
We Have Met the System — And It Is Us!

The transformation of education, Mr. Rhodes argues, must take place first in education's true workplace — the minds of its decision makers.

BY LEWIS A. RHODES

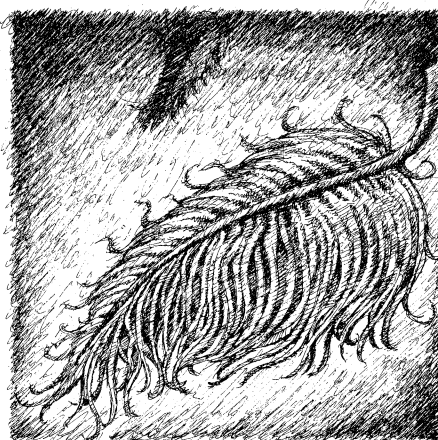
IF EDUCATION IS a “system,” what drives it? What is the source of the energy that sustains its operation regardless of financial resources, teacher competency, or class size?

The energy of an educational system comes from two fundamental drives. First, a common concern for children focuses and aligns the actions of *all* who make up the system. Then, as with alternating current, the direction of the energy shifts, as each concerned party seeks to know whether its actions have had the desired effects.

Once outside the classroom, it becomes even more difficult to see the connections between ends and means. As Lewis Perelman notes, it seems that everything is connected to everything else. Frustration soon builds, invariably followed by seemingly logical calls to change, reform, restructure, or transform *everything*.

Perelman's book, *Technology and Transformation of Schools* (from which his article in this *Kappan* is adapted), fits that model. The strength of his argument

LEWIS A. RHODES (*University of Maryland Chapter*) is associate executive director, *Instructional Leadership and Technology*, with the *American Association of School Administrators*, Arlington, Va. Portions of this article are adapted from *To Support the Learner*, a future publication of the U.S. Department of Education, Office of Educational Research and Improvement.



lies in its view of the schools as a social, ecological system — that is, a system of people, playing interrelated roles, who strive over time toward relatively common ends. Moreover, he acknowledges that approximately 80% of the potential productivity gains in education can be achieved through changes in the relationships connecting the people.

The weakness of Perelman's argument (one which he shares with other “total change” theorists) is the apparent belief that the desired “system,” with all its parts in place, will be a product that appears at the end of a directed process of change, reform, or innovation. This expectation (along with a realization of the duration and costs of the tasks involved) adds to the frustration of the “system” thinker and usually leads to blaming educators for being resistant to change.

But what if the basic components of that system already existed? What if the basic relationships that connected “everything to everything else” were essentially in place, but functioning so poorly that many practitioners had to achieve the organization's purposes in isolation — one teacher to a classroom, one principal to a building, one superintendent to a district?

Moreover, what if schools are like trains that have to be converted from steam power to diesel power while they are under way? Or, avoiding metaphors, what if schools cannot be “stopped” while they are being rebuilt, reformed, or replaced? What if, like all other ecological systems in the world, total changes in schools could evolve only as the product of small changes in the ways the system achieves its daily purposes?

If these hypotheses are closer to reality — if we already have the “system” and need a process to help it grow daily toward increased effectiveness — there might be another option for those concerned with modifying educational systems. A model of this option can be found in the ways Copernicus and Galileo asked society to look at reality from a wholly different perspective. All one had to do was change one fundamental belief (that the earth was the center of the universe), and suddenly “new” relationships could be seen that better explained why things happened and that could be used to extend knowledge in new directions.

Such a complete transformation is the only kind of change that produces apparently “instantaneous” change, without time-consuming evolutionary processes. What it takes to make such a quantum leap is everyone's acceptance of a new or different fundamental belief, which can then serve as a reference point for a different perspective. And that's the prob-

lem! Beliefs don't change easily. Just ask Copernicus and Galileo.

In the case of schooling, the fundamental belief that would have to change is one that has contributed to three decades of failed experiments and change efforts, with and without technology. The belief can be found in Perelman's premise that education is the only business in which the consumer (i.e., the student) rather than the worker (i.e., teachers, principals, etc.) does most of the work. In other businesses, technology is designed to increase the worker's productivity. But education is concerned primarily with the productivity of the consumer, Perelman says.

How did education arrive at the point where the work performed by its paid professional workers has become so invisible that productivity gains are not seen as resulting from increases in their effectiveness? Is it any wonder that, when technology is provided to schools, the tools are given to the system's customers — the students — rather than its workers?

Two factors may have contributed to the student-as-worker perspective. First, that common concern for helping children that unites teachers, administrators, and policy makers into a "school system" may have blinded us to the nature of the work involved and especially to the interrelatedness and interdependence of the workers. Second, as first-generation tool users, most school practitioners may not have experienced computers — or even television — as *personal* tools. Because of the uses to which they are put in a mass society, these technologies are perceived more as devices for presenting information than as potential solutions to problems. (This one-sided view has been broadened outside of education, once the workers themselves have discovered how a tool contributes to their personal effectiveness.)

Technology is, of course, a valuable tool for presenting information. But its potential for problem solving has gone largely untapped. In a world of information, information technologies can provide tools for transformation that can:

- empower individuals who are increasingly frustrated by their lack of control over their own job destinies;
- connect peers for problem-solving exchanges;
- provide access to information and other resources at the point and time needed; and
- facilitate tradeoffs among the non-

human variables in schooling to allow the people in schools to make better use of their unique attributes.

For technology to fulfill its potential, however, we must change our views about work in the schools. The following two sections offer a framework for viewing that work, the potential roles for technology, and the efforts (past and future) to introduce technology in the schools.

From that perspective, we might then see technology used *for* the workers (to improve connections, so that each part of the system can function more effectively) and *by* the workers (to enhance and extend their personal effectiveness). Technology for teachers will change technology use by teachers and will give teachers the personal satisfaction of knowing that technology is helping them influence our shared educational goals.

THE NATURE OF WORK

Just as Marshall McLuhan's fish could not perceive water, so we are largely unaware of information, the medium in which we work, draw sustenance, and "swim" through life. As living beings, we are continuously processing information. Each of our decisions and actions is based on some form of information that we have taken in and chosen to act upon.

Within this information context, the common work of education can be described as decision making and, in particular, a special, dynamic, and complex form called situational decision making. For example, in controlled situations in which most factors remain constant and can be anticipated, decision making is rational and relatively simple. But when one must quickly respond to multiple, changing, and often unanticipated conditions (as in the daily situations faced by teachers and administrators), the nature of decision making changes. There is no single right decision, only a "best" decision for the situation, based on the information available at a given time and place.

The nature of the fundamental work of education, therefore, is responsive, situational decision making. This view is supported by research that suggests that effective teachers, principals, and superintendents function much as ships' captains do — staying constantly alert for the unanticipated; monitoring their expectations for the unexpected; and making progress by a series of small deci-

sions, each based on the results of previous ones.

As with ships' captains, the success of effective school practitioners depends on constant awareness and on quickly accessible information: some stored in the form of experiences and procedures that have worked in the past; some in the form of information that will allow them to try new strategies (e.g., information about their own capabilities or about the characteristics of the situation itself); and, most important, information about the purpose of their efforts. The research of David Berliner and others suggests that the way in which administrators and teachers take in and process information continues to be the single variable most strongly associated with effective educational leadership.

If the common work of education is decision making, then the workplace of education is the minds of professional educators. In that case, schools may be effective to the extent that they provide that workplace with access to information — when and where it is needed — to make appropriate and responsive decisions.

Although Perelman notes that we need not look to the business world to learn how to run the business of schooling, we might find an interesting model (and one with direct implications for schools) in the "quality" revolution in Japan since World War II. The success of Japanese industry can be attributed to — among other factors — its acceptance of the premise of American psychologist Edwin Deming that the quality of a "product" is directly influenced by the frequency of informed interaction between a caring worker and that product.

This appears to be a common-sense observation: the more a sculptor interacts with clay, a factory worker with a car, a teacher with a child, the more opportunities there are to self-correct, to catch errors, and to make changes. The Japanese, however, took this common-sense observation as a fundamental belief. If this is, in fact, "the way things are," then management had better provide something in the workers' environment that informs their decisions.

Deming helped them construct two such mechanisms. One — the quality circle — facilitates the generation and exchange of information, allowing the individual worker to tap into the experiences and perspectives of others. The second — feedback data (sometimes

called “statistical process controls” or “work measurement data”) – provides individual workers with information about the effects of their actions while there is still time to do something about them. This self-corrective capability has made it possible for Japanese industry to establish and maintain zero-defect policies.

Contrast this approach to what, in the past, has been American industry’s willingness to wait until the end of the assembly line to apply tests of quality. By then, it is frequently too late or too expensive to correct a problem. American schools do the same thing when they try to maintain “quality” with end-of-year standardized tests.

Fortunately, American business managers are learning that information is their primary resource for empowering their workers. Information is to be gathered, shared, and made accessible to those closest to the making of the product, who must use it for their decisions.

But what about education? Does this new “industrial” model have implications for schools? What if we were to accept Deming’s premise and believe that the quality of a student’s learning is strongly influenced by the frequency of informed interaction with a caring teacher? What if we were to believe that the work of school practitioners is a continuous process of making the “best” decisions for the children they teach? What might we do then to inform the decisions that underlie that interaction? And what roles could information technology play?

Answers to these questions may come from reflecting on the information that orients, nurtures, and limits our own decisions. Were we to look across a number of our conscious and unconscious decisions, we could derive the purposes, goals, missions, and objectives that provide our sense of meaning. We could consider the culture or climate of the school, which limits our decisions by telling us what is acceptable. And we could examine the effects of previous experiences, probably the most valuable information we have. Unfortunately, as isolated practitioners, few of us have had frequent enough access to these data.

It is not surprising that effective school leaders are experimenting with ways to help practitioners gather information through such techniques as collegial planning, reflective practice, classroom coaching, mentoring, visioning, strategic planning, and culture building. All are

designed to help decision makers learn from their own experiences, to orient and align their decisions to those of others in the organization, to break down the invisible limits on what is perceived as acceptable and possible, and to facilitate self-correction.

LOOKING BACK

If we have not understood the nature of the work of the tool user whose daily decisions create the experience of schooling, is it any wonder that we haven’t been able to understand how technology relates to that experience? When the work of schools is perceived as presenting information to students, technologies are seen primarily as alternative systems for delivering that information.

Over the past 30 years, technology has been used effectively in some situations in education, but we have often lacked the perspective to allow us to recognize the actual consequences for the user. Because organizations are groups of purposeful, psychological beings linked temporarily to accomplish a mutual organizational purpose, any tool should contribute to the individual worker’s sense of purpose and accomplishment even as it is being used to achieve the organization’s purposes. A failure to acknowledge this consequence has helped to limit the use of technology in the schoolhouse until now.

Had we looked at technology in the schools from this psychological/sociological perspective, we might also have seen that the *process* required to introduce each new technology was an important *product*, as well. The implementation processes typically brought people together to plan in a way that allowed them to question heretofore unquestioned organizational regularities. The processes provided them with evidence of tangible results for use in problem solving when things didn’t work as planned. In other words, people in the schools had some influence over their own work environment. Unfortunately, that influence usually ended when the technological innovation was securely “in place.”

Had we viewed technology in the schools from our new perspective, we might have understood why effective uses of technology were due less to what the technology did than to what it allowed the teacher/user to do. Motivation and training were seldom problems because the payoff in personal effectiveness made it

worthwhile for teachers to invest considerable time and energy in rethinking what they did, how they did it, and, in many cases, why.

Finally, taking this perspective might have allowed us to see more clearly that our training and dissemination efforts were oriented in the wrong direction. The traditional top-down approach makes little sense if the learning of a new skill or procedure requires that people have time for practice in a risk-free environment, that they receive feedback and support for trial and error, and that they be allowed to talk to peers who are facing the same experiences.

LOOKING FORWARD

Will technology transform education? No. That transformation must take place first in education’s true workplace – the minds of its decision makers. It requires a shift in focus from what technology is or does to what it enables educators to do.

We can facilitate this transformation by providing ways to explore, simultaneously, improvements in personal and organizational effectiveness. Tying technology to other efforts to improve schools can allow a systematic exploration of technology’s potentials in the context of daily practice – a discovery process that will allow school staffs to connect their firsthand knowledge of the barriers to effective instruction and learning with the potentials and possibilities offered by new tools.

Participants in this process can discover how to use technology strategically to increase school and staff effectiveness – helping staff members to share experiences and resources and to solve problems. Although this process seems to focus on the staff members, the ultimate beneficiary is the student – for the experience of learning to use a tool for one’s own purpose provides a most effective means of understanding how others might also use it.

This approach may bear little resemblance to “traditional” notions of educational technology, but it addresses the issues that have hampered the effective integration of technology into the work of schooling for the past 30 years. It can allow the workers in our schools – those whose daily decisions most affect the quality of our “product” – to develop the awareness necessary to answer for themselves the question: “How can we be more effective?” 