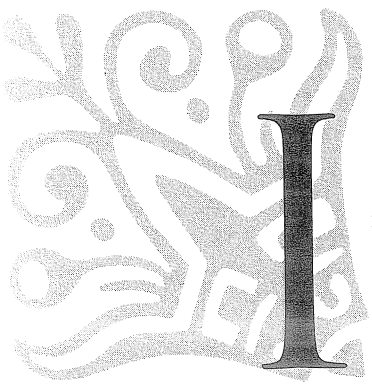
CHAPTER 11

HIGHER LEVEL THINKING



In teaching for thinking, the concern is not how many answers students know, but what they do when they do not know; the goal is not merely to reproduce knowledge, but to create knowledge and grow in cognitive abilities. These were tenets of the first programs for gifted children, and the field led the way for general education to embrace the agenda of greatly improving the quality of thinking in all children.

WHAT WE KNOW

A thinking skill is a competency that contributes to some type of reasoning, which means that there are thinking skills involved in reading, problem solving, creativity, and all other forms of thinking. It is more than a technical skill or practice; it is one factor upon which good contemplation, study, reflec-

tion, examination, resolution, decision, evaluation, appraisal, and other types of reasoning are based (Swartz & Perkins, 1990).

Most thinking skills develop in the first few years of a child's life, which points to the crucial variable of interactions with significant adults, primarily parents, grandparents, older siblings, caregivers, and teachers. Because children's mental development is highly correlated with the complexity of language in their environment, it should not be a surprise to see a decline in development in homes where passive television watching and minimal time for family conversation is the norm (Costa & Lowery, 1989).

Teachers, in particular, shape children's thinking through effective instruction and classroom climate (Coleman & Cross, 2005; Costa & Lowery, 1989). Teachers must have a deep respect for students, listen to them to understand their ideas and thought processes, value their effort to think by allowing time for it, encourage open discussion and active learning, accept errors that will come as thinking experimentation occurs, and give supportive and specific feedback to the students (Udall & Daniels, 1991; VanTassel-Baska, 1994). In this environment and with quality instruction, improvement can be seen in the following broad areas of thinking: awareness (noticing how thinking and resolution feels); effort (investing in the process); attitude (feeling responsible for thinking); organization (learning strategies); subskills (learning the components of skills); and smoothness (making new patterns of thinking more efficient; Swartz & Perkins, 1990, pp. 21–23). Because of the complex merger of these components with an individual's prior knowledge of the topic, general mental capacity, and personality, improving thinking begins at the level of reorganization in the person's mind through the integration of new strategies and then practice.

During the 1970s and 1980s, investigations into the thinking processes of gifted children led to the question of whether instruction in thinking skills was needed. Gifted students appeared to be superior in their thinking, and in fact, it was often that characteristic that prompted identification of a child as gifted (Anderson, 1986; Feldhusen, 1989; Spitz, 1982; Ward, 1979). More recently, attention has been focused on how thinking varies among individuals. Shore and Kanevsky (1993) reported seven ways in which gifted individuals differ in their thinking processes:

- they have more extensive knowledge and use it more effectively;
- they utilize metacognition more efficiently and more often;
- they spend more time on the cognitively complex parts of problem solving and then quickly solve and report solutions;
- they understand problems better especially in terms of commonalties and transfer;
- they employ assumptions that they systematically evaluate;
- they are flexible in choosing strategies and points of view; and
- they enjoy and create complexity and challenge around their tasks (pp. 137–139).

Sternberg and Grigorenko (1993) considered how thinking styles impact the identification of children for gifted programs and the instruction procedures that are employed in those programs—everything from matching styles with the teacher, to benefiting from the components of the programs. Each child responds differently to discussions, independent studies, games, drill, and the like. Sternberg and Grigorenko used the metaphor of mental self-government to explain their theory: The legislative function creates, imagines, and plans; the executive function implements; and the judicial function evaluates. They believed individuals favor one of these functions over the others and that it matters in how thinking develops.

In the last two decades, researchers began to delve into cognitive science and development (Feldman, 1982; Gardner, 1985; Sternberg, 1985), and emphasis was directed to improving curriculum for gifted students through thinking skills. The phrase *higher level thinking* became the hallmark of gifted programs, and moving students into the more advanced skills such as those of Bloom's taxonomy (1956) was the goal. Students were to do less work at the knowledge and comprehension levels, and more at the application, analysis, synthesis, and evaluation levels. Although it was developed for the purpose of classifying teaching objectives and student outcomes, the taxonomy quickly became the basis for gifted programming (Feldhusen, 1994). Leaders in the field of gifted education identified the principles of instruction as including more complex and abstract concept/theme/issues-based curriculum, in-depth investigations, problem solving, decision making, and reflection and understanding of self and the learning process (Clark, 1983; Feldhusen, 1989; Maker, 1982; VanTassel-Baska, 1988). These necessitated more integrative and productive kinds of thinking. Although there is a dearth of research specifying the benefits of thinking skills instruction for gifted students (Shore, Cornell, Robinson, & Ward, 1991; Shore & Kanevsky, 1993), the recommendations for higher level thinking skills were and are still present in virtually every source of curriculum for talented learners.

With the present-day focus in education on standards in all disciplines, the place of higher level thought processes takes on renewed importance. Many of the standards focus on increasing higher order skills for all students. VanTassel-Baska (2003) cautioned educators of the gifted to look carefully at the standards, seeing how broad and deep they are and conscientiously planning for how they will be met by able learners.

Curriculum for Thinking

Believing that thinking can be developed and strengthened, and understanding that advanced level of ability in thinking skills requires high-level instruction, teachers of gifted students choose and create curricula that provide complexity and deep-thinking opportunities. Endorsed instruction for

students prescribes infusion of the following broad categories of thinking into daily teaching:

- critical thinking (Ennis, 1985; Winocur & Maurer, 1997);
- creative thinking (Pyryt, 1999; Rostan & Goertz, 1999);
- problem finding (Starko, 1999) and problem solving (Isaksen & Treffinger, 1985);
- metacognition (Swartz & Perkins, 1990);
- domain-specific patterns and forward reasoning (VanTassel-Baska, 1992);
- correlational reasoning (Ross & Smyth, 1995);
- reflective inquiry (Shermis, 1992);
- questioning created for memory, divergence, convergence, aesthetics, and ethics (Thompson, 1996);
- inquiry and investigation (VanTassel-Baska, 2003);
- dialectical thinking skills (Paul, 1990); and
- Socratic discussion (Paul; Thompson, 1996).

Coleman and Cross (2005) wrote that the

> overwhelming majority of teaching methods reported in the literature on gifted education are variations on creativity and problem-solving themes. Their major characteristics involve suspension of judgment, practice in generating responses, and opportunities for children to consider how they think (metacognition). (p. 400)

Evaluating complex thinking processes allows teachers to see how students understand and define problems and how they organize and interpret information. This is not a simple task, and it is one that awaits research and credible instruments (McDaniel, 1994). Different disciplines require different kinds of thinking, and the thinker's level of expertise and maturity complicate the process of understanding children's thinking (Feldhusen, 1998). Teachers who instruct students in these pervasive thinking skills must be able to model their use, as well as convey knowledge about them and measure student responses. Teachers must have appropriate training to understand how children think, and then be taught how to use that wisdom as they plan for their students' learning experiences (Hansen & Feldhusen, 1994; McDaniel; Shore & Kanevsky, 1993).

Because of the complexity of thinking, none of the programs available to teachers is, in and of itself, a complete thinking course for talented learners. It is tempting to purchase one of the hundreds of kits or books of ideas that are advertised to teachers as the formula for teaching thinking skills. The dangers range from reliance on a too-narrow set of thinking skills, to an indefensible stream of disconnected activities that have no longevity for students to use outside of the activity. A balanced approach to thinking instruction includes: (a) thinking and content learned together (thinking does not need to wait until the child has acquired a large base of knowledge about a field); (b) learning about thinking as

the students are learning to do thinking ("learning about" teaches metacognitive skills, and "learning to do" teaches the ways of organizing thinking and provides practice); (c) giving students opportunities to become more and more autonomous (teacher introduction, small group work, solo activities); and (d) providing attention to transfer (deliberate awareness and teacher modeling of using strategies in varied contexts; O'Tuel & Bullard 1993; Swartz & Perkins, 1990).

Swartz and Perkins (1990) also recommended three planning methods for teaching thinking: (a) direct instruction of a particular strategy in a noncurricular context; (b) use of a strategy that promotes thinking in a curricular context; and (c) infusion, or restructuring traditional content-area lessons for direct instruction in specific thinking skills. They believed that infusion is the preferable mode, because it helps students develop and integrate effective thinking into both their academic and nonacademic lives. Good thinking development and use of thinking skills cut across all grade levels from kindergarten to graduate school, as well as across all subject areas of instruction. This allows many opportunities for meshing thinking skills materials and programs with the classroom content. Teaching thinking according to a well-articulated, comprehensive plan and effective pedagogical techniques maximizes the students' incorporation of the skills—and habit—into all of their thinking (Renzulli, 1994; VanTassel-Baska, 2003).

Shore and Kanevsky (1993) pointed out the difficulty of "researching" thinking programs and practices for the gifted: The field needs classroom research instead of clinical research. Students and teachers must be observed over time and in varying school and out-of-school settings to discover what is effective. Because of the complexity of the thinking process and the variables that impact the process, short-term studies are not reliable venues for policy statements about what is best for gifted students.

WHAT WE CAN DO

Using what is known from research and practical experience, educators and parents can make a difference in the development of gifted children's thinking skills.

At Home

- Adults must model reflective behavior for children. "Think-aloud" modeling that allows children to witness adults' commitment to the processes of good reasoning is powerful, especially when it is done in the home and at school.
- A climate of acceptance and respect of children's thinking that opens the possibilities of discussion and idea exploration will show children that thinking is valued.

In the Classroom

- Emphasis in classrooms, with the support of the school administration, should be on rewarding thinking, inquiry, reflection, and the consideration of alternatives in lieu of memorization, drill, reliance on lower level recall, and tight control of content and class work.
- Thinking skills should be taught within a context that is substantial and motivating for students. Teach for transfer to all thinking by the infusion method, across grades and subjects. Do not leave the learning of these skills to chance.
- Students' thinking should be expanded into more complex, higher level mental operations and reasoning by using questions, problems, and conceptual issues. Help students build a strong knowledge and conceptual base from which to develop relationships and connections (VanTassel-Baska, 1998).
- Teachers should become aware of their interaction patterns with students, and seek ways to respond more reflectively and less judgmentally. This requires listening and watching themselves teach (through audio- and videotaping), using self-assessment tools such as a checklist to analyze their teaching (looking for responses that limit or inhibit thinking and those that encourage thinking), and training in the areas as needed.

At School

- Evaluation methods, especially standardized tests, that tap students' ability to think well and productively should be developed. These new instruments for evaluating growth in students' thinking must be integrated into teacher preparation. Rubrics, process measurement, and tests that require students to construct answers rather than recognize them, as well as conduct long-term observations, will provide more information about children's thinking skills.
- Preservice and in-service teachers should have professional preparation in the differences in gifted students' thinking patterns and in defensible, appropriate curriculum differentiation designed to meet those students' needs. Rather than just talking to students about thinking, teachers must actively engage students in thinking in areas such as the writing process, scientific experimentation, reading comprehension and analysis, computation, and study skills.

Practical experience teaches that thinking skills that result in the creation of ideas and intelligent problem solving help gifted students develop their unique abilities. Yet, schools graduate young people who are experts at memorizing and recalling factual information, but who lack proficiency in using that information to make informed judgments. They drive for certainty, are uncomfortable with new problems, and have a need to know the "right answers" from their teachers. Textbooks and classroom resource materials are slow to change.

Teachers must use what they learn about their gifted students from reflective teaching to build a solid, defensible thinking skills curriculum and the climate needed in which to teach it.

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