Practical Intelligence for Success in School

Students can be taught to meet the implicit expectations of their teachers—they don’t have to rely on osmosis.

We knew the change had begun when we heard about “Carla” [all names of students in this paper are fictional]. During the first semester, Carla had been either late to the new Practical Intelligence class or not there at all. By the second week of the second semester, she had started to wander into class just before the bell rang. Although she hung back a little from the rest of the group, she was attentive and soon began to participate in her own way.

Carla had started the gradual process of dropping out (Bonikowske 1987) by 7th grade. Year after year, her performance suffered as she made the same mistakes, over and over again. Her teachers had not neglected her, but they were working under the assumption that she had learned what school expected of her; she had not. They saw their role as primarily one of teaching subject-matter in a variety of disciplines. They believed that she was either rebelling or not trying. But Carla had simply never learned what we call the tacit knowledge of school.

Unspoken Expectations
Teachers have a wide array of expectations for students, many of which are never explicitly verbalized. Students who cannot meet these implicit expectations may suffer through year after year of poor school performance without knowing quite what is wrong.

The concept of tacit knowledge was introduced by Polanyi (1946, 1966). Later, Sternberg (1985) and Wagner and Sternberg (1986) used it to describe knowledge that is not explicitly taught or even verbalized, but is necessary for an individual to thrive in an environment. The concept applies in a variety of settings. For example, level of tacit knowledge is an excellent predictor of performance in management (Wagner and Sternberg 1985, 1986). It is also crucial for successful performance in school. Indeed, our research indicates that it is as good a predictor of college success as are academic...
types of tests (Sternberg and Wagner 1989). Of course we should teach students the skills they will need for life outside the school, but too often we forget the point of Dewey’s quote at the beginning of this article—life in school is not just preparation for life; it is life. Students must learn how to use their intelligence effectively in school because that’s where so much of their lives take place.

Our program—the Yale Practical-Intelligence-for-School (PIFS) curriculum—was developed to help students like Carla learn the vital tacit knowledge they need to succeed in school. This paper details the development of the PIFS curriculum, explains our teacher training procedures and lesson designs, and reports on our field-test and evaluation of the program at a middle school in a middle-class suburb of Connecticut.

Practical Intelligence
Since 1987, our Yale University team of investigators and Howard Gardner’s Harvard University researchers have engaged in a joint effort to develop the theory-based curriculum, practical intelligence for school. The program is an outgrowth of a merger between two theories of human intelligence: Howard Gardner’s (1983) theory of multiple intelligences and Robert J. Sternberg’s (1985, 1989b) triarchic theory of human intelligence. The way we have combined the theories is illustrated in Figure 1. Gardner’s theory expresses the domains in which intelligence manifests itself: linguistic, logical-mathematical, musical, spatial, bodily-kinesthetic, interpersonal, and intrapersonal. Within Sternberg’s triarchic theory, the componential subtheory identifies the mental processes that are exercised in these domains; the contextual subtheory defines the practical, “relevant-to-life” ways in which the processes are applied; and the experiential subtheory deals with the transfer of skills to new situations. Note that in Figure 1, under the contextual subtheory, the practical applications include both in-school and out-of-school problems.

Our Yale and Harvard research teams came up with a total Practical Intelligence curriculum which includes two parts:
- The Yale portion of the curriculum, designed to teach skills used across content areas. This is taught by content teachers separately for two to three periods per week, ideally for a period of a year.
- The Harvard portion of the curriculum, which emphasizes individual subject-matter infusion of skills within the content class.

The two teams work together. They generate ideas and provide feedback as the curriculum is developed. This report focuses on the Yale portion of the curriculum.

The Curriculum
The organization of the Yale Practical-Intelligence-for-School (PIFS) curriculum is based upon the three kinds of tacit knowledge that Wagner and Sternberg (1985) have found critical to adaptation to any environment: managing oneself, managing tasks, and working with (managing) others (see fig. 2). The curriculum consists of both a student text and a comprehensive teacher’s manual that describes in

<table>
<thead>
<tr>
<th>Intellectual Domains (Multiple Intelligences)</th>
<th>Examples of Mental Processes</th>
<th>Practical Application:</th>
<th>Transfer to New Situations:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linguistic</td>
<td>Selecting the steps needed to solve a problem.</td>
<td>How to organize your thoughts in order to write a book report.</td>
<td>Writing a history report. Writing a letter. Giving directions to someone.</td>
</tr>
<tr>
<td>Logical-Mathematical</td>
<td>Ordering the components of problem solving.</td>
<td>How to complete a math worksheet accurately.</td>
<td>Figuring out the steps for balancing a budget.</td>
</tr>
<tr>
<td>Musical</td>
<td>Selecting relevant information.</td>
<td>How to pick out the melody from the harmony.</td>
<td>Recognizing the main theme in a musical work.</td>
</tr>
<tr>
<td>Spatial</td>
<td>Selecting a mental representation for information.</td>
<td>How to make pictures in your mind to help you remember what you read.</td>
<td>Using a schematic to assemble a piece of electronic equipment. Reading a map.</td>
</tr>
<tr>
<td>Bodily-Kinesthetic</td>
<td>Allocating your resources.</td>
<td>How to pace yourself throughout a long-distance run.</td>
<td>Adjusting your physical exertion during a basketball game or ballet performance.</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Solution monitoring.</td>
<td>How to understand your teacher’s comments on your history report.</td>
<td>Restating what someone is telling you to be sure you understand him or her.</td>
</tr>
<tr>
<td>Intrapersonal</td>
<td>Identifying a problem.</td>
<td>Figuring out that something bothers you in school.</td>
<td>Figuring out that you are getting annoyed by your brother’s teasing.</td>
</tr>
</tbody>
</table>
The course opens with instruction on how students can manage themselves. The first units, on self-management, provide an overview of students' multiple intelligences. The teacher and the students discuss styles of thinking (see Sternberg 1988a, 1990) and how students can best exploit their own individual styles. This unit on self-management also deals with crucial aspects of adaptation to school, such as taking in new information, showing what you have learned, using what you know, and implementing what you have learned.

The second part of the course—managing tasks—deals with topics such as getting organized, setting up strategies for problem solving, breaking bad habits, seeking help with problems, and thinking about time management. This part of the course also deals with understanding questions, following directions, and taking tests.

The third part of the course—cooperating with others—presents such topics as how to handle yourself in class discussions, knowing what to say when, putting yourself in others' place, and solving communication problems. It also involves learning how to take a longer-term perspective in dealing with other people.

**Lesson Designs**

The lesson designs in the teacher's guide follow a format based on the four-prong model of Sternberg and Davidson (1989). This model draws upon Vygotsky's (1978) idea that learning is most effective when it occurs first in a social context and is only internalized later.

The teacher is provided with lesson sections that describe the global purpose of the lesson and give the underlying theory or rationale for teaching it. The objectives and time planner help the teacher become quickly aware of the specific skills to be taught and the timing of the lesson. Information concerning prerequisite skills, an estimate of the amount of time needed for the lesson, and necessary materials facilitate preparation.

The teacher starts out by giving students an orientation to the concept being taught. First, the teacher taps the students' prior knowledge, which gives the teacher an opportunity to correct incorrect information and a chance to see the way students have learned to think about the topic. The teacher presents new information—lecture, discussion, questionnaires, and the text.

Students then meet in small groups to try to apply their new knowledge and skills. This part of the lesson includes games, activities, and work...
Rather than merely hope that students have learned school survival skills in their previous grades, we can directly teach these skills to all students.

Tacit Knowledge Is Teachable

The usually unspoken knowledge that is crucial to practical intelligence for schools is teachable. Rather than merely hope that students have learned school survival skills in their previous grades, we can directly teach these skills to all students.

But teaching practical intelligence for schools is anything but easy. For many teachers, successfully teaching it requires a fundamental reorientation of attitudes and teaching style. In particular, teachers need to come to value a kind of knowledge that they usually do not teach, despite expecting students somehow to learn it. And they must realize that this practical knowledge will be learned by students only if it is, well, practical. Students must see how to apply it in their daily school lives—we would not want students to acquire this knowledge in an isolated, encapsulated form that is not useful to them. We all want children to succeed in school; teaching practical intelligence for school can foster that success.

Finally, it's important to find out what the students thought of the class. After a lesson on memory, Bill said, "I'm bad at math. I always thought I would be bad at math even if I tried. I hate it so I just rush through it. Now I take my time with it. If I take my time to study it, I understand it better."

Nadia spoke up during a lesson on self-management. "This year I had trouble in social studies. I was too shy to ask the teacher. Then I got a D, so I asked the teacher for help when I..."
didn't understand. The next time I got an A in social studies."

Jim reported, "In social studies I changed the way I was studying. I went through every single chapter and tried to think of the main idea. I went from 60s to 80s in that class."

Jim said, "I didn't really think I could reach level 4 on the computer game. Now I'm top score. Now I believe I can improve by working hard."

The course also seemed to have a positive effect on students' attitudes toward others. One gifted student remarked, "Before, I thought that intelligence—practical and academic—was all one thing. I didn't realize it had different parts. It will help me recognize that someone might not be able to read but may be really smart in being able to repair a car. I used to think that other people were dumb. Now I think that they can be more intelligent than me in other categories. Before, I might have said to myself (not out loud, but in my head), 'You're so stupid.' Now I won't think of them as dumb anymore."

And Carla? She's still in school, in mind as well as in body, and doing just fine, thanks.

References


Authors' note: Preparation of this article was supported by a grant from the McCallum Foundation. We are grateful to Howard Gardner and his research group at Harvard for their collaboration in all phases of the PIFS Project. Alice S. Jackson was the primary liaison with the school in all aspects of this study. We thank Lenora Manzella, Sandra Wright, and Elizabeth Neuse for their assistance in the preparation of this report. Requests for reprints or information about the Yale portion of the PIFS program should be sent to Robert J. Sternberg at the address below.

Robert J. Sternberg is IBM Professor of Psychology and Education. Lynn Okagaki is Associate Research Scientist, and Alice S. Jackson is Associate in Research II, Yale University, Department of Psychology, P.O. Box 11A, Yale Station, New Haven, CT 06520-7447.