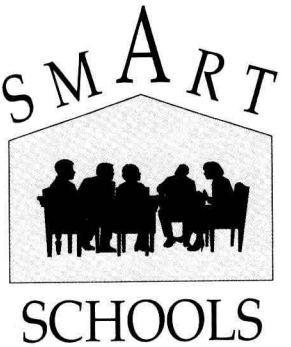
SMART SCHOOLS

From Training Memories to Educating Minds

David Perkins



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To my schoolchildren:
Ted, Alice, and Tom

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SMART SCHOOLS

The Hanging Gardens of Babylon counted as one of the seven wonders of the ancient world, alongside the Colossus of Rhodes, the pyramids of Egypt, and the Temple of Artemis at Ephesus. Word comes down to us of a terraced wonderland of fountains, trees, and flowers, rising up from the banks of the Euphrates. King Nebuchadnezzar II constructed this sumptuous adjunct to the royal palace more than half a millennium before the birth of Christ.

Of these ancient wonders only the pyramids remain. Today great physical constructions play second fiddle to the wonders of everyday life—for instance, the transistor, which packs little boxes with great powers of voice, image, and computation; or, more humble yet, the light bulb. How hard it is to imagine life without light available at the flick of a forefinger!

And another invention: schools. Yes, schools. A wonder, really. A very new thing, if we mean public schools, schools for everyone, schools as part of a massive committed mission to bring to virtually all of a population with its multifarious ambitions, misgivings, talents, and quirks basic knowledge,

skills, and insights. Schools are wonders in the same way that light bulbs are—too much a part of everyday life to amaze us, but, from a historical perspective, quite novel and exotic in their ambitions and accomplishments.

Not, it must be said, that schools always seem to function in as wondrous a way as we would like. Not that we are so happy with how schools work and what they achieve. Not that society gives over to schools and teachers the resources and the honors they deserve. But with all that, still a wonder indeed. Gripe how we will about what schools are *not* doing these days, they are already doing things undreamt of a couple of centuries ago, much less in Nebuchadnezzar's day.

USING WHAT WE KNOW

Dreams are where the dilemma starts. Although schools already achieve things undreamt of earlier, we have more ambitious dreams today. We want schools to deliver a great deal of knowledge and understanding to a great many people of greatly differing talents with a great range of interests and a great variety of cultural and family backgrounds. Quite a challenge—and why aren't we doing better at it?

Some say, "We don't know enough. We don't know how learning really works. We don't know how teachers really think about their craft. We don't know how to cope with cultural diversity. We don't know how schools can work better as institutions. We just don't know enough."

I think they're wrong. Of course, we want to know and understand more about all those things. But we know enough now to do a much better job of education. We know because we have made an effort to find out. Over the past quarter century, psychologists have come to understand more deeply how learning works and how to motivate learning. Sociologists have studied how classrooms and schools as institutions work, what makes them resistant to change, and how to foster change. Innovations in various educational settings around the world allow us to compare experiences across contexts and cultures. We know a lot about how to educate well. In the later chapters of this book, I'll do my best to prove this.

The problem comes down to this: We are not putting to work what we know. In the school down the street, in the school across the river, students are learning and teachers are teaching in much the same way they did twenty or even fifty years ago. In the age of CDs and VCRs, communications satellites and laptop computers, education remains by and large a traditional craft.

Of course, the educational landscape sparkles with isolated innovative programs. Some individual teachers are ardent experimenters, trying worthwhile things. Some initiatives score important successes here and there. But most are limited. Most do not put to work in any full and rounded way what we know about teaching and learning. We do not have a knowledge gap—we have a monumental *use-of-knowledge* gap.

To close this gap, we need schools that put to work, day in and day out, what we know about how to educate well. We can call such schools "smart schools"—schools wide awake to the opportunities of better teaching and learning. We can think of smart schools as exhibiting three characteristics:

Informed. Administrators, teachers, and indeed students in the smart school know a lot about human thinking and learning and how it works best. And they know a lot about school structure and collaboration and how that works best.

Energetic. The smart school requires spirit as much as information. In the smart school, measures are taken to cultivate positive energy in the structure of the school, the style of administration, and the treatment of teachers and students.

Thoughtful. Smart schools are thoughtful places, in the double sense of caring and mindful. First of all, people are sensitive to one another's needs and treat others thoughtfully. Second, both the teaching/learning process and school decision-making processes are *thinking centered.* As we shall soon see, putting thinking at the center of all that happens is crucial.

Informed, energetic, and thoughtful—three broad characteristics for the smart school. These characteristics are not revolutionary. They are common sense by and large. But they are not common practice. In most schools, faculty and students are not well informed about how teaching, learning, thinking, collaboration, and other such elements of schooling work best. In all too many schools, energy levels are low; students, teachers,

and administrators fight a thousand frustrations. And most schools do not put thinking at the center of the learning process or at the center of working together with one another.

In this book, I want to describe in broad stroke the contemporary science of teaching and learning that can inform teachers, students, and administrators about how learning works best. I want to touch on factors that create positive energy in a school setting. And I want to focus particularly on the role of *thoughtfulness* in the teaching/learning process, the key to genuine learning that serves students well. My hope is that this book, along with other publications and events, will help communities everywhere to work toward smart schools.

The goals of education are a good place to start.

GOALS: TOWARD GENERATIVE KNOWLEDGE

What do we want of education? This is the key question for the entire enterprise. Unless we know what we want and pursue it with ingenuity and commitment, we are not very likely to get it.

Of course, in a broad sense, we know all too well what we want. It can be put in a single word: *everything.* In *Popular Education and Its Discontents,* Lawrence Cremin, late historian of education at Columbia University, especially emphasized how we bedevil education with agendas. We try to solve all our problems by assigning them to educators—not only knowledge but citizenship, moral rectitude, comfortable social relations, a more able work force, and so on.*

It is easy to like the sound of all of these goals. Most of us would be happy to see public education working away at them insofar as it can. But we should also wonder whether the educational enterprise has a core.

One reason to worry about a core is that the "everything" agenda for schools is an energy vampire. It drains teachers, students, and administrators. Think how crucial an energetic spirit is to any institution you want to thrive. Nothing drains energy more than having too many things to do and too little

*For the sake of flow, citations for ideas and sources mentioned in the text appear in the Notes organized by chapter and section at the end of the book. The full references appear in the References section that follows the Notes.

time to do any of them anywhere near well. I certainly am not saying that schools should focus very narrowly on reading, 'riting, and 'rithmetic, for example. But I am saying, in common voice with many others these days, that some focus is imperative.

So even though we want everything, what do we want *most?* Without apology, let me attempt an answer. Here at a minimum is what we want, three general goals that stick close to the narrower endeavor of education. These are goals almost no one would argue with:

- Retention of knowledge
- Understanding of knowledge
- Active use of knowledge

A summary phrase for the goals taken together might be "generative knowledge"—knowledge that does not just sit there but functions richly in people's lives to help them understand and deal with the world.

No futuristic agenda this! These goals are not meant to sound exotic. They do not reach for anything very new. They follow directly from the core function of education, passing knowledge from one generation to the next. Whatever else a school is doing, if a school is not serving these goals well, it hardly deserves the name of school.

Lest these goals sound altogether too narrow, let me emphasize how broadly I mean "knowledge." While the term sounds somewhat circumscribed, the English language seems to offer no perfect word to cover the many kinds of learning. So let it be knowledge, emphasizing that this includes factual knowledge, skills, know-how, reflectiveness, familiarity with puzzlements as well as solutions, good questions to ask as well as good answers to give, and so on. As to its content, think in terms of typical subject matters, if you like—reading, writing, mathematics, science, history, and so on. They will do for the present.

We need to pursue every one of these three goals to achieve generative knowledge—knowledge that serves people well in later academic and nonacademic pursuits, knowledge that empowers the new generation to build even further.

Take, for example, goal number one, retention. Having knowledge for the Friday quiz does learners little good unless they still

have it when they need it months or years later. Or take goal number two, understanding. There is little point in having knowledge that is not understood. Of course, not everything has to be understood completely. But, for example, if you do not understand when to use the arithmetic or algebra you know, it cannot do you much good. If you do not understand why history unfolds as it does, you will be ill equipped to grasp current events, vote wisely, or steer your own life with an eye on historical forces.

As to active use, the third goal, there is little gain in simply having knowledge and even understanding it for the quiz if that same knowledge does not get put to work on more worldly occasions: puzzling over a public issue, shopping in the supermarket, deciding for whom to vote, understanding why political turmoil persists at home and abroad, dealing with an on-the-job human-relations problem, and so on.

Retention, understanding, and the active use of knowledge . . . three goals of education hardly anyone can argue with. Of course, one can have other sets of fundamental hard-to-argue-with goals for education besides these. In his 1982 book *The Paideia Proposal: An Educational Manifesto,* Mortimer Adler advocates the trio of (1) the acquisition of organized knowledge; (2) development of intellectual skills; (3) enlarged understanding of ideas and values. I like Adler's goals. Retention, understanding, and the active use of knowledge include them, when we remember that knowledge has a broad interpretation that includes skills.

However, I like my terms better, because they describe not only what the learner gets but what the learner is supposed to be able to do with it afterwards. In particular, retention and active use point toward action. Not stopping at acquisition, they declare that the learner can go on to do things. Understanding too points toward action. As we shall see in chapter 4, understanding involves what we will call "understanding performances."

MEANS: THOUGHTFUL LEARNING

They seem innocuous, the three goals proposed here. They do not ask for any more than what we have always been asking for. They do not sound like much of a wake-up call for schools.

But I will let you in on a secret: These goals by themselves are enough to lead us to an ambitious vision of smart schools. Simple and agreeable though they are, they demand a great deal of schooling. Contemporary educational practice in the United States and in many other settings comes nowhere near achieving reasonable versions of these goals.

Nowadays, students emerge from primary, secondary, and even college education with remarkable gaps in basic background knowledge about the world they live in. A case in point: Most seventeen-year-olds cannot identify the date of the U.S. Civil War within half a century. In addition, students do not understand much of what they are taught. After education that directly treats important and accessible principles of physics, biology, and mathematics, many people persist in fundamental misconceptions about the world around them. And further, people do not use what they know. At home or in business, people fail to muster basics of writing, reading, and relating to others that have been prominent in their educational experiences. Chapter 2 says much more about all this.

The bottom line is that we are not getting the retention, understanding, and active use of knowledge that we want. If what we are doing is not working, what do we do instead? What do these shortfalls argue for?

The research and experience of educators, psychologists, and sociologists over a number of years offer a clear answer, the harvest of what might be called an emerging new science of teaching and learning. It is not a completely original answer. Many thoughtful people from Socrates on have expressed the same spirit. But the contemporary understanding of human thinking and learning has buttressed their insights with an array of careful evidence that makes the conclusion difficult to challenge.

The answer is this: We need *thoughtful learning.* We need schools that are full of thought, schools that focus not just on schooling memories but on schooling minds. We want what policy analyst Rexford Brown in a recent study of schools called "a literacy of thoughtfulness." We need educational settings with thinking-centered learning, where students learn by thinking through what they are learning about.

While the chapters to come will revisit this theme again and

again, that in a nutshell is the message of extensive research on the nature of human thinking and learning. The rationale can be boiled down to a single sentence: *Learning is a consequence of thinking.* Retention, understanding, and the active use of knowledge can be brought about only by learning experiences in which learners think about and think with what they are learning.

Notice how this single sentence turns topsy-turvy the conventional pattern of schooling. The conventional pattern says that, first, students acquire knowledge. Only then do they think with and about the knowledge that they have absorbed. But it's just the opposite: Far from thinking coming after knowledge, knowledge comes on the coattails of thinking. As we think about and with the content that we are learning, we truly learn it.

Indeed, this even holds for the simplest kind of learning, straight memorization. Over and over again, studies have demonstrated that we memorize best when we analyze what we are learning, find patterns in it, and relate it to knowledge we already have. In other words, when we think about it. As early as 1888, the renowned American psychologist William James expressed the point eloquently this way:

> . . . the art of remembering is the art of *thinking;* . . . when we wish to fix a new thing in either our own mind or a pupil's, our conscious effort should not be so much to *impress* and *retain* it as to *connect* it with something else already there. The connecting *is* the thinking; and if we attend clearly to the connection, the connected thing will certainly be likely to remain within recall. [Italics are James's.]

Therefore, instead of knowledge-centered schools, we need thinking-centered schools. This is no luxury, no utopian vision of an erudite and elitist education. These are hard facts about the way learning works.

PRECEDENTS: SWINGS OF THE PENDULUM

The idea of informed, energetic schools focused on thoughtful learning is hardly new. Indeed, it has figured centrally in the history of education in the United States. Sometimes it has been

seen as a mainstay of the educational process, sometimes as an elitist enterprise, neither possible nor needed for the majority of students. The pendulum swings back and forth.

During the first half of this century, one of the persistent champions of thoughtful learning in the United States was the seminal educational philosopher John Dewey, a founder of the progressive education movement. Dewey had this to say about the essential role of thoughtfulness in schooling:

> Of course, intellectual learning includes the amassing and retention of information. But information is an undigested burden unless it is understood . . . And understanding, comprehension, means that the various parts of the information acquired are grasped in their relations to one another—a result that is attained only when acquisition is accompanied by constant reflection upon the meaning of what is studied.

Dewey and other advocates of progressivism envisioned a child-centered education that took account of children's interests and abilities and built on that foundation. Education, Dewey maintained, should take as its foundation what the child knew and build from there toward intellectual insight into and appreciation of the landmarks of culture and science—the wisdom of Shakespeare, Newton, and others.

But progressivism took an odd turn, one quite contrary to Dewey's picture of it. In the child-centered spirit, others began to see schooling as practical preparation for everyday life, serving students who by and large lacked the intellectual ability to aspire to more. In the mid 1940s, "life adjustment education" became the watchword, and subjects like business English and business arithmetic became the paragons of the educational enterprise. For a while, most folks seemed satisfied with a less ambitious model of education. The pendulum had swung away from Dewey.

Then, in October 1957, Russia preempted American ambitions in space and challenged the image of the United States as the premier technological power with the launching of Sputnik, the first space satellite. Concerns over the intellectual quality of the nation rekindled visions of a more ambitious kind of education.