The Nature and Nurture Of the Self-Directed Learner

Andrew Biemiller and Donald Meichenbaum

By observing how children approach tasks, giving them appropriate tasks, and resisting the urge to “think for” less self-directed learners, teachers can help each individual attain mastery and expertise.

Seven-year-old Rita talks to herself regularly, but it's not just chatter. Engaged in a painting project, she thinks out loud and encourages herself with such statements as, “I know what I'll do. I’ll mix this white and the red and get pink.” When the color is still not to her liking, she tells herself, “That’s OK. I'll just add some more white.”

Rita can be called a self-regulated learner. Her confidence leads her to increasing competence at all kinds of tasks.

Research conducted in the last 10 years suggests that one source of the differences between the highest- and lowest-achieving children is the degree to which they become self-regulators of their own learning. High-achieving students engage in a number of helpful strategic skills, including goal setting, planning, self-interrogating, self-monitoring (checking answers), asking for help, using aids, and using memory strategies (Pressley et al. 1990, Zimmerman and Shunk 1989, Meichenbaum 1984). In addition, more competent students bring a greater knowledge to school tasks. Self-regulated learners behave in ways that often characterize adult experts (Bereiter and Scardamalia 1986). Their “budding expertise” is evident in the complexity of their skills; the amount and structure of their knowledge; the strategic nature of their behavior; and the motivated effort they make, especially in response to failure (Dweck 1986).

How do such differences in academic expertise develop? Moreover, how do these differences in self-regulation express themselves in classroom activities? And what can be done to help children who are less likely to engage in such self-regulationary behaviors to begin to do so? These are the questions we have tried to answer during the past three years as we developed and tested ways of observing self-regulation and expertise as they occur naturally in classrooms.

Observing Expertise in Elementary Classrooms

In 1989, we asked 15 teachers in grades 1-6 to nominate their most “self-directed” students (those who “know what to do and do it without having to be told”). Over the course of our study (see p.78), we observed more than 70 of these children, as well as 70 of their low-self-directed counterparts. Literally, we put ourselves in these children’s “back pockets.”

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recording everything they did; what they said to themselves, to their peers, to their teacher; and in turn, what their peers and teachers said to them. As a result of this preliminary work, we developed a sensitive and reliable coding system for the children's discourse about tasks.

We discovered that what children say about their work to others and to themselves can help us to infer the nature of their cognitive and metacognitive self-regulatory activities. The children's task-related speech, whether directed to others or to themselves, provides a "window" on their cognitive processes. As Piaget (1964) observed, in the process of relaying thoughts to others, we also relay them to ourselves. For instance, while in a conversation with teachers, the self-directed children often answered their own questions—"It's OK, I know what to do now." In the process of formulating thoughts into communicative acts, thoughts become the object of reflection.

**A Transactional View of Expertise**

Our analysis of children's task-directive speech and the contexts in which it occurs has led us to develop a transactional view of the development of expertise. While the range of achievement is great, the range of academic demands placed upon children is not as varied. For example, fractions are generally introduced in the 3rd grade, ready or not. Children whose level of cognitive development exceeds the complexity of tasks they are being taught have "surplus mental capacity" permitting them to "think" (self-dialogue) about what they are doing. Cognitive advanced children acquire new skills from a position of strength—they have the needed cognitive capacity, plus prerequisite skills, to learn the basics of new skills relatively easily.

These "elementary experts" apply their surplus capacity to think about what they are doing while consolidating skills during independent work periods. As they work, they talk to themselves and others about the task and associated skills. As a result of these dialogues, they come to understand the task, and to be able to call upon the associated skills (in a literal, verbal sense) when new situations occur in which the skills are relevant.

This tendency to think about what they are doing is rehearsed and reinforced by teachers and peers. Teachers and peers are more likely to ask these advanced elementary experts to verbally review tasks and to help others. Advanced children also do these things spontaneously.

When less cognitively advanced children are given the same task, they approach it with less well-established prerequisite skills. The sequence of steps to be considered in the new task creates "overload," or at least occupies the student's full attention. Little or no capacity is left for verbal thought processes while conducting the task. In short, the less self-directed children are less likely to do the task and think about it at the same time. As these children try to consolidate the task through practice, they may go through the motions, carrying out some or all of the steps of the task. However, they are less likely to carry on a dialogue with themselves or others about the task (think about it). If they do initiate talk to others about the task, it is more likely to be in the form of a question about how to do the task or a spontaneous comment about their own lack of ability ("I can't do this!"). In this case, they are thinking...
about the task but not doing it! Thus, while children who are rich in self-regulatory skills get richer, others get poorer.

**Using Teachers as Crutches**
Teachers and more advanced peers sometimes “think for” less self-directed children. We suggest that teachers and peers act as “mental crutches” for these children by doing defining, planning, and monitoring activities for them. This is a self-maintaining cycle. As less self-directed children become expert at gaining assistance, they continue to be in need of help rather than learn to regulate their own tasks. Others continue to help them, and thus the cycle continues.

While less advanced children may in time master the steps of the task, they are infrequently put in the position of talking about it to others. By the time they have mastered the task, the teacher has moved on to new, more complex tasks. As a result, less self-directed children are not often asked to review the task verbally. Others rarely turn to them for assistance. Consequently, less advanced children make less use of language to plan and monitor tasks. Development of elementary expertise reflects a fit between the demands of the task and the ability of the child that allows for the development of self-directed social and self-discourse.

**What Teachers Can Do**
To help low achievers, teachers should strive to systematically monitor their students’ social and self-discourse in order to infer the children’s level of knowledge, strategies, and motivation. How children monitor their own performance and that of others, how they convey plans, and how they respond to failure—each provides important clues to the level of their competence and expertise. Teachers need to become more astute observers of, and listeners to, their students’ spontaneous task-directive speech.

Second, teachers could also become more aware of the effects of their interaction with students. Since those students who are more expert have the ability to nurture their own self-regulatory skills, teachers may unintentionally strengthen the more expert children’s skills at the expense of the less competent students. Out of a desire to help, they provide planning and monitoring information. Thus, they may not provide the less competent child with the same opportunities or tasks to practice to develop his or her self-regulatory competence.

The level of task difficulty or task complexity also influences this transactional pattern. Thus, an important implication of our work is that expertise is not a function of the child’s ability alone; rather, it is a joint product of the student’s ability (knowledge, strategies, motivation) and the level of task difficulty. In order to build students’ self-regulatory skills, teachers must present them with tasks that just exceed their current level of expertise. When tasks are too easy or too difficult, the students have minimal opportunity or motivation to practice and consolidate their self-regulatory skills.

An analogy illustrates this important point. When someone learning to ski is taken to either the easiest or the most difficult slope, he or she will have little opportunity to employ self-regulatory skills (planning, monitoring, elaboration). Either boredom or fear may interfere with the use of self-regulatory activities. The ski slope that is optimum for the development of the student’s skiing expertise is just beyond the student’s current level of competence. The classroom teacher needs to be a careful and astute engineer of classroom tasks, varying and matching tasks to each child’s competence level. In the same way that the expert ski instructor would alter the nature of assignments, instructions, and supports to suit the novice skier’s abilities, the classroom teacher should alter task demands, instruction, and assistance to each child’s level of skill.

The challenge for the teacher is further complicated because students vary in the areas in which they have expertise. Our observations indicate that some children who use self-regulatory language in one subject (art) do not show a similar pattern in another (math). We suspect that these differences reflect different degrees of fit between children’s abilities and task demands. Most children have the capacity to use metacognitive behavior and demonstrate expertise when provided with the right settings and tasks.

Another implication of our work is that teachers can use a broad array of instructional techniques to nurture elementary expertise. These include teacher think-alouds, labeling of student metacognitive behavior, explicit cognitive instruction with feedback and evaluative discussions, reciprocal teaching, scaffolding, and...
Listening In on Self-Directed Learners

To study the development of expertise in the classroom, we observed 70 1st-6th grade students nominated by their teachers as "most self-directed" and 70 nominated as "low self-directed." Our observation system focused on children's statements and questions to peers, teachers, and selves, while a narrative account of each child's behavior provided the background for interpreting what was said. An observer who followed the child about the classroom recorded everything the child said, along with accompanying behaviors.

Each sentence was coded for dialogue features, task functions, and emotional tone. The dialogue features describe the social context in which the sentence occurred. The task functions describe the metacognitive or task- regulatory function of each sentence. (Dialogue features and task functions are illustrated in fig. 1.) Finally, in order to tap the emotions that accompany performance, each verbal unit was coded for emotional tone (positive, neutral, or negative). We did not code instances of social talk concerning non-task-related events (such as, "Do you know how the Toronto Blue Jays did last night?") and "verbal products" (reading, counting, or spelling aloud). Thus, only task-directive language was coded.

Each sentence the child uttered was coded for five dialogue features, for a specific task function, and for emotional tone. (We coded language directed to the child in the same way.) The promise of the coding system in explicating the nature of self-regulatory behavior is evident from a preliminary analysis of observations of 14 "highly self-directed" and 14 "less self-directed" children as nominated by their teachers in several different schools (grade 1 to grade 6). A second study concerned repeated observations of two highly self-directed and two less self-directed children in a 3rd grade. Major findings from these studies included the following:

**Attending to Mastery**
Our position is consistent with the observations offered by John Carroll (1989), who argued that attempting to achieve equal outcomes for all children at the same time is educationally counterproductive if we want maximum possible outcomes for each child. Teachers should be more concerned about achieving reasonable levels of independent mastery of what each child can do, as opposed to being concerned with covering an arbitrarily established curriculum. This proposal is not new; it is just not done very often.
Highly self-directed children spontaneously initiated more than twice as many statements about tasks per hour (22) as the less self-directed children (11).

Most of the higher rate of the self-directed children’s spontaneous statements about tasks was accounted for by planning (what next), conditional planning (if, then; choosing between alternative plans), and monitoring (checking own or other’s progress) statements. Both groups had similar rates of defining and evaluating statements. We suggest that spontaneous planning and monitoring statements are crucial indicators of the degree to which a child is functioning with expertise in a specific situation.

When expressing emotion about their own tasks, the highly self-directed children were mostly positive, while the less self-directed children’s emotions were about half negative.

While both groups asked similar numbers of questions, highly self-directed children questioned peers about half the time, while the less self-directed children mostly asked questions of teachers.

Data from our second study indicate that less self-directed children received an average of 17 task-directive sentences per hour from their teacher. In contrast, the highly self-directed children received an average of just two sentences per hour from their teacher. This suggests that teachers and peers often “think for” less self-directed children.

Teacher language directed toward the less self-directed children shows that the teacher is planning, monitoring, and the like for the children (see fig. 2). These children elicit more task-directive support from their teacher than from themselves.

In contrast, highly self-directed children received many opportunities to nurture and practice their metacognitive skills. They were often asked by teachers to help other children and were also asked to share procedural information with the class. Thus, highly self-directed children seem to create a learning environment in which they can develop their self-regulatory skills.

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If we could attend more carefully to mastery and expertise and less to grade level curriculum and norms, the level of effective school skills would rise noticeably. We would wind up with a substantially larger group of literate and numerate graduates. Students might be exposed to fewer subjects but would be truly able to use what skills they have for purposes they value.


This analysis follows from Case’s (1985) model of intellectual development, Fischer and Pipp’s (1984) analysis of the interaction of intellectual development and skill acquisition, and Vygotsky’s (1978).
discussion of the implications of the "zone of proximal development" for education.

"We conceive of tasks roughly as lists of steps to be carried out to achieve a goal. "Capacity" refers to the number of steps that can be successfully coordinated (Case 1985).

References

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