

# Knowledge-Based Decision Making

**A**s the 21<sup>st</sup> century unfolds, two intertwined terms are becoming, if not household words, schoolhouse phrases: “data-driven decision making” and “scientifically based research.” Both are a part of the No Child Left Behind Act, but they are not important because NCLB includes them. The federal act includes them because they are important.

Data-driven decisions and scientifically based research are becoming a part of the culture of education.

Taken for granted in the high-tech world, the terms are coming of age in the education community. It is about time. Such sensible ideas are long overdue. And today rare is the educator who has not heard about them and rarer yet the policy analyst or politician from whose tongue the terms have not trippingly fallen. This is as it should be, particularly insofar as their opposite means purely subjective decision making.

Evidence and the data that comprises them are to be preferred to flying by the seat of your pants. And as knowledge is power, data are its raw material. The systematic use of data lies at the heart of scientific method, which is why the two ideas connect.

## Moving beyond intuition through data-laced wisdom leading to informed actions

### Awash in Data

The opportunity and the challenge facing today's education decision maker is to move beyond decision making by intuition to what I have begun to call knowledge-based decision making. By this I include data-driven decision making but I mean more than that.

Today's education leader, whether the leader of the school district, the school building or the classroom, must change data into knowledge, transform knowledge into wisdom and use wisdom as a guide to action. But if data-driven decision making and scientifically based research are the necessary preconditions to wise decision making, they are not sufficient. True, without data and solid evidence the modern decision maker is helpless, but simply possessing data and evidence is no guarantee of success.

There are three reasons. First, as every educator knows, schools are awash in data. At times it feels as though the data are an endless skein. What is abundantly clear is that without purposeful organization and the capacity for nearly instantaneous recall and analysis, even the most abundant data are virtually useless. Indeed, disorganized or inaccessible data have little or no value. And nowhere is Parkinson's last law—“delay is the deadliest form of denial”—more apt. The most extreme example is the state-mandated test taken in the spring with results not available until the following fall. And in a larger context, few schools have the information technology infrastructure, including hardware, software and trained personnel, to take advantage of the power inherent in school data.

Second, for most educators, data have been and remain a burden, not an asset. Compliance data are used for precisely that—to see whether you hewed to the rules and regulations. Historically, education data were something a third party told you to gather so they could embarrass you with it later. Or so many educators believed. No wonder data sat in cardboard file boxes, hidden away and largely unused, except for mandated compliance reporting. With little incen-



tive to use it wisely and well, data, like any unwanted artifact, gather dust.

It is important to note that the private, for-profit sector is not an exception to this general rule. To the contrary, without incentives to use data for decision making the private sector would let it gather dust as well (as indeed it did not so long ago). The advent of the main frame and the emergence of decision support tools in the private sector simply antedates the public sector. But what is good business practice in the private sector, when it matures, is good business practice in the public sector as well.

Third, and perhaps most important, "the technology is easy, the culture is hard." By this I mean that any major cultural shift is difficult in any organization. Only the strongest incentives make a cultural shift work, and in schools such incentives are few and weak. Because data have been used historically to point the finger of blame, it is difficult to convince educators that the next round of data collection will be used as a resource, as an opportunity to trumpet successes and seize opportunities. Once burned, twice shy. Or as Mark Twain famously said, "[A cat] will never sit down on a hot stove-lid again—and that is well. But also she will never sit down on a

cold one any more.

#### Federal Underpinnings

Tension about data collection occurs, then, because there are two broad streams of data use, one a carrot, one a stick. The same data—attendance, demographics, test scores, teacher characteristics, school spending, course-taking patterns—can be used for diagnostic or accountability purposes (or both). For example, disaggregating test scores by identifiable groups of youngsters can provide the key to either bettering instruction or finger pointing (or both). In an ideal world, such data would always be used for diagnostic and prescriptive purposes, not recriminations or blame. No one wants to be a bad or ineffective teacher so data, in theory, offers an unparalleled opportunity to improve practice. But that connection must be made or the teacher whose kids do not do well on standardized tests is left high and dry (as are his or her students).

Having said this, I re-emphasize that data-driven decision making is the foundational activity that underlies the No Child Left Behind Act of 2001. Signed into law on Jan. 8, 2002, the act is genuinely historic. In an age of hyperbole and exaggeration, it is hard to make the point convincingly, but NCLB is to this

generation what the Elementary and Secondary Education Act was to its time.

Schools gathered data for 150 years and rarely used it (except for compliance purposes). Six months into NCLB schools are now required by law to use data. They must use data to change organizational and individual behavior and they must use data to change academic outcomes. That is a tall but necessary order. And it will take time for it to work, particularly as educators see NCLB as more stick than carrot.

In the abstract, ideas about data-driven decision making and scientifically based research are beyond reproach. In a scientific era, what could be more estimable than making decisions based on careful research and compelling evidence? Research holds the promise of helping us understand what works. What more could we ask for? What indeed?

In self-defense I point out that I have been a staunch advocate of the arcane arts of data-driven decision making and evidence-based decision making. I spent a decade at the now defunct Office of Economic Opportunity and the National Institute of Education as a director of major education research projects, including the Education Voucher Demon-

ILLUSTRATION © BY LUCIANA MARILLI FOR NCLB

stration Project and the Experimental Schools Project, both large-scale federal government efforts to gain empirical information about highly charged activities ("taking the ouch out of vouchers," the Rand Corp.'s Steve Weiner called it). In that spirit I devoted a chapter of a recent book, *Raising the Standard*, to these twin ideas. As well, I devoted a substantial part of a *Phi Delta Kappan*

ture, what are its limits? To appreciate what data-driven decision making can do we must have a clear understanding of what it cannot do.

Most importantly, it cannot tell you right from wrong or good from bad. It can tell you whether a particular intervention works, but not whether a particular intervention is the right thing to do. Indeed, an intervention may work but it

the best of the American tradition (and American invention) of mass education. To be sure, once the decision to leave no child behind is made, data are critically important, but they are important as a tool. The data can tell you which children have been left behind, even which children are at risk of being left behind. But data do not in and of themselves tell an administrator or teacher or parent what to do. To repeat, knowing what to do with data is fundamentally an ethical, political and moral matter.

I mention this rather obvious point because the mantra data-driven decision making is so powerful and appealing that to some it may seem to be a substitute for informed judgment. This it should not do. Indeed, there is no substitute for professional norms or the hard-won knowledge of the experienced teacher or administrator. Data-driven decision making does not replace professional judgment. It is the handmaiden of professional judgment. It informs, it elaborates, it illuminates, it improves, but is not a substitute for it.

#### Intuitive Decisions

As important as data-driven decision making is, it is but one arrow in the decision maker's quiver—an important arrow to be sure, but nonetheless one of several. Data-driven decision making must not cause us to lose sight of the larger context, what I call knowledge-based decision making.

Knowledge-based decision making is an idea so obvious and commonsensical it is hard to imagine why it is not the norm. Is there any other way to make decisions? Unhappily, the answer is yes. The most obvious examples are political and personal, two styles that are often conflated. Log rolling and patronage are among the most egregious examples.

However, a less widely discussed example of decision making that is not knowledge based has a bearing on the school of the future. And that is decision making by intuition. So common is this among great leaders that it is almost a sign of greatness. Examples come readily to mind, from Winston Churchill to Lincoln, from Alexander to Franklin Delano Roosevelt. It is also the case that intuition plays a major role in hard disciplines. Jeremy Bernstein, Einstein's biographer, reports that Einstein's great insights were first the product of mathematical intuition, only later "proved" mathematically. Indeed some of Einstein's work exceeded his own mathematical capacities and it fell to a later

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fastback, commissioned for their millennial series, to the subject ("The Schools We Want, The Schools We Deserve").

In addition, I was asked to write the eponymously titled essay, "Data-Driven Decision Making," for the last national education summit. So I stand guilty as accused. I believe in and support data-driven decision making. I believe in evidence and the scientific method. But if data-driven decision making is the *sine qua non* of school reform in the 21<sup>st</sup> cen-

may be the wrong thing to do. From Aristotle we learn that there is "good" knowledge and "bad" knowledge, "useful" knowledge and "useless" knowledge. The point is a simple one: The decision about what to teach and who to teach is normative, not empirical. *How* to teach is the empirical question.

The decision to leave no child behind, for example, is not itself a data-driven or scientific decision. It is both a moral and political decision, drawing on

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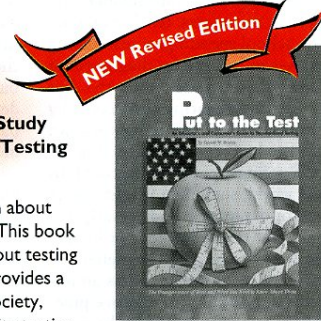
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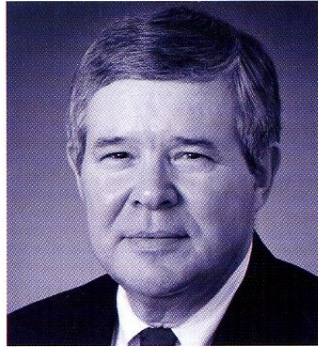
Nothing is wrong with these approaches so far as the individual examples are concerned. Would that we all had the insights of Churchill or Einstein. But that is precisely the problem. Brilliant intuition may lead to brilliant insights but ordinary intuition does not. More to the point, an enterprise like mass education cannot rely on the hope that visionary leaders will head every school. In one respect the old scientific management movement was right: Decision making should be orderly; it should be informed by facts; it should be supported by rigorous analysis; and it should be subject to constant re-analysis and re-interpretation.

At this point, I want to turn to a medical metaphor. We are all aware of modern medicine's debt to science (ironically, the notion of medicine man means a traditional or non-scientific practitioner). But this should serve to remind us that medicine is by no means all science, even in the modern era. It is still in some measure art. In particular the art of the healer is made manifest in what we call "bedside manner." It captures both the capacity of the physician to empathize with the patient as a means to reassure as well as to diagnose and treat.

The trained physician will be the first to admit that much medical decision making can be attributed to informed intuition, particularly when definitive tests or diagnostic protocols are limited. Under the pressure of progressive or chronic illness or even more dramatically shock and trauma, decisions must be made in conditions of uncertainty and ambiguity. This is particularly important in light of the widely accepted experience shared by most physicians: For the vast majority of patients who show up at the doctor's office, the symptoms spontaneously resolve. That is, they are neither cured nor diagnosed by the doctor; they go away on their own.

#### Proper Locus

This environment, with conditions of uncertainty and ambiguity and problems solving themselves as mysteriously as they arise, is not the exclusive province of medicine. Every parent, teacher and administrator recognizes it. What is important about medicine is the willingness, nay the necessity, of informing the decision-making process with facts and careful analysis insofar as it can and only



Denis Doyle

then relying on intuition. Because the education knowledge base has been so incomplete, teachers, administrators and board members are often forced to fly by the seat of their pants. In a school lucky enough to hire or find people with finely honed intuition, the approach works well. But it is not a formula for a mass enterprise.

Management expert Peter Drucker observes that the task of education is to make ordinary people do extraordinary things. He is right. But to do this on a large scale requires systematic approaches to problem solving. In the world of education, knowledge-based decision making is, of necessity, a blend of data-driven decision making and professional judgment, just as it is in medicine. Decision makers, then, must understand where the proper locus of decision making resides as well as the limits of knowledge, both derived from research and intuition.

In a school context, the question is "what is the proper locus of decision making?" Is it the board, the superintendent, the principal, the classroom teacher? The answer is captured in the awkward term "subsidiarity." It means make the decision as close to the problem (or opportunity) as possible. It means pushing decision making down the organizational hierarchy as close to the work force as possible. It means empowering teachers and building administrators. It means an end to micromanagement. It means freeing senior administrators and board members from day-to-day concerns and giving them responsibility for the big picture.

And when we are confronted with the limits of knowledge question it is not so complex as it might at first appear. Knowledge-based decision making is not a matter of perfect decision making sci-

entifically arrived at. It is a matter of consistently good decision making over time. Indeed, as political scientists know, waiting for perfect decisions makes "the perfect the enemy of the good." The secret is to seek as good information as can be found, analyze it and change or modify interventions as appropriate.

For example, Title I programs do not have to be pullout programs. Inventive and resourceful schools have begun to offer them as afterschool programs. The idea makes pedagogical and social sense and is certainly worth trying. But if the decision to do so is not based on research, as it need not be, particularly as research findings are weak or inconclusive, the decision to continue the practice should be. The practice is worth studying.

In the final analysis, schools will never be scientifically run in the way a huge laboratory or nuclear submarine is. To the contrary, they should not be. Good schools will continue to be loosely connected institutions that rely on improvisation and professional judgments that are normative, not technical. But they should self-consciously and deliberately do what medicine has done—they should look for scientifically valid and replicable findings where they can be found and use them for decision making where they can. At the same time they should be forthcoming about the limits of science and own up to what is science and what is art.

Clearly, much of what goes on in a primary school is art; the warmth and affection of a good teacher is not scientifically derived. But there is much about the instructional program that can be illuminated by careful study. Debates about phonics, bilingual education, outcome-based education and the like could be sensibly advanced, even resolved, with carefully crafted research protocols.

#### Learn From Errors

A final cautionary note is order. A failure to organize and conduct careful research puts the whole education enterprise at risk. Consider again Title I. It is hard to imagine a better-intentioned program than math and reading services for the poor and dispossessed. Who needs them more? How could scarce public resources be better targeted? That, of course, is the question that educators and policy analysts must be able to answer.

What bang for the buck is there? Re-

sources are finite and it is reasonable to examine the impact of the program. And the examinations of Title I that have been completed are not encourag-

sort of Platonic ideal that has never come to earth. It may be that the research has been poorly designed and executed. Or it may be that the program

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ing. Nearly a billion dollars spent over Title I's 38-year lifetime does not reveal any "sustaining effects." Why not? It may be an artifact of the program—it is so diverse in implementation that Title I exists only in statute and not in reality, a

has no intellectual starch and is all a big mistake.

The real mistake, of course, is to design and put in place a program based on assumptions that do not pan out or cannot be measured. President Lyndon

Johnson thought, in good faith, that Title I would improve the lives of poor children. It may have, in ways that the research has not found. But to report in the dawn of a new century that the most ambitious federal government program in the history of elementary and secondary education has "no sustaining effects" invites cynicism and puts Title I itself at risk.

Let me close with a final and compelling medical example, drawn from a recent book by surgeon Atul Gawande, *Complications: A Surgeon's Notes on an Imperfect Science*. Gawande, a *New Yorker* staff writer on medicine and science, makes the medical case for blending scientific knowledge and professional judgment much as I have tried to make the education case. His book title, Gawande tells us, comes "from my concern with the larger uncertainties and dilemmas that underlie what we do." He goes on to observe that "what seems most vital and interesting is not how much we in medicine know but how much we don't—and how we might grapple with that ignorance more wisely."


I commend the book in its entirety to anyone interested in improving education practice, but his most salient single point for educators is the M & M Conference (Morbidity and Mortality Conference). Typically held each week, at least at teaching hospitals, the M & M Conference gives doctors the opportunity to talk openly about what went wrong, including errors of judgment or out-and-out mistakes, without fear of either legal harassment or professional disapprobation. That everyone makes mistakes is a given. To make mistakes can be a powerful learning tool, but it requires a special setting, one in which mistakes can be admitted, discussed and analyzed. That is what the M & M conference is all about and that is the difference between using data for diagnosis and using data for accountability.

If educators were to make one learned borrowing from medicine that would be it: knowledge-based decision making, a blend of scientific evidence based on data and hard-won professional judgment that, taken together, is that mix of intuition, insight and experience that we think of as wisdom. ■

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