A Primer for Education Reformers

(Adapted from newspaper columns appearing in The Orlando Sentinel
and other newspapers served by Knight-Ridder/Tribune Information Services)

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Contents

What's wrong with America's schools?

Just about everyone, from the president down to yesterday's dropout, has an opinion about what's wrong with America's schools.

Most of the theorists are convinced their theories are good ones. After all, they argue, having spent from twelve to twenty years as system insiders, their theories are based on solid, firsthand experience.

Among the theorists, experienced educators aren't very influential. This is, after all, America. Power and money are respected, so it's the theories of the politicians and the leaders of business and industry that are presently driving most education reform.

"A Primer for Education Reformers" presents the views of a long-time educator who thinks the present thrust of education reform is ill-conceived and superficial, and will ultimately prove to be destructive.

[1]

Going nowhere

Anyone who's ever tried to lose weight, squeeze out more miles per gallon or attract customers to a business knows something about The Law of Diminishing Returns. The first few pounds usually come off fairly easily. A little more air in the tires will make an immediate difference in mileage. A half-page ad in the newspaper may bring in fifty new customers.

After that, it gets tougher. The closer a system gets to its peak performance, the harder it is to make a difference. After a while the payoffs aren't worth the additional money, time, or trouble. When that happens a whole new approach may be necessary—exercise to go along with the diet, buying a different car, moving the business to a better location.

As it does in other dimensions of life, the Law of Diminishing Returns operates in education. Reformers push magnet schools, charter schools, vouchers, choice, new technology, flexible scheduling, longer school days and years, textbooks borrowed from other countries, performance-based pay, jawboning, abolition of tenure, grade retention, tightened graduation requirements, school ranking, public humiliation, constant testing, privatizing—just turning schools over to business interests.

But not much happens. Even the schools we point to with pride—well-funded institutions in upscale suburban neighborhoods supported by caring parents and offering all available Advanced Placement courses—aren't doing anything spectacular. They're still loaded with kids who aren't even close to realizing their full potential, still turning out mostly average students, still sending out graduates who, in a few months or years, can't pass the exams they aced as students.

Advocates of particular reforms point with pride to certain schools they believe prove their approach is the key to success. More often than not, however, the progress they report, if it's real, is a consequence of factors other than the reform measure they advocate.

America's educational system has about peaked out. Most school districts have improvement projects underway, but it's usually only the active participants in those projects who improve. On a grander scale, the 1990 national education summit attended by many state governors kicked off the current high-profile reform effort called "Goals 2000: Standards and Measures." It hasn't really made a significant difference in student performance. The main message: Work harder. In many states and school systems, the message is a little longer: Work harder, or else.

Working harder isn't the answer. In fact, if the work has no clear aim, if it's superficial, if it's distasteful or unsatisfying, if it comes at the expense of other worthwhile activity, if it's at odds with how the brain works, it can easily be counterproductive.

No, working harder isn't the answer. We have to work a whole lot smarter. Working smarter means doing things differently, and doing things differently isn't easy. Ideas long held settle into grooves. Eventually the grooves turn into ruts so deep it's hard to see over their sides, much less climb out of them.

The beliefs and values that drive America's system of education have been in place for so long they've become articles of faith, and around articles of faith protective bureaucratic and emotional walls get built. It isn't just the education establishment that resists change, it's everybody—parents, politicians, policy makers—even students.

But, as H.G. Wells reminded us, "Civilization becomes, more and more, a race between education and catastrophe." If we hope to still be around to celebrate the end of another millennium, we've got to drag ideas we take for granted out into the open and begin to poke and prod them to see if they're up to the task of saving us from ourselves. Just one fallacy, tightly held, has the potential for doing us in. We hold tightly not just to one but to several educational fallacies, and we're not even aware of them, much less talking about how to break their hold.

When a society stops questioning why it's doing what it's doing in education, "reform" boils down to merely putting a higher polish on familiar rituals. If the world didn't change, maybe we could afford to coast along on the wisdom of our parents and grandparents. But environmental, demographic, technological, and economic change are changing American and the world, and at a rate unparalleled in human history. What we're doing isn't good enough. If every student in America was doing as well as the best students in the best schools are doing, it still wouldn't be good enough.

If we hope to survive as a society, kids have to be taught how to mentally sort out and make sense of a volume of raw information undreamed of a generation or two ago. They have to be taught how to use what they learn to track changes in the world around them, changes that are exceedingly complex and often beyond human ability to control. And then they have to be taught the enormous range of skills they need to control the changes that can be controlled, and adapt to the changes that can't be controlled.

That's doable, but we're not doing it.

Present reform efforts may make marginal improvements in student performance, but they (1) aren't up to the challenges that lie ahead, and (2) they'll probably backfire.

[2]

Reform prescriptions

Education reformers tend to fall into one of three broad groups. The largest group is made up of the "all you gotta do" people, people who're sure their reform prescription will cure schooling's ills.

They believe (choose one): Things were better in the good old days. What schools need are really tough discipline policies. Social promotion should be outlawed. Someone is to blame for the present situation—teacher unions, John Dewey, liberals, conservatives, the feds—someone. The Ten Commandments should be prominently displayed. Reading is the key to academic success, and phonics instruction is the key to reading. Today's or tomorrow's technology will come riding to the rescue. Zero tolerance should be rigidly enforced. Education courses are a waste of time. Socialist ideas have infiltrated the system and need to be rooted out. Frills have taken over at the expense of the basics. Et cetera.

The second group of reformers is made up mostly of educators and other "insiders." They're too close to the action, too aware of the complexities of educating, to think there are simple cures for what ails the institution.

That very closeness, however, tends to color their approach to reform. They look at their own classes, their own schools, their own frustrations, their own unmet needs, and think small. Caught up in the day-to-day of educating, they generate a never-ending stream of reform proposals: Smaller classes. Flexible scheduling. More planning time. Drastic reductions in bureaucratic paperwork. More parental support. Team teaching. Mixed age groupings. Time to observe other teachers teaching. Administrators with assigned teaching responsibilities. A realistic instructional materials budget. Looping. Homogeneous grouping. Heterogeneous grouping. Community service. More hardware. More software. Teacher aides. Less political interference. A disconnected public address system. Sufficient pay to cause quality people to consider entering the profession. Et cetera.

It's hard to take the "all you gotta do" reformers seriously. Most simply vastly underestimate the complexity of education's problems or have greater faith in some policy or procedure than the policy or procedure warrants. Some push their ideas with such fervor it arouses suspicion of a hidden agenda or an emotional problem. For others, nostalgia puts a rosy glow on a dimly remembered past, assigning it merit that doesn't stand up to scrutiny.

The educators, of course, should be taken seriously, but most of the myriad reforms they advocate cost money. In matters educational America has never been and

isn't now ready to put its money where its mouth is, so the reform strategies advanced by institutional insiders aren't likely to lead to a future much different from the status quo.

Forget, then, those two groups of reformers. They're playing very marginal roles. The main blueprint for the current reform movement, the reform movement bulldozing every other reform effort out of the way, is "Goals 2000: National Standards and Measures." The document and the ideas it promotes emerged from a 1990 national education summit meeting of state governors and federal education officials, backed by leaders of business and industry. (Working educators weren't invited.)

In every society in every era, the elders roll their eyes in despair at what the young don't know. Prior to the 1990 national education conference, and no doubt doing much to shape it, two think tankers who knew their way around Washington D.C., gave education reform leaders plenty to roll their eyes about and a lever for action. In 1988, Diane Ravitch and Chester E. Finn, Jr. published a book called *What Do Our 17-Year-Olds Know?*[1]

As might be expected, they wrote the book because they believed the answer was, "Not much!" and they wanted everyone else to agree. Mixed in with the text, sometimes on every page, were bordered gray blocks. In each block was a multiple choice question asked of a sample of 11th graders, followed by their averaged scores.

When *What Do Our 17-Year-Old Know?* was published, newspapers across the country carried examples of the questions ("Who wrote The Return of the Native?") and listed student scores. Emphasized, of course, were those questions which newspaper editors thought their readers could answer that were muffed by lots of the high school juniors. Public hand-wringing rose to a level that made political involvement inevitable.

Prodded by all the media attention, the hand-wringing was predictable, but the consternation was an overreaction. Not in recent centuries have two generations shared a really broad spectrum of knowledge. Social change sees to that. However, to think that this is altogether a bad thing is to fail to understand the adaptability that social change requires. If there's ever a generation that knows only what the generation before it knew, it can kiss its survival chances good-bye.

But never mind raising those kinds of issues. Never mind asking whose ideas about what was important determined the survey questions in What Do Our 17-Year-Olds Know? Never mind asking what made the politicians and the business leaders who

[1] Since Diane Ravitch co-authored this book, she has changed many of her views about educational reform, and is a (or THE) leader in opposing the so-called "reforms" of the corporate-based reformers. She first spelled out her changed views in her book *The Death and Life of the Great American School System*.

attended the 1990 conference think that they were peculiarly qualified to set the direction of American education. They just did it. In the years since the Goals 2000 conference, all across America, there's been enormous pressure on educators to write "standards" and devise "measures" that tell how well the standards are being met. Backed by the money of Bill Gates and others, the "Common Core State Standards" (CCSS) and similar documents were issued (with little review by educators). They were then imposed—with the accompanying standardized tests—on our nation's schools. Some educators have refused to go along, some have complied under duress, some—convinced that what they happen to know warrants their being labeled "educated"—have been happy to volunteer for the standards and accountability writing teams.

"Standards and accountability" has proved to be a prize-winning sound bite. Most of the public thinks it's about time there were standards and accountability, leaders of business, industry and the media think it's great, it's helped to propel into office candidates for school boards, state legislatures, governors, Congress, and the U.S. presidency, and leaders in both major political parties agree that "standards and accountability" is a solid step in the right direction.

The bottom line assumption of the participants in the 1990 conference was that "The Problem with Education in America" was a people problem. They may have agreed with the management thesis that when a business or industry isn't performing adequately, there's probably something wrong with the system, but they didn't think that applied to education. And they still don't. They're convinced that the system is basically okay, that it's the people in it who are to blame for its poor performance, and By Gawd they better shape up. What students and teachers need, the standards and accountability people believe, is religion, America's religion—a massive dose of market forces: Raise the bar and stimulate competition. Human nature being what it is, the drive to survive being so powerful, given the option of swimming or sinking, people will choose to swim. And, once having learned to swim, market forces will prod them to swim ever faster.

So introduce competition, competition with a vengeance. Pit student against student, teacher against teacher, administrator against administrator, school against school, system against system, state against state, nation against nation. Stimulate the competition by constant testing, by publicizing performance statistics, by holding failure up to public shame, by heaping praise or money on the successful. Stimulate competition with vouchers, with school choice plans, with pay tied to performance, with threats of dire consequences for failure. Anything. Sure it's a little brutal, sure it makes most students and teachers losers, but that's life. Let Darwin take the hindmost.

"For every problem there's a solution that is simple, straightforward, and easy to understand. And wrong."

[3]

Standards and Accountability

To operationalize market forces in education, true believers have put their faith in two tools: standards and accountability (S & A).

Business and industry leaders, pushing the politicians, are pretty much running the current reform show. In almost every state, broad legislation has forced educators to follow through on S & A, or suffer some rather serious consequences. Those who protest that the S & A movement is simplistic, that it fails to address the real issues, that it's driving the best teachers out of the profession, that in the pursuit of minimum standards maximum student performance is being sacrificed, that diligently pursued, S & A will ultimately run the institution into the ground—those who try to make those arguments are either ignored or dismissed as self-serving.

Dismissal is easy and effective. Instead of entering into dialog with those who think the S & A movement is ill conceived and counterproductive, S & A proponents accuse those who question them of being anti-reform, of having a vested interest in the status quo, of being opposed to educational standards and, most tellingly, of being unwilling to be held accountable for their work.

The accusations are unjustified. Period. It would surely be hard to find an educator who has no standards and who doesn't believe in accountability. The questions that need to be asked and answered are whose standards, and what system of accountability? Those are the issues, but having found in the S & A sound bite an appealingly simplistic and useful slogan, and having found in students and teachers convenient scapegoats to blame for the present situation, the "Standardistos[1]" have thus far been able to refuse to debate the issues.

The two very concrete products that came out of the 1990 conference are "standards" in the form of lengthy documents at state and local levels setting out "what students are expected to know and be able to do," and standardized tests that are supposed to find out to what degree the standards are being met.

So what could possibly be wrong with lists that detail what it is that students are supposed to know and be able to do? At the most elementary level, nothing. Kids need some basic skills. But few standards documents stop there. Most are well on their way to laying out what their creators think is a complete education. They're trying to get ever more specific, trying to nail down the details, trying, finally, to devise a teacher-proof or teacher-not-needed package for educating the young.

[1] A term coined by Susan Ohanian.

Underlying most of the detailed standards documents are assumptions which those who wrote them either don't understand or choose to ignore. Here are some of them:

> ● What the next generation most needs to know is what this generation happens to know. ● Educating is a pretty straightforward process which, in the words of Louis Gerstner, CEO of IBM, has to do mostly with "the distribution of information." ● If schools will just "raise the bar," students will clear it. ● The student potential wasted by one-size-fits-all programs isn't worth developing. ● Students turned into failures by their unwillingness or inability to meet standards won't be a problem. ● The subjects and courses for which standards are written give students a comprehensive, balanced view of what's worth knowing. ● Simply absorbing information is more important than learning how to create and manipulate it. ● It's more productive to focus attention on minimum collective performance than on maximum individual performance.

Every one of those assumptions deserves careful study, for an unquestioning acceptance of any one of them can, no, will doom meaningful education reform. Every one of them is pretty much an article of faith for the backers of the standards and accountability movement. And every one of them is either seriously questioned or outright rejected by armies of educators.

The superficiality of most standards documents is matched by the superficiality of most of the tests administered in the name of accountability. We're in a testing orgy, and if it isn't stopped, if we don't begin to understand that it's societal suicide to tie what's taught to our extremely primitive ability to test, we're doomed.

Never before has so much ridden on the results of standardized tests. They serve as a basis for passing students and holding them back, for rating the quality of schools, for identifying good and poor teachers, for awarding or withholding pay, for deciding who does and who doesn't graduate, for giving money to high-performing schools and taking it away from poor ones, for giving money to poor-performing schools and taking it away from high-performing ones, for deciding who's eligible for vouchers, for promoting the cause of school choice, and for pointing fingers of blame and ridicule. The old idea that the only good reason to test was to troubleshoot a kid's problem and decide what to do next has pretty much gone by the boards.

Behind the testing frenzy lies an article of faith, an idea accepted without question, that all learning can be evaluated, that if it can be taught, it can be measured with precision. In fact, if something learned can be measured with precision, it probably isn't worth knowing.

There isn't anything wrong with occasional small-scale testing of reading, spelling, and other relatively simple skills. But tests that attempt to go beyond that are a curse. A school could turn out graduates who were thoughtful, responsible, creative,

caring, interesting, courageous, trustworthy, perceptive, in love with learning and seekers after wisdom. But if not enough test takers could remember who said "Speak softly and carry a big stick" or that Aesop was best known for having written fables, the kids and their school would be in big trouble.

On the other hand, the school across town where students spent the entire year drilling in preparation for the big standardized test would make the headlines. Praise would be heaped on it when it should be penalized or closed down for the criminal waste of young minds.

The more worthwhile the educational aim, the less that's known about how to measure progress toward it. Albert Einstein put it this way: "Not everything that can be counted counts, and not everything that counts can be counted." Accountability proponents, of course, don't agree, and they're willing to set the entire course of young lives by forcing on them standardized tests which they themselves, when asked, invariably refuse to take.

The same kind of probing questions that aren't being asked about standards need to be asked about the standardized tests that are the mainstay of the current approach to accountability:

> ● Who's writing the questions? ● Are they qualified to set the course for American education? ● Who says so? ● What criteria are they using to decide what it's really important to know? ● Which cultural or societal perspective do they write into their questions? ● What's the relationship, if any, between test performance and real life performance? ● Is verbal ability so much more important than other abilities that a test of it merits playing a life-altering role? ● What do test scores really mean? Is standardized testing philosophically consistent with local control? ● Why are standardized test questions not open to public scrutiny? ● Who's in charge of coordinating what's taught with what's tested? ● Who should be in charge? ● Is public understanding of published raw scores adequate to guide public policy? ● How relevant is the time factor in test taking? ● How good are the test makers at writing questions that measure a student's ability to draw inferences, generate hypotheses, generalize, synthesize knowledge, make defensible value judgments, and engage in all the other thought processes that daily life demands?

Then, of course, questions could be asked about the seamier side of testing, questions about all the devious strategies used to skew standardized test scores and put them in a more favorable light: Are those kids who are most likely to drag the school's average down told to stay home or sent on a field trip on test day? Are they temporarily suspended? Are they identified as disabled and therefore excused from test taking? Does the school invest in special test prep materials? Does it start two or three weeks early to build in extra test preparation time? Are teachers circulating during testing, asking kids

if they've *really* thought about their answer to Question 15 or 22? Is the test gradually made easier or cut off scores changed to give the impression of progress? Are kids drilled on how to guess at answers to increase their probability of success? Are whole subjects and courses dropped from the curriculum and replaced with test preparation activities?

Necessity is the mother of invention. Educators who think their reputations or their livelihoods depend on the results of a test they think is illegitimate can be pretty ingenious.

There's a reason that just about every professional organization for every academic discipline has adopted a formal resolution opposing the current testing frenzy, and it isn't because their members are afraid of accountability. They oppose it because it's simplistic and destructive.

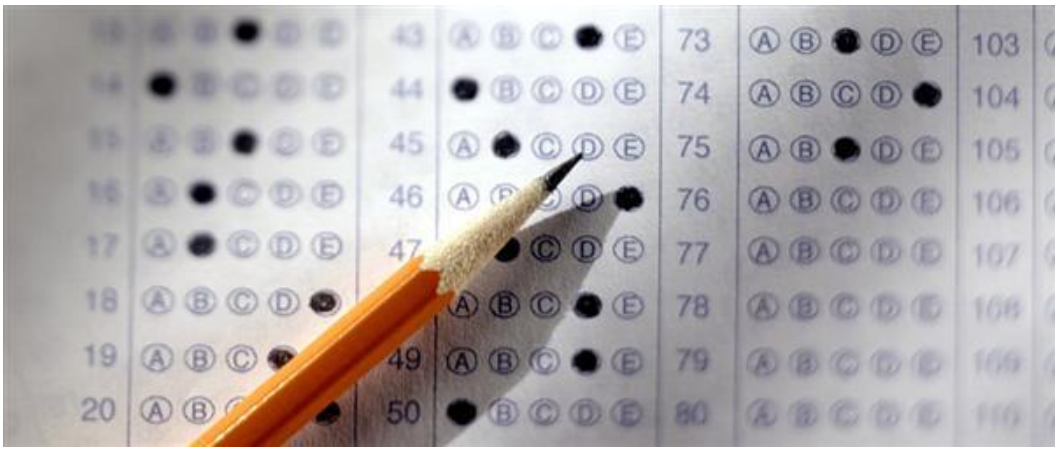
"Standards & Accountability" strives to reduce teaching and learning to a near-mechanical process, and it fails to take account of the great differences in students. It emphasizes learner recall of secondhand information to the neglect of dozens of higher-order thinking processes too complex for standardized tests to evaluate. It sentences students to years of dreary plodding through intellectual territory as desolate as a crossword puzzle with all the blanks filled in. It guarantees that ever fewer people will enter the teaching profession, that those who do will be less qualified, and that the societal catastrophe H. G. Wells predicted will come sooner rather than later.

That minority of teachers whose work has in the past been most likely to inspire the young to follow in their footsteps weren't teaching with a standardized test in mind. They were stretching themselves and their students into fresh intellectual territory, knowing that in a rapidly changing world, the ability to create new knowledge is far more important than recalling secondhand knowledge.

What has always pulled the best people into the profession and kept them there has been its inherent complexity. No other profession, not brain surgery, not rocket science, not politicking, is as difficult as is shaping the images of reality in young minds. Reduce teaching to a standards-based formula, reduce evaluation to the standardized test, take away teaching's intellectual challenge, and doubling starting salaries won't attract to the classroom and hold those the young most need to know and respect.

The testing tail is wagging the education dog.

If we teach only what we know how to test, we won't survive. We won't deserve to survive.



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The fallacy

Competition, true believers in standards and accountability believe, will be the salvation of education. Human nature, they argue, guarantees it. Human nature being what it is, market forces work well in the market. But human nature being what it is, they don't work well where the rubber meets the road in schooling—in teaching and learning. Because they substitute extrinsic for intrinsic satisfaction, market forces undermine the firmest of all possible foundations for learning.

Learning, like love, is its own reward. It meets one of the strongest of all human needs and therefore pays off in deeply satisfying ways. Substitute extrinsic for intrinsic satisfaction—threaten the teachers and the kids with humiliation if they fail, reward them with praise and other goodies if they succeed—and getting the praise and avoiding the penalties are the emotions that drive the system. Love of learning for its own sake dies. Dead.

Love of learning. That's what the politicians and policymakers should be selling, not grades, honor rolls, certificates, or one's name in the newspaper, not avoiding embarrassment or escaping being grounded because of a low grade. Those strategies may very occasionally be marginally effective, but reading chapters in a book to get bars of candy will create far more lovers of candy bars than lovers of books.

There's an inordinate amount of hypocrisy within the ranks of those who claim that bringing market forces to bear in education will cure its ills. They're determined to increase the intensity of the competition in the classroom, but suggest that competitive pay might help fill those two million teaching positions that are going to be vacated during the next decade and they change the subject. Mention decent salaries and they want to talk about "the joys inherent in molding young minds," or "the satisfactions that come from shaping the future."

The drive to compete may or may not be the most powerful human drive; the jury is still out on that question. But there's no doubt at all that it's human nature to seek answers to questions, human nature to try to satisfy curiosity, human nature to expand awareness, human nature to learn. If kids have to be bribed or threatened to get them to buy what the school is selling, true believers in market principles need to face the fact that the problem must lie with the seller not the buyer, with the product not the customer, with the system not the people.

The system isn't working, and the kids know it and show it. They can't put their fingers on what's wrong with school, but their actions speak plainly. Laws are necessary to get them inside the walls. Many have to be bribed with grades or threatened with bleak futures or legal action to keep them there. An appalling number drop out at the first opportunity. Learning—the most natural and satisfying of all human activities—loses its inherent appeal for most students sometime during the middle years of elementary school. Rarely is that appeal regained.

Obviously, what we're doing isn't cutting it.

And it isn't going to cut it.

Market forces fix few of education's problems but create many new ones, including killing off a love of learning.

[5]

It's not the people, it's the curriculum

For more than a thousand years after the 2nd century, the Ptolemaic system "worked." Ptolemy's theory—that the earth was the center of the universe—explained to the satisfaction of all who cared why the sun and moon rose and set and why the stars appeared and disappeared.

But the knowledge returns on Ptolemy's theory diminished. That the theory couldn't answer certain questions increasingly bothered those interested in the heavens. Early in the 16th century, the Polish astronomer Copernicus said that Ptolemy was wrong, that the sun wasn't going around the Earth, the Earth was going around the sun, and the reason there was night and day was because the Earth was turning on its axis. This single theory gave birth to modern astronomy.

In the 18th century, Sir Isaac Newton formulated the laws of gravity and motion. He described to the satisfaction of all who cared why apples dropped to the ground, why what went up came down, and why objects of different weight fell at the same rate.

But the knowledge returns on Newton's theory, great as they were, diminished. Its inability to answer certain questions increasingly bothered those interested in such matters. In the 20th century, Albert Einstein advanced the theory of relativity and modern physics was born.

What Copernicus did for astronomy, and what Newton and then Einstein did for physics, Antoine Lavoisier did for chemistry and Sir Charles Lyell did for geology. They didn't build on someone else's ideas, they advanced theories that zigged off in totally different directions.

That kind of zig is way overdue in education. The present theory of teaching and learning ("If you throw enough mud on the wall, some of it is bound to stick,") has maxed out. Its design limitations have been reached. Even heroic investments of effort, time, and money will produce only marginal improvements in student performance.

Any reform of consequence will have to begin by making right what's wrong with the system. And what's wrong with the system lies at its very heart. Educating is about what's taught and learned—the curriculum. That's where the problem lies. The current reform movement isn't just ignoring this fact, it's promoting standards and administering tests designed to freeze the curriculum adopted in 1893 in permanent place.

So, what's wrong with that curriculum? Respected scholars have for generations been pointing the problem out, but no one seems to be listening.

Harlan Cleveland: "It is a well-known scandal that our whole educational system is geared more to categorizing and analyzing patches of knowledge than to threading them together."

Neil Postman: "There is no longer any principle that unifies the school curriculum and furnishes it with meaning."

Mervyn Cadwallader: "(The general education curriculum) lacks coherence, integration, synthesis."

Jonathan Smith: "To dump on students the task of finding coherence in their education is indefensible. Colleges shouldn't be allowed to collect tuition on that basis."

Gordon Cawelti: "The traditional, separate-subject curriculum at the high school level is typically not based on the question of what knowledge is of most worth."

Philip Sabaratta:"Students rarely have an opportunity to discover what one set of ideas has to do with another set of ideas."

Mark Curtis: "The chaotic state of the baccalaureate curricula may be the most troubling problem of higher education."

David Cohen: "The U.S. does not have a coherent system for … articulating curriculum."

James C. Coomer: "Our educational systems … are now primarily designed to teach people specialized knowledge—to enable students to divide and dissect knowledge. At the heart of this pattern of teaching is … a view of the world that is quite simply false."

Frederick Rudolph: "The curriculum is like a bazaar, and students like tourists looking for cheap bargains."

Robert Stevens: "We have lost sight of our responsibility for synthesizing learning."

Daniel Tanner: "All of our experience should have made it clear by now that faculty and students will not derive from a list of disjointed courses a coherent curriculum revealing the necessary interdependence of knowledge."

Buckminster Fuller: "American education has evolved in such a way it will be the undoing of the society."

John I. Goodlad: "The division into subjects and periods encourages a segmented rather than an integrated view of knowledge. Consequently, what students are asked to relate to in schooling becomes increasingly artificial, cut off from the human experiences subject matter is supposed to reflect."

William H. Newell: "The problems now faced by our society transcend the bounds of disciplines. Their solution requires the breadth of vision and skills of synthesis and integration."

Leon Botstein: "We must fight the inappropriate fragmentation of the curriculum by disciplines."

Report of the Association of American Colleges' Project on Redefining the Meaning and Purpose of Baccalaureate Degrees: "The abundance of reports prescribing for our schools and colleges, the urgency with which they are argued, the evidence that they summon, and the analyses they offer are persuasive evidence that there is a profound crisis."

The present curriculum, based on specialized fields of study, has been in place for more than a century. Around the various fields vast bureaucracies have formed. Schools have departmentalized, and the departments compete for students, money, and curricular slots. Teachers are trained and licensed in specializations. National professional organizations promote the fields, publish journals, organize conferences, and take political action.

But no organization or system encourages the specialized fields to communicate with each other, much less to raise questions about the assumption that a random assortment of specialized studies provides an acceptable general education.

There are, here and there, attempts to build bridges between the specialized fields or to minimize them by focusing on problems, themes, or projects. The efforts reflect an understanding of the problem, but they don't solve it.

Interdisciplinary, multidisciplinary, transdisciplinary, and cross-disciplinary studies do provide insight and understanding. What they don't do, can't do, is show the whole of which the disciplines are parts. They don't do that because, in addition to all the bureaucratic fences around them, they have different aims, use different vocabularies, employ different conceptual frameworks, ignore vast areas of important knowledge, and operate at different levels of abstraction and generality. They can't be integrated, but even if they could be, the result would be intellectually unmanageable by even the best of students.

Specialized studies are, of course, absolutely essential. We've created a society that can't function without them. Indeed, students should be able to pursue many more specialized studies than are now available to them. But a society the members of which have no sense of the whole of which their specialized roles are parts is a society without vision, without a collective spirit, without direction. It's a society unlikely to long survive.

Schools are in the knowledge business. The curriculum is what schooling is all about, and it's at odds with the fundamental nature of knowledge and the holistic, seamless way we perceive it.

[6]

Curricular problem Number One: Aim

In our single-minded pursuit of improved instruction in math, science, language, social studies and other subjects, we've lost sight of the purpose of education. We've come to think that introducing students to a handful of academic disciplines is what school is all about. It isn't. Academic disciplines, courses and subjects are mere means to a greater end. We've made them ends in themselves.

On June 17, 1744, commissioners from the English colonies of Maryland and Virginia negotiated a treaty with the Indians of the Six Nations at Lancaster,

Pennsylvania. As part of the deal, the Indians were invited to send boys to William and Mary College.

The next day the Indians sent back an answer:

> "We know that you highly esteem the kind of learning taught in those Colleges, and that the Maintenance of our young Men, while with you, would be very expensive to you. We are convinced that you mean to do us good by your proposal; and we thank you heartily. But you, who are wise, must know that different Nations have different Conceptions of things and you will therefore not take it amiss, if our Ideas of this kind of Education happen not to be the same as yours. We have had some Experience of it. Several of our young People were formerly brought up at the Colleges of the Northern Provinces: they were instructed in all your Sciences; but, when they came back to us, they were bad Runners, ignorant of every means of living in the woods… neither fit for Hunters, Warriors, nor Counsellors, they were totally good for nothing.
>
> "We are, however, not the less oblig'd by your kind offer, tho' we decline accepting it; and, to show our grateful Sense of it, if the Gentlemen of Virginia will send us a Dozen of their Sons, we will take care of their Education, instruct them in all we know, and make Men of them."

A fair judge would have to say that the Indians' proposal was the more thoughtful of the two. The colonists said, "We'll send your boys to school." The Indians said, "We'll turn your boys into men." What the colonists' offer lacked that the Indian offer made clear was schooling's purpose.

When it comes to aims and purposes, the S & A reform movement hasn't moved much beyond the thinking of the Maryland and Virginia Commissioners. Ask a dozen reformers what they think is the overarching purpose of schooling, and the response will be a dozen long pauses. Press the issue, and pulled from distant memories may come, "To prepare students for democratic citizenship," "Meet individual needs," "Transmit societal values," the U.S. Department of Education's, "Prepare students for college and careers," or any one of a dozen or so other answers.

Given public education's importance, its long history, the scrutiny it gets, and the vast amounts of money invested in it, it may be hard to believe that the question of purpose wasn't settled long ago. Believe it. There's general agreement that the young should be taught the 3 Rs, but that's where consensus ends.

The consequences of a lack of purpose aren't hard to find. A John Leo editorial in U.S. News and World Report titled "The new Trivial Pursuit" spells out one of them:

> "U.S. News and World Report's college guide is a fine bit of work, a useful tool for students and parents. But there is one thing it does not attempt to do: explain what is actually being taught on campuses …

> "Colleges are unsure of their mission, buffeted by consumer pressures and ideological forces, and unwilling to say what a sound education might consist of. As a result of this confusion and drift, campuses are increasingly at the mercy of fads and trends."

Leo then illustrates his point. The University of Wisconsin offers a course on soap operas. Students at Duke can sign up for "The Physics, History, and Techniques of Juggling." Courses about vampires are available at several big-name universities. A hot craze is food studies. It's popular with students who like to eat, talk about what they're eating, and assure themselves of a passing grade.

School committees write reform curricula, television productions examine education reform, books on education reform make best-seller lists, uncounted articles and editorials praise and criticize reform, candidates win elections with education reform proposals, students take battery after battery of standardized tests—high-stakes tests that have life-altering potential—and behind all the words and images lies no clear philosophical position on the purpose of schooling.

We've lost sight of the point of educating. Certainly it's a good thing if students are prepared to enter the economy. Certainly it's a good thing if they're prepared for democratic citizenship. Certainly it's a good thing if they're culturally literate.

But the ultimate purpose of a general education isn't to hammer the young into shapes that will fit the economy, the polity, or the society. What, finally, a general education is all about is helping us make more sense of human experience. We want answers to three questions: What's going on here? Why? So what?

Education reform that works will have a clear aim. The aim that makes possible all legitimate aims is maximizing learner potential to think clearly and productively.

[7]

Curricular problem Number Two: Structure

Preparing to put a jigsaw puzzle together, we study the picture on the lid of the box. It's the grasp of the big picture—the whole—that helps us make sense of the individual pieces. The standard, familiar curriculum doesn't give kids the big picture. It gives them a little biology, a little poetry, a little history, a little of this, a little of that, but

nothing about how the bits and pieces relate and reinforce each other. There isn't even a hint that the bits and pieces are *supposed* to relate and reinforce each other.

Convinced that the whole of knowledge is intellectually unmanageable, we study it piecemeal. However, it isn't the amount of information but its apparent randomness that's the problem. No one knows how much information the human brain can handle if the information is organized.

Organization is essential. A system of organization—the alphabetizing of names—makes it possible to find, in a matter of seconds, a phone number in a phone book.

A system of organization—the periodic table of the elements—made it possible to predict the existence of the element germanium before it was actually discovered.

A system of organization—an organization chart—makes it possible to quickly grasp a company's approach to the distribution of human resources.

Systems of organization make it possible to find a particular book in the library, a particular kind of cereal in the supermarket, a particular automobile tail light in a junkyard, a particular departure gate for an airplane flight.

We take our systems of organization for granted, but it's no exaggeration to say that it's systems of organization that make civilization possible. For everything from the most mundane action, such as getting a cup from a kitchen cabinet, to the most esoteric research in biology or physics, it's awareness of a system of organization that guides action. The better the system, the more efficient or effective the action will be.

From this it follows that, if we want to improve something, taking a long, hard look at its system of organization is a good place to start.

We want to improve our schools. We should, then, be carefully examining the organizing systems that shape them.

There are plenty of systems to examine. Systems of organization sort students, assign them teachers, set schedules, lay out instructional programs, check on individual and collective performance, establish consequences for success and failure—in short, systems of organization control the educating process from start to finish.

Educators, worried about system effectiveness and under the gun from politicians, policy makers and the general public, constantly fiddle with these systems, experimenting with different ways of sorting students, different staffing arrangements, different schedules, different ways to measure performance, different strategies for controlling and motivating behavior.

Unfortunately, the one system of organization that gets the least educator attention is the one that's far and away the most important—the student's mental system for organizing knowledge.

Think of the student's brain as library, as supermarket, as junkyard. Then, follow the student through the school day, watching and listening, as into that library, into that supermarket, into that junkyard, a conveyor feeds a constant stream of information and dumps it in an unorganized heap. That which we see as essential in every other dimension of daily life—a system of organization—is routinely ignored in the one place where it matters most: in the mind of the student.

In earlier times, when the volume of information directed at students was far less, when there was more agreement about what the young needed to know, when there was little awareness of the importance of teaching people to think for themselves, the need for a system for organizing knowledge was less apparent. Then, rote learning worked reasonably well. But we're deep into an information explosion, there's no consensus on the aim of education, and, as some Asian countries have concluded, an emphasis on rote learning may pay off in high standardized test scores, but at the cost of creativity, innovative thinking, and undue dependence on authority.

Rote learning, learning in which a system for organizing knowledge is either unnecessary or else is imposed on the student, no longer comes even close to meeting the challenge of educating. What students need now but aren't getting is a comprehensive system for organizing knowledge, a system they understand, a system that allows them to store information and then, days, weeks, months or years later, find it, a system that supports the way we learn most of what we know—the discovery of relationships between aspects of reality. What makes that possible is a knowledge-organizing system that depends not on memory but on logic. As is evident from how little most adults can recall of what they once learned in school, unaided memory simply isn't up to the task.

For most people, even for far too many educators, this is unfamiliar territory. It's assumed that the main point of schooling is to pass along to the young the answers to a million questions.

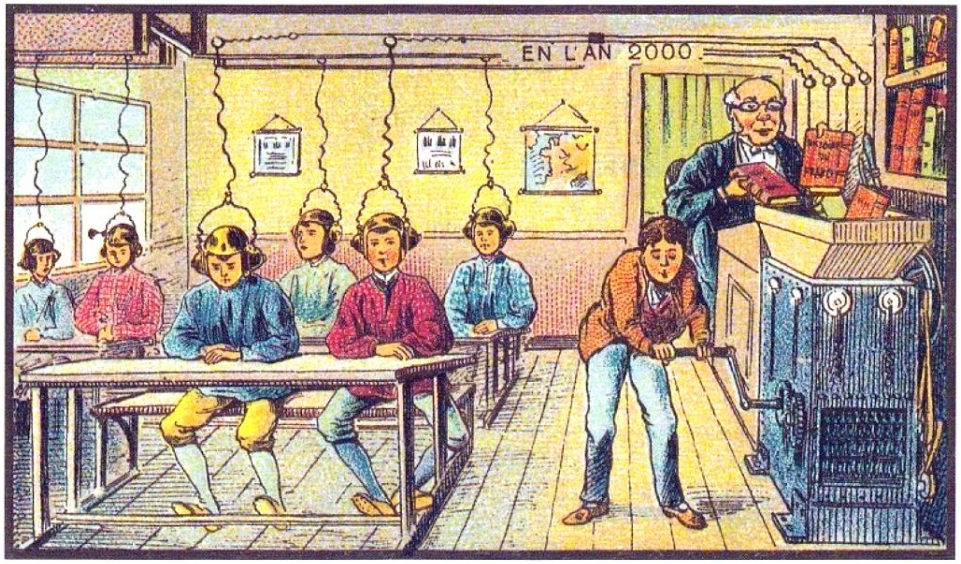
Wrong assumption. Yes, it's an ancient assumption. Yes, it's part of the conventional wisdom. Yes, it's the assumption driving the S & A reform effort. Yes, it's the mainstay of the textbook industry. Yes, it's the assumption that keeps the test-makers in business. Yes, it's the belief underlying bipartisan education reform efforts in Congress and state legislatures. But it's wrong.

What students need most, what we all need most if we're to make maximum use of our brains, is the clearest-possible understanding of the system we use for storing and retrieving what we know. Ignoring that need assures that most of our academic "stars" will continue to be not the most brilliant, not the most contemplative, not the most

creative, but simply those who happen to have the best short-term memories, memories that will see them through the next standardized test.

Education reform that works will recognize the brain's need for order and organization.

Education in the year 2000, as predicted in a French cartoon from a century earlier. ►



At School

[8]

Curricular problem Number Three: Function

What did you learn in school today, Johnny?"

"I learned that Mt. Everest is the tallest mountain in the world, that Shakespeare wrote Julius Caesar, and that Thomas Jefferson wrote the Emancipation Proclamation."

"Hmmm. Two out of three. Better pay closer attention tomorrow."

Conventional wisdom has it that kids learn most of what they know by sitting down, shutting up, facing front and paying attention to what they're being told or made to read. That, we've come to believe, is how we get smart.

Note our quantitative metaphors for educating. Lectures "transfer" information. Knowledge is "downloaded," "passed on," "handed down," "absorbed," "stored up." The material in textbooks is "covered." "Empty-headed" students "cram" for exams. Information is "pounded in," until students' heads are so "stuffed" it's "running out of their ears."

To appreciate the ubiquitousness of the idea that knowledge is some kind of "thing" with parts called "facts," consider the typical parent-child exchange about the day's experience at school. Study the increasingly popular "Core Knowledge" instructional materials assembled under the direction of E.D. Hirsch, Jr. and enthusiastically promoted by ex-U.S. Secretary of Education William Bennett, materials long on "fact sheets" and buttressed by the *What Your Kindergartner - Sixth Grader Needs to Know* series of books. Look at the sample questions in Ravitch and Finn's *What Do Our 17-Year-Olds Know?*, the book that did so much to kickstart the present standards and accountability reform program. ("When was the Civil War?" "Who is associated with the founding of settlement houses to help the poor?" "Which of the following was NOT addressed by New Deal legislation?").

The relevant question for American society isn't whether or not students should know the right answers to such questions. The question we should be asking is, "How do kids learn, really learn, learn in ways so powerful that what's learned becomes a working tool for making more sense of experience?" Is it mostly a matter of being told and remembering, or is another, less obvious process at work?

We lay in a crib and nothing much happened. We made a lot of noise and someone picked us up, changed our diaper, and gave us something to eat. We had discovered a relationship, and we were smarter.

We grow, and discover a complex relationship between the time of day, our father's mood, and the likelihood that we'll get a "yes" if we ask to borrow the car. We're smarter.

We become adults, go into various fields, and discover relationships between urban design and crime rates, between age and susceptibility to advertising, between emotions and physical health, between religious belief and reaction to social change, between certain additives and cleanness of a fuel burn, between climatic change and insurance rates, between technology and family stability and instability. We're smarter.

We learn a little from being bombarded with information. We learn a lot by discovering relationships between various parts of reality. We have a system of education that puts enormous emphasis on a comparatively minor way kids learn and pays little attention to the major way they learn.

The cost of that misplaced emphasis is far greater than we think, and the current simplistic "standards and accountability" reform movement is increasing those costs. In the real world, the world we're trying to help the young understand, everything connects to everything in a complex web of relationships. We want a pair of socks. Those available have been knitted in a Third World country. Power to run the knitting machines is supplied by burning fossil fuels. Burning fossil fuels contributes to global warming. Global warming alters weather patterns. Altered weather patterns trigger environmental catastrophes. Environmental catastrophes destroy infrastructure. Money spent for

infrastructure replacement isn't available for health care. Declines in the quality of health care effect mortality rates. Mortality is a matter of life and death. *Buying socks, then, is a matter of life and death.*

Making sense of this cause-effect sequence simply isn't possible when the tools brought to the task are traditional subjects and courses. There is in that sequence, information related to marketing, physics, chemistry, meteorology, economics, engineering, psychology, sociology, political science, and a couple of other fields not usually taught in school. Even in the highly unlikely event that students took all these subjects, and were able to remember each one over a period of years, it's the *relationships between them* that are critical to understanding. No subject or course systematically addresses such relationships.

There's no way under the sun that a series of facts can be strung together to capture the complexities of that sock-buying sequence. When we grasp the fact that ordinary experience is a vast web of such sequences simultaneously playing themselves out, we begin to understand just how misguided is our blind faith in traditional tell-them-and-test-them schooling, and how dangerous are the efforts to freeze that tradition in place by reinforcing it with simplistic standards and tests geared to those standards.

Education reform that works will recognize that the exploration of relationships, not the mental storing of facts, is what general education is all about.

[9]

Organizing chaos

Take another look at that sock-buying causal sequence: "We want a pair of socks. Those available have been knitted in a Third World country. Power to run the knitting machines is supplied by burning fossil fuels. Burning fossil fuels contributes to global warming. Global warming alters weather patterns. Altered weather patterns trigger environmental catastrophes. Environmental catastrophes destroy infrastructure. Money spent for infrastructure replacement isn't available for health care. Declines in the quality of health care affect mortality rates. Mortality is a matter of life and death."

An initial impression may be one of a complexity so overwhelming that most adolescents would have trouble just following it, much less assembling it from scratch themselves. And if the goal of schooling isn't just to understand that particular sequence

but to explore myriad similar slices of the real world, the teaching task may seem hopeless. After all, a significant number of students can barely read a newspaper or write a coherent note. If such networks of relationship are the stuff of which ordinary, daily experience is composed, if many such networks are far more complex than our example, if the networks are constantly evolving and changing, and if those which students will be confronting will be subject to forces that aren't yet apparent even to sophisticated futurists, how in the world is the general education challenge to be met?

Those who laid out the general outlines of today's curriculum a little more than a century ago had the right idea. They knew that reality in the form of ordinary experience was mind-bogglingly complex, and they knew it had to be organized to make it more manageable intellectually. What they didn't know was how to organize it in a way that would show that it was a "system." They gave us the disciplines, but as noted earlier, the disciplines aren't systemically related. Educators try to deal with the problem with interdisciplinary, multidisciplinary, transdisciplinary and cross-disciplinary studies, but those don't reveal the seamless, holistic nature of knowledge, and they don't lend themselves to scheduling.

Those who devised the present curriculum should be forgiven. Think "gravity" before Sir Isaac Newton and the reason will begin to be apparent. Everybody who ever lived before 1666 knew about gravity, they just didn't know what they knew. Newton made the familiar "strange enough to see." Those who shaped today's curriculum were too close to the most logical approach to organizing knowledge to see it.

We don't have to invent a better general education curriculum organizer. We already have one. Not only is the system truly a system, not only is it vastly superior to the organizer presently in use in our schools and colleges, not only does it honor the inherent, integrated nature of knowledge, not only does it mesh with how the brain handles information, the system has undergone thousands of years of testing and refinement. It's so simple that children master its basics long before they start to school, yet so sophisticated that it can (and does) organize the most esoteric research in the most esoteric fields.

There is, of course, that "gravity" catch, the one suggested by the old saying that a fish would be the last to discover water. The optimum organizer of general education is known and used by everyone, but the system is so familiar, so taken for granted, we don't even think about it.

The utterly familiar—the pictures on our walls, the hum of a fluorescent light, an ever-present smell—our senses shut out. Our basic organizer of knowledge is far more omnipresent than any of those (having been with us since infancy), making it even harder to discern.

But it's there, and once pointed out, it's obvious. Take apart the sock-buying example, take apart any such causal sequence, take apart any human experience

occurring anywhere in time and space, take apart, even, the immediate experience of reading this sentence, and it will be seen to have just five parts, the relationships of which make experience whatever it is.

Trying to make sense of experience—trying to describe or analyze it,

- We separate out from time's continuous flow a segment that encloses the experience we're thinking about—"right now," "last week," "before the turn of the century," "the next millennium," "2.75 seconds," "as soon as I'm finished," "The Dark Ages."
- We locate the experience in space. We say "it's next door," "on the other side of the railroad tracks," "in the jungle," "on the top shelf in the basement," "in The French Quarter," "far up the Amazon River," "in the particle accelerator."
- We identify the participant actor, actors, or objects—"just the two of us," "rebel forces," "your nephew," "Abraham Lincoln," "the amalgam," "private citizens," "angels."
- We describe the action—"went for a walk," "shut down the government," "exploded in anger," "planted the flag," "measure out three grams," "will die."
- We give (or assume) a cause of or reason for the action—"greed," "heard voices in his head," "out of generosity," "had delusions of grandeur," "filled with patriotic fervor," "excessive air pressure."
- We weave the five together. Their "systemness" is obvious from the fact that changing any one of the five changes the whole experience.

In short, trying to make sense of experience, we want to know when, where, who, what, and why, and how they fit together. *Those five familiar categories, not the traditional academic disciplines, are the primary and optimum organizers of general education, the raw material from which we all construct all thought, all language.* They're our "master mental organizing system." Geography, botany, economics, chemistry, all other academic disciplines being taught, all that ever will be taught, are bits and pieces—subsystems or secondary organizers—of this intuitively known master system.

A likely first reaction to this is, "You must be kidding! This is sophisticated? This is useful? This is a better system for organizing knowledge than zoology, astronomy, political science, physics, and the other familiar disciplines, subjects and courses?"

For purposes of general education, *absolutely!* Think of who, what, when, where, and why as I, II, III, IV, and V—the main headings in a vast outline of all knowledge. Think of A, B, and C, etc., 1, 2, and 3, etc., (a), (b), and (c) etc., as the "sub-organizers" of knowledge under I, II, III, IV, and IV.

Think of the five as academic disciplines, but as academic disciplines so related that, in a study of any one of them, the other four must constantly be taken into account. And know that together they comprise a whole much greater than the sum of the parts.

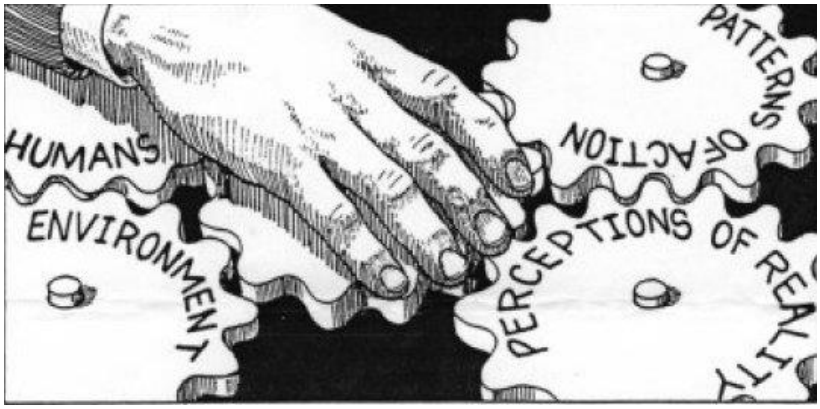
There are plenty of reasons why this is a better system for organizing general knowledge than the system our schools and universities are presently using. First, it's "natural," so natural we use it without having to think about it. It fits with how our brains work. Second, it's free of specialized jargon. Third, whereas the knowledge-organizing system now used in our schools is only a little over a century old, we've been using and refining our natural system since language was invented. Fourth, unlike the present organizer, this one doesn't have "holes" in it, doesn't neglect fields of knowledge which haven't managed thus far to wrangle a place in the curriculum. Fifth, it's such an efficient approach to general education it makes available free time for students to pursue specialized studies that capitalize on their interests and abilities. Sixth, acceptance of our everyday system for organizing knowledge builds into the curriculum an extremely important characteristic that's presently lacking—criteria for deciding what's more and what's less important to study.

Right now, what gets taught and what gets ignored have little or nothing to do with what it's important to know. What's in the curriculum is the product of custom, of turf battles, of campus politics, of competition for students and funds. But if decisions about what's more and what's less important are based on "systemic consequences," if decisions about what to teach are based on how much or how little effect a particular matter has on life as it's lived day to day, then logic replaces other curriculum organizing criteria. If it's a choice between, say, studying fresh water supplies or energy sources and studying Latin verb forms or quadratic equations, then asking which study would likely have the greatest impact on society for good or ill provides pretty solid guidance.

Finally, even if not a single one of the above six reasons for basing the curriculum on our natural approach to organizing knowledge is valid, a seventh reason makes it necessary. Since knowledge grows primarily by way of the exploration of relationships between parts of reality, artificial and arbitrary walls between those parts block intellectual growth and creativity at its source.

Learners s need an easily understood mental model of reality that encompasses, organizes systemically, and makes relatable, all knowledge past, present and future.

We need a massive "back to basics" reform movement—a movement built on our natural way of organizing thought and language.



[10]

What's worth learning?

"Learners need an easily understood mental model of reality that encompasses, organizes systemically, and makes all knowledge—past, present and future—relatable."

The knowledge-compartmentalizing math-science-language arts-social studies core curriculum doesn't do that, but it's been in near-universal use for so long it's difficult for many people to imagine an alternative. That humans were creating complex civilizations and ways of life thousands of years before the core curriculum was adopted by America's high schools testifies to humankind's intuitive ability to think and make sense.

Unfortunately, the wealth we invest in preparing to kill or in killing each other, the messes we create that we don't know how to clean up, our wholesale waste of human potential, poverty in the midst of plenty, our willingness to leave Earth in worse shape than we found it—all say that our ability to make *good* sense needs serious attention.

Doing something about that is schooling's role, but decade after decade, performance remains basically flat. We mostly do what we've always done—dump soon-forgotten secondhand information on the young, when anticipating and managing the consequences of environmental, demographic, technological and economic change and coping with the unexpected says that what learners most need is an enhanced ability to size up situations, anticipate possible and probable futures, and generate *new,* appropriate knowledge.

Schooling's challenge: Maximize learner ability to think clearly and productively.

To that end, experience has taught educators some basics, that (a) right-here, right now, firsthand, real-world experience is the best teacher, (b) that abstract ideas need to be introduced in concrete ways, (c) that learners need to feel they have some control over what they're doing, (d) that working and talking together in teams teaches,

(e) that in the big scheme of things, knowing that what one is doing matters, is important.

Fortunately, those basics cost nothing, not even the price of textbooks. There's no idea worth knowing, no principle in the physical or social sciences or the arts that can't be introduced directly and its study pursued within any school. Think of schools as *the* phenomenon to be understood. It's an equipped laboratory, the world in all its inherent complexity localized and "miniaturized," tangible, always accessible, important and emotionally involving even for those who hate it.

Every school sits on a geological foundation. It's oriented in a way that affects its energy use. It has a size and shape that can be described with mathematical precision. The exact nature and location of its internal features can be noted. The usual geographic distribution of its citizens and other demographic data can be mapped, quantified and represented graphically. The school's tools, technologies and infrastructure can be identified, described and analyzed. The habits and customs of its citizens can be traced; describing these actions puts challenging demands both on students' powers of observation and their ability to translate those observations into precise language. Formal and informal patterns for social control, for displaying status, for making decisions and for other activity can be traced and analyzed. Shared attitudes and assumptions—those that make it possible for the school to function (always present but almost never verbalized), can be identified and clarified and their possible origins discussed. Ethnic differences in the student population can be explored directly.

The pieces in place, questions can be raised about relationships among them. How, for example, are perceptions of the relative power of various individuals created or reinforced by the physical organization of the school? Of classroom furnishings? What are the bases for status within the school and within classes, and what are the costs and benefits of these bases? What kinds of leadership are exercised? In which situations? How do the attitudes and patterns of action change as various instructional tools and techniques are used? How are assumptions about self and others related to ways the school is organized and functions?

Other assignments can explore the dynamics of change: Alternative shapes, sizes, locations and furnishings for the school and for classrooms can be imagined and the possible consequences of each traced. Hypotheses can be generated about the probable and possible consequences of various technologies if they're available, of, say, networking desks, homes, libraries, schools, religious institutions, businesses and social service agencies. New tools for transport or for communicating can be imagined and their potential impacts on the school's physical form, demographics, student patterns of action and perceptions of reality considered.

Designing a comprehensive study of one's school and following through on it touches every aspect of meaningful learning. And if those in positions of authority are open to learner-generated insights and dialog as means to the end of continuously

improving the school, a near-static social institution can begin to realize its potential for maximizing humanness.

Schools must teach the young how to generate new knowledge.

[11]

Evaluation/Accountability

The root of the performance evaluation problem is relatively simple. Routine human functioning and civilized life are made possible by dozens of thought processes and countless combinations of thought processes—abstracting, adducing, aggregating, analyzing, anticipating, applying, articulating—just to begin a much longer list.

Schooling's major task is improving the quality of those dozens of thought processes, but determining quality requires judgment, and the standardized tests that produce the data that authorities insist must be used to set education policy are incapable of making value judgments.

An excerpt about evaluation from a 1971 publication my brother and I wrote at the request of Florida's Department of education, may help clarify the problem.[1]

> The question, "How do I evaluate?" (which translated, frequently means "How do I determine and defend my grades?") is easy or difficult depending upon what one is trying to evaluate. We usually make the task easy, but we do it by evaluating only one cognitive (thought) process: Recalling.
>
> But now we are saying we want students to think, and have begun to define more precisely what we mean by "thinking." Thinking means recalling, but it also means engaging in a full range of cognitive processes. Further, we want students to be able to apply these thought processes to real-world matters…
>
> How are we to know what students can do and how well they can do it? By making judgments about performance, by asking not "What do they know?" but "What can they do?" If we want to determine if students can draw inferences, we

[1] Marion Brady and Howard L. Brady, *A Rationale for Social Studies*, 1971, State Department of Education, Tallahassee, Florida, p. 66 (edited for clarity).

have to give them data and ask them to draw inferences. If we want to evaluate their ability to hypothesize, they must be asked to hypothesize, and so on.

Unfortunately, if we accept this expanded basis for evaluation, we are faced with new and difficult problems. When we ask students to recall, we base our evaluation on the quantity of information recalled. But when we ask them to hypothesize, infer, estimate, generalize, imagine, and so on, responses will differ both quantitatively and **qualitatively.** Do two good hypotheses equal four "fair" hypotheses and seven "poor" hypotheses? What *is* a "fair" hypothesis? A "poor" hypothesis?

There's no evading the issue. The more complex, sophisticated, and real-world the aim of instruction, the greater the difficulties of evaluation. Subjective judgments by the teacher are inevitable. *There are no simple criteria for evaluating the quality of student thought.* Consider the implications of that fact for class size, for dialog, for knowing at least a little something about the myriad factors that affect how learners think and act.

According to data from multiple Programme for International Student Assessment (PISA) studies, "…in most countries, academically able students do not hold their schooling in high regard."

How learners are evaluated suggests a reason. Normal, healthy humans enjoy intellectual challenge. Testing recall of secondhand information barely qualifies as intellectually challenging.

The evaluation challenge, then, is to write test questions or test activities that present students with situations, conditions or problems drawn from life and have them apply their descriptive and analytical skills to them.

Here's an example of a general education test question or activity that adolescents familiar with their system for organizing knowledge would find reasonable and doable:

In an article in Science News, Volume 34, page 142, Laura Bell wrote the following:

"Affectionately named N/R40-243, she achieved special distinction among the wood chip-lined cage of ordinary C3B1ORF mice. While other mice were eating as much as they pleased and living to the ripe old age (for mice, at least) of 30 months, N/R40-243 was among those given 60% less Purina Lab Chow. The reduction extended her life to 54.6 months, making her possibly the oldest mouse ever known."

(a) Compute the average life expectancy of humans if the effects of a reduced human diet were comparable to those in the experimental mouse.

(b) Given this change in life expectancy, predict important, possible consequences for America.

Creating knowledge, not remembering it, is central to survival. Tomorrow's problems can't be solved with today's solutions.

[12]

Reform. Real reform. A summary

It's not a people problem that's causing education's headaches. Sure, it's possible to bribe or browbeat kids and teachers sufficiently to bring about changes in behavior, but the changes will be temporary, and come with devastating long-term costs.

No, it isn't a people problem but three very specific system problems that keep schools—public, parochial, private, charter, home, whatever—from realizing their potential.

General education needs (1) an aim, (2) a system for organizing knowledge that reflects the holistic, systemically integrated nature of knowledge, and (3) a curriculum that respects how the human brain works. If we adopt as the aim of educating helping students lift into consciousness, refine, and make deliberate use of their implicitly known system for processing information—for selecting, organizing, integrating, evaluating and synthesizing it—all three needs are met.

Three problems, one solution. Get back to the real basics, base the general education curriculum on our ancient, natural organizer of experience, and not only will the whole institution be revitalized, student performance will move to a presently undreamed of level.

Guaranteed.

[13]

Doing it

Unfortunately, making reason rather than a ritual the shaper of the general education curriculum will require leadership, and neither inside nor outside the institutional structure of schools is that leadership ordinarily found.

Teachers are trained in particular disciplines. They have no responsibility for the whole of the curriculum, little time to sit and reason together about the larger effort of which their specializations are parts, and no authority to make changes in the curriculum even if they decided that doing so was a good idea.

Administrators, within bureaucratic limits, have some responsibility for the whole of the curriculum, but having come up through "the system," they're just as likely as teachers to think that a random mix of subjects and courses provides an adequate general education.

State legislators and executives are the prime movers of the curriculum (sometimes with federal prodding), but in matters educational they're rarely any more insightful than anyone else. Maybe, considering the size and weight of the bureaucracies they oversee, they're even more bound to the status quo than are others.

The media could play a reform role, but they tend to focus on gimmickry, novelty, and strategies that can be summarized in an editorial or a film clip.

So we stay mired in the status quo. The views of many observers notwithstanding, schooling in America has changed little in more than a century. Put most of today's kids into pre-World War I classrooms, give them a few minutes to get used to the styles of dress and the furnishings, and they'd feel so at home they'd raise their hands and ask if what the teacher was saying was going to be on the next test. We're doing what we've always done, and each passing decade reinforces the assumption that there's no alternative to the curricular status quo, that the only way to improve student performance is to try harder.

There are alternatives. But they aren't going to be pursued as long as the Simplisticos and the Standardistos—the one-size-fits-all standards and accountability people—use their bully pulpits and the taxpayers' money to consolidate their stranglehold on the system.

The first step on the reform road must be recognition at the state and national levels that what are now called "core courses" are merely customary courses, not "core knowledge." No mix of specialized or discipline-based studies ever has or ever will provide an adequate general education. It must be understood that instruction designed to lead to a true general education—an education that respects the inherent complexity

of humanness—will be best served by having its own slot in the curriculum from at least the upper elementary to the end of the secondary level of schooling.

Making fundamental changes in education is hard. Really hard. Someone once said that it's about like trying to move a Jell-O elephant. Maybe it can't be done. But if it can be done, it'll almost certainly start with those strong and thoughtful students, parents, and others who believe in standards and accountability but realize that not all standards and not all measures of accountability are created equal, that poor ones can protect and reinforce poor notions of educating even more easily than good standards and measures of accountability can bring genuine educational progress.

It'll be their recognition of the superficiality of the thinking of those who're now waving the standards and accountability banner, their forming of resistance and protest committees, their boycotts of high-stakes tests that emphasize skill in symbol manipulation to the neglect of all other dimensions of the intellect, their letters to editors, their pressure on state and national politicians, their messages from voting booths, that will begin to convince those in high profile leadership positions that sticking with the status quo will be, in the words of Buckminster Fuller, "the undoing of the society."

Act.

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Note: Some time ago, my brother and I acquired the copyrights to materials we'd authored that were published earlier by Prentice-Hall, SUNY Press and others. Appalled by the education institution's lack of progress, we edited these materials, and we put everything on line, free of cost or other strings.

I continue to believe what I concluded decades ago while teaching at Florida State University, that standardized testing has locked in the 1893 core curriculum and is blocking progress. I believe that the "opt out" movement offers the quickest route to correct that problem. However, remarkable response to our free instructional material has changed my mind about the possibility of change. In the years since we put them online, unadvertised, downloads of our instructional materials illustrating the potential of systems theory to radically improve the general education curriculum and academic performance have steadily increased.

I now think that repurposed traditional core curriculum content, consistent with and illustrating the ideas outlined in the Primer, introduced to adolescents by teachers who choose to do so voluntarily, in schools free of the pressure of covering standardized content in standardized ways, will prove its merit, eventually replace the core, revitalize the institution, and produce a citizenry capable of saving itself.

Links to free materials:

(a) EBook, *What's Worth Learning?*
http://www.marionbrady.com/documents/WWL.pdf

(b) Systems-based course of study:
http://www.marionbrady.com/IntroductiontoSystems.asp

(c) American history:
http://www.marionbrady.com/AHH.asp

(d) World history:
http://www.marionbrady.com/WorldHistory.asp

(e) World cultures:
http://www.marionbrady.com/InvestigatingWorldCultures.asp