is impossible to deny the leading role of school instruction in children's development: Even one or two years of schooling have been shown to result in great advancement of children's cognitive abilities. But *how well* school instruction will promote children's development will depend on three major factors. One such factor was discussed earlier: To learn successfully and benefit from school instruction, children should come to school with the major components of school readiness in place. Prerequisites for success, however, by themselves do not guarantee success. In this chapter, I have discussed the other two major factors that determine the developmental outcomes of school instruction.

The first factor is *what and how* children are taught. Teaching children “correct responses” through drill-and-practice or rote memorization, which is typical of traditional elementary school curricula all over the world, and of the American traditional curricula even beyond elementary school, is not especially advantageous for their cognitive development. In Part II of the book, I discuss in more detail the major shortcomings of traditional curricula and present alternative approaches to instruction. As readers will see, some of these alternative approaches (which are very popular among educators) aggravate rather than overcome the shortcomings of the traditional curricula, whereas some others do provide teachers with a fruitful alternative to traditional school instruction.

To benefit from school instruction, however, children should be actively involved in the process of learning. Therefore, the second factor that determines the developmental outcomes of school instruction is students’ learning motivation. As discussed, intrinsic learning motivation – that is, learning for the sake of learning – is more advantageous in this respect than extrinsic learning motivation, that is, learning for the sake of external rewards. As discussed in Part II, *what and how* children are taught strongly influences what kind of learning motivation, if any, children will develop. Parents, however, should also do their best to promote intrinsic interest in learning in their children by means of asking them questions and making statements aimed at redirecting their attention from outcomes of learning to the process of learning as an interesting and self-rewarding activity.