

Haenen, J. (2000). Gal'perian instruction in the ZPD. *Human Development* , 43 (2), 93-98

## Gal'perian instruction in the ZPD

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Key words: Vygotsky, Gal'perin, Sociocultural psychology, Learning, Instruction, Zone of Proximal Development (ZPD)

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*Date of submission:* 14 February 2000

### **Gal'perian instruction in the ZPD**

Arievitch and Stetsenko's article (this issue) on Piotr Gal'perin's approach to cultural tools and cognitive development, illustrates the theoretical transformation currently taking place within educational psychology. The Russian psychologist Lev Vygotsky (1896-1934) has certainly become one of the inspiring founders of this transformation. As a psychologist following in his footsteps, Piotr Gal'perin (1902-1988) could justifiably be called a Vygotskian, although he departed from Vygotsky's sociocultural theory and took the next step by further developing its educational implications. Until now, Gal'perin stands apart from Western educational psychology, but several authors have mentioned the potential of his work. Apart from Arievitch and Stetsenko, these are Amano (1999), Arievitch & Van der Veer (1995), Gallimore & Tharp (1990), Grigorenko (1998), Haenen (1996, 1996b), Karpov & Haywood (1998), and Wertsch (1995). In Russian psychology, Gal'perin's name is well-known and widely acclaimed. Arievitch and Stetsenko give an overview of Gal'perin's position on instruction and its relation to cognitive development. I will add to their article by briefly sketching one historical aspect of Gal'perin's place in Russian educational psychology. Then, I will illustrate his approach using the case of handwriting, a basic cultural tool mediating the child's cognitive functioning.

#### **The historical context**

In the former Soviet Union from the 1920s onwards, research in educational psychology was given considerable moral and financial support. An especially noteworthy event is the adoption of a party resolution entitled "On the work of the RSFSR Academy of Pedagogical Sciences and on strengthening its ties with the schools and pedagogical research centres." This resolution, announced in 1958, indicated the lines along which the Academy should proceed in order to bridge the gap between its research work and the practical demands of the schooling and educating of children. The resolution extended the network of experimental schools and of laboratory schools established under the RSFSR Academy of Pedagogical Sciences (Haenen, 1996). El'konin (1961), who called these newly established experimental schools "laboratories of

normal child development,” emphasized that already before the resolution there had been an outstanding tradition of conducting research on the basis of new arrangements for teaching and learning inside the schools. But now it became possible to apply and (re-)evaluate in the classroom the accumulated research findings and to design a longitudinal research project based on a macrogenetic approach to mental development. This interesting period in the development of Russian psychology is extensively described and reviewed by El'konin (1961), El'konin & Davydov (1966), and Zankov (1977).

In short, even more than before, the classroom itself became the laboratory of Russian educational researchers. One could say that much successful research in Russian psychology can be traced to this highly favourable research context, in which the impact of the schooling and educating of ordinary children is studied under the conditions of systematic school experiments. Several Western authors (Popkewits, 1984; Simon, 1978) have mentioned this experimental approach as the first one of the main characteristics of Russian educational psychology.

At the time, El'konin had become director of the Laboratory of the Psychology of the School Child. This laboratory was part of the Institute of Psychology of the RSFSR Academy of Pedagogical Sciences. El'konin and his associates (among them Davydov) set up one experimental first-grade class at school No. 91, located in the Krasnopresnenskii District of Moscow. In the first (1959-60) schoolyear of their experiments, they decided not to make changes in all the subject areas but to restrict their experiments to those sections of which they already had sufficient experimental data. To begin with, they decided to only introduce changes to the school curricula for elementary reading and arithmetics. El'konin supervised the curriculum of reading, while Davydov took charge of arithmetics.

### **Gal'perin's approach**

According to El'konin (1961), to realize these educational changes, they used the results that had been achieved in previous research done by Zankov, and by Gal'perin and his co-workers. In particular, it appeared that Gal'perin's and his co-workers' research were of great importance for

the changes to the two curricula of reading and arithmetics El'konin and Davydov had had in mind. To reorganize the teaching-learning processes in both curricula they adopted Gal'perin's approach. His influence on El'konin's and Davydov's design of their first experimental curricula brought Gal'perin scientific prestige and made him a main figure of Russian psychology. What is Gal'perin's approach about?

Basically, Gal'perin wants to arrange instruction in such a manner that the students are always fully in the picture as to the distinctive features of the learning task. At the very beginning of the teaching-learning process, Gal'perin provides the students with the means to orient themselves systematically in the subject to be studied, and, as Arieviditch and Stetsenko (this issue) put it, "to deal conceptually with a range of objects and phenomena extending far beyond the immediately studied area" (this point can be nicely illustrated by the case of handwriting, see below). This requires that the knowledge to be acquired should be presented as a meaningful whole, as some kind of "tomorrow's knowledge." First students have to understand and accept the affective, motivational and cognitive value of the knowledge before the actual appropriation and ability to use it is at stake. As a result, the students feel capable of performing the tasks and will reach a higher degree of independence from the teacher in the course of instruction. This can be considered as one of the practical consequences of Vygotsky's concept of "developmental teaching" and its maxim that education "is only useful when it moves ahead of development" (Vygotsky, 1987, p. 212). According to Vygotsky, education should lead development in order to call to life those functions that "are in a state of maturation lying in the zone of proximal development" (p. 212). Gal'perin ensures the students' initiation into the learning task and their first steps in Vygotsky's "zone" by starting the teaching-learning process with an extensive phase of orientation. According to Arieviditch and Stetsenko (this issue), this type could be called "systemic-theoretical instruction" in which "the character of knowledge itself ... and the way it is presented (differ) radically from the other types of instruction." In current educational parlance,

Gal'perin's approach integrates aspects of self-regulated learning (especially metacognitive strategies) as related to classroom academic performance.

Gal'perin and his co-workers designed experimental curricula for such educational subjects as handwriting, elementary arithmetics, elementary grammar of the Russian language, and geometrical concepts. Let me illustrate this with the aid of a method to teach the motor skill of handwriting in elementary school (Gal'perin, 1982, 1989, 1992). It has been instrumental in providing the learning-theoretical basis for the Dutch curriculum project on "Handwriting in the elementary school" (Van Engen, 1994). This writing method is currently being used by about one-third of the Dutch elementary schools (i.e. about 2000 schools), has gained a growing influence on Dutch elementary education and has been favourably reviewed because of the explicitly elaborated learning-psychological vantage point within a sociocultural framework (Haenen, 1996, pp. 154-161).

### **The motor skill of handwriting**

In the early 1950s, Gal'perin and his co-workers took as their starting point a psychological analysis of the formation of the motor skill of handwriting (Pantina, 1957). The most basic factors in the development of the writing skill are both the presence of the correct motor image and the shift as quickly as possible from visual to motor control strategies of the writing movements. To achieve such a shift, Gal'perin decided to develop a teaching method based on the dissection of the grapheme into segments. What, however, could serve as the basis of such a dissection? According to Gal'perin (1982), the new method they developed was based on Vygotsky's ideas about units of analysis in psychological research. Vygotsky (1987) defined a unit as "a product of analysis that possesses all the basic characteristics of the whole" (italics in the original, p. 46). In writing graphemes, where the learning task consists of the correct reproduction of shapes, the unit of the shape can be found in a "segment of continuous movement." Where the line begins or changes its direction, indices are added so that each discrete segment is located between two such indices. In Figure 1, taken from the Dutch teacher manual, the indices of the grapheme m are

indicated. This figure illustrates what Gal'perin has called a generalized procedure for analyzing and modeling a grapheme. Each segment of a grapheme differs from every other in length and position and consequently, indices are necessary as a reference, otherwise no exact reproduction of a grapheme can be made. Gal'perin distinguished two types of indices: (1) dividing indices (often points) for marking the beginnings and endings of a segment, and (2) guiding indices for maintaining the movement of very long segments. These indices bear a resemblance to the numbered arrows, proposed by Berninger et al. (1997), who designed a treatment to improve handwriting. Both Gal'perin and Berninger et al. provide support for orientation during the writing of graphemes.

----- about here Figure 1 -----

Gal'perin taught the children to establish independently (though under the teacher's guidance) the inventory of indices through analyzing the shapes of graphemes. He designed a teaching strategy that has the special flavor, which has become Gal'perin's trademark. This strategy is characterized by its emphasis on a proper orienting basis and its control of vocalizations during the execution of the learning task. Briefly, it proceeds as follows (Haenen, 1996). The teacher offers a model of a grapheme, explains the purpose of the indices, and shows how one can isolate them. The explanation is accompanied by a demonstration of only the first grapheme. Instead of providing the inventory of indices, the teacher explains the principle of identifying them, namely, they are placed where the line begins, ends and changes direction. Beginning with the second grapheme, the pupils independently (though under the teacher's guidance) isolate all indices, while the teacher merely corrects the mistakes. Thus, the pupils establish for themselves the inventory of indices and acquire a general principle, which is applicable to any particular grapheme.

In order to assess the results, Gal'perin designed a test series. After the pupils had been taught, they were asked to correctly copy unfamiliar and unknown graphemes from the Cyrillic, Georgian and Roman alphabets. The pupils easily analyzed and copied the given graphemes. It

appeared, that transfer was not only complete in the specific domain of writing Russian graphemes, but extended to other alphabets and to graphic representations in general, in which taking into account the position of objects on a plane is relevant, such as blueprints, drawings, and trajectories of moving bodies. Gal'perin and his co-workers were surprised at how easily the pupils copied graphic displays. Apparently, Gal'perin's approach had prepared the pupils to transfer the method of analyzing graphemes far beyond its boundaries. Due to this “near-far transfer” (Brainerd, 1975), it is not surprising that other researchers have been paying special attention to Gal'perin's handwriting instruction.

The example of handwriting illustrates Arieivitch & Stetsenko's concluding point that the “central property that defines the developmental potential of ... instruction ... is the quality of cognitive tools.” In so doing, Gal'perin has developed a type of instruction capitalizing on insightful learning that has been integrated into activity. When this is done properly, instruction becomes a “design science” (Salomon & Perkins, 1998, p. 20). I would go on to say that Arieivitch & Stetsenko have made a contribution to the understanding of Gal'perin as an “instructional designer.”

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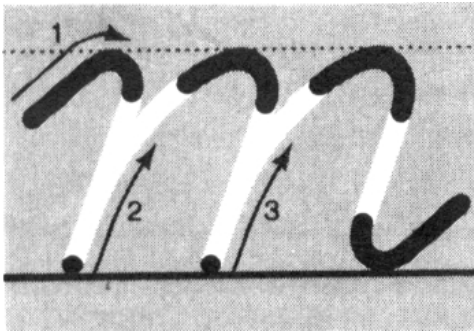
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## Figure Caption

Figure 1. Example of the model used to introduce the principle of analyzing a grapheme in Dutch elementary handwriting instruction (Van Engen, 1994, p. 70).



slantingly down  
upwards – down  
upwards – down  
stop

upwards – down  
upwards - stop  
turning down

turning upwards