

## MAKING AMERICA SMARTER

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Standards, tests, and accountability programs are today's favored tools for raising overall academic achievement. Testing policies are also meant to increase equity, to give poor and minority students a fairer chance by making expectations clear and providing instruction geared to them. In practice, though, it is proving hard to meet the twin goals of equity and higher achievement. This is because our schools are trapped in a set of beliefs about the nature of ability and aptitude that makes it hard to evoke effective academic effort from students and educators.

What we learn is a function of both our aptitudes for particular kinds of learning and the effort we put forth. Americans mostly assume that aptitude largely determines what people can learn in school, although they allow that hard work can compensate for lower doses of innate intelligence. Our schools are largely organized around this belief. IQ tests or their surrogates are used to determine who has access to enriched programs. As a result, some students never get the chance to study a high-demand, high-expectation curriculum.

Traditional achievement tests are normed to compare students against one another rather than against a standard of excellence. This approach makes it difficult to see the results of learning and thereby discourages effort. (If one is going to stay at about the same relative percentile rank no matter how much one has learned, what is the point of trying hard?) Similarly, college entrance depends heavily on aptitude-like tests that have little to do with the curriculum studied. Like IQ tests, they are designed to spread the student population out on a statistical scale rather than to define what any particular individual has learned.

These commonplace features of the American educational landscape are institutionalized expressions of a persistent belief in the importance of inherited aptitude. The system they are part of is self-sustaining. Assumptions about aptitude are continually reinforced by the results of practices based on those assumptions. Students who are held to low expectations do not try to break through that barrier, because they accept the judgment that inborn aptitude matters most and that they have not inherited enough of that capacity. Not surprisingly, their performance remains low. Children who have not been taught a demanding, challenging, thinking curriculum do poorly on tests of reasoning or problem-solving, confirming many people's original suspicions that they lack the talent for high-level thinking.

Two converging lines of research--one from cognitive science, one from social psychology--now give us reason to believe that we don't have to continue in this way. We don't need to pit excellence against equity. We can harness effort to create ability and build a smarter America.

### **Intelligence-in-Practice: Habits of Mind**

For more than 20 years, psychologists and other students of the human mind have been experimenting with ways of teaching the cognitive skills associated with intelligence. These include techniques as varied as generating analogies, making logical deductions, creating and using memory aids, and monitoring one's own state of knowledge (*metacognition*). Early experiments on teaching specific, isolated components of intelligence yielded a common pattern of results: Most of the training was successful in producing immediate gains in performance, but people typically ceased using the cognitive techniques they had been taught as soon as the specific conditions of training were removed. In other words, they became *capable* of performing whatever skill was taught, but they acquired no general *habit* of using it or capacity to judge for themselves when it was useful.

As a result of these findings, cognitive researchers began to shift their attention to educational strategies that immerse students in demanding, long-term intellectual environments. Now, positive results are coming in. In experimental programs and in practical school reforms, we are seeing that students who, over an extended period of time are treated *as if* they are intelligent, actually become so. If they are taught demanding content, and are expected to explain and find connections as well as memorize and repeat, they learn more and learn more quickly. They think of themselves as learners. They are able to bounce back in the face of short-term failures.

This experience is giving rise to a new conceptualization of intelligence-in-practice: Intelligence is the habit of persistently trying to understand things and make them function better. Intelligence is working to figure things out, varying strategies until a workable solution is found. Intelligence is knowing what one does (and doesn't) know, seeking information and organizing that information so that it makes sense and can be remembered. In short, one's intelligence is the sum of one's *habits of mind*.

### **Being Smart and Getting Smart: Two Popular Beliefs About Intelligence**

Here is where the research by social psychologists comes in. Two decades of studies have shown that what people believe about the nature of talent and intelligence--about what accounts for success and failure--is closely related to the amount and kind of effort they put forth in situations of learning or problem-solving.

Some people believe that intelligence and other forms of talent are fixed and unchangeable. Intelligence is a thing, an entity that is displayed in one's performance. Doing well means that one has ability; doing poorly means that one doesn't. According to this belief, people who are very talented perform easily; they don't need to work hard to do well. Hence, if you want to appear to *be smart*, you should not appear to be working very hard. Any educator working with adolescents knows how this belief can drive some students away from schoolwork.

Other people believe that intelligence is something that develops and grows. These people view ability as a repertoire of skills that is continuously expandable through one's efforts. Intelligence is incremental. People can *get smart*. When people think this way, they tend to invest energy to learn something new or to increase their understanding and mastery.

But it is not just brute effort that distinguishes these learners from people who think of intelligence as an entity. Incremental thinkers are particularly likely to apply self-regulatory, metacognitive skills when they encounter task difficulties, to focus on analyzing the task and generating alternative strategies. Most important, they seek out opportunities to hone their skills and knowledge, treating task difficulty (and thus occasional setbacks) as part of the learning challenge rather than as evidence that they lack intelligence. They get on an upward spiral in which their intelligence is actually increasing. Meanwhile, their peers who think of intelligence as fixed try to avoid difficult tasks for fear of displaying their lack of intelligence. They enter a downward spiral by avoiding the very occasions in which they could learn smarter ways of behaving.

### **Effort-Based Education and Learnable Intelligence: Principles for Teaching and Learning**

The good news is that people's beliefs about intelligence aren't immutable. They respond to the situations in which people find themselves. This means that it is possible to help students develop learning-oriented goals and an incremental view of intelligence and thus set them on the upward spiral by which they can become smarter and deliver the kinds of high-level academic achievement everyone is hoping for. To do this, we need to create effort-based schools in which academic rigor and a thinking curriculum permeate the school day for every student.

For several years, the Institute for Learning at the University of Pittsburgh has been working with school systems across the country to set students--and whole school faculties--on the upward, getting-smarter spiral. A core set of principles guides this work, principles that educators have found both inspiring and practical. These principles, which can be illustrated in multiple examples

of specific school and classroom practice, are based on cognitive research and research on learning organizations. Here they are in a nutshell:

- **Organize for Effort**

An effort-based school replaces the assumption that aptitude determines what and how much students learn with the assumption that sustained and directed effort can yield high achievement for all students. Everything is organized to evoke and support this effort. High minimum standards are set, and all students' curriculum is geared to these standards. Some students will need extra time and expert instruction to meet these expectations. Providing that time and expertise helps send the message that effort is expected and that tough problems yield to sustained work.

- **Clear Expectations**

If we expect all students to learn at high levels, then we need to define what we expect students to learn. These expectations need to be clear--to school professionals, to parents, to the community, and, above all, to students themselves. With visible accomplishment targets to aim toward at each stage of learning, students can participate in evaluating their own work and setting goals for their own effort.

- **Recognition of Accomplishment**

Clear recognition of authentic accomplishment is a hallmark of an effort-based school. This recognition can take the form of celebrations of work that meets standards or intermediate expectations. It can also be tied to opportunity to participate in events that matter to students and their families. Progress points should be articulated so that, regardless of their entering abilities, all students meet real accomplishment criteria often enough to be recognized frequently.

- **Fair and Credible Evaluations**

Long-term effort by students calls for assessment practices that students find fair. Most importantly, tests, exams, and classroom assessments must be aligned to the standards and the curriculum being studied. Fair assessment also means using tests and exams that are graded against absolute standards rather than on a curve, so students can clearly see the results of their learning efforts.

- **Academic Rigor in a Thinking Curriculum**

Thinking and problem-solving will be the "new basics" of the 21st century, but the common idea that we can teach thinking without a solid foundation of knowledge must be abandoned. So must the idea that we can teach knowledge

without engaging students in thinking. Knowledge and thinking must be intimately joined. This implies a curriculum organized around major concepts in each discipline that students are expected to know deeply. Teaching must engage students in active reasoning about these concepts. In every subject, at every grade level, the curriculum must include commitment to a knowledge core, high thinking demand, and active use of knowledge.

- **Accountable Talk**

Talking with others about ideas and work is fundamental to learning. But not all talk sustains learning or creates intelligence. For classroom talk to promote learning, it must have certain characteristics that make it *accountable*. Accountable talk seriously responds to and further develops what others in the group have said. It puts forth and demands knowledge that is accurate and relevant to the issue under discussion. Accountable talk uses evidence in ways appropriate to the discipline (for example, proofs in mathematics, data from investigations in science, textual details in literature, documentary sources in history). Finally, it follows established norms of good reasoning. Accountable talk sharpens students' thinking by reinforcing their ability to use knowledge appropriately. As such, it helps develop the skills and the habits of mind that constitute intelligence-in-practice. Teachers can intentionally create the norms and skills of accountable talk in their classrooms.

- **Socializing Intelligence**

Intelligent habits of mind are learned through the daily expectations placed on the learner. By calling on students to use the skills of intelligent thinking and accountable talk, and by holding them responsible for doing so, educators can "teach" intelligence. This is what teachers normally do with students they expect much from; it should be standard practice with all students.

- **Learning as Apprenticeship**

For many centuries, most people learned by working alongside an expert who modeled skilled practice and guided novices as they created authentic products or performances. This kind of apprenticeship learning allowed learners to acquire the complex interdisciplinary knowledge, practical abilities, and appropriate forms of social behavior that went with high levels of skilled performance. Learners were motivated to do the hard work that was involved by the value placed on their products by people who bought objects, attended performances, or requested that important community work be done. Much of the power of apprenticeship learning can be brought into schooling through appropriate use of extended projects and presentations, and by organizing learning environments so that complex thinking and production are modeled and analyzed.

As we approach a new century, it is increasingly evident that the educational methods we have been using for the past 70 years no longer suffice. They are based on scientific assumptions about the nature of knowledge, the learning process, and differential aptitude for learning that have been eclipsed by new discoveries. Yet changing them has been slow because the nature of educational reform in this country is largely one of tinkering with institutional arrangements. Rarely has reform penetrated the "educational core."

But now that is happening. With the movement for standards-based education, America has begun to explore the potential of designing policy structures explicitly to link testing, curriculum, textbooks, teacher training, and accountability with clearly articulated ideas about what should be taught and what students should be expected to learn. Our hopes for breaking this century's pattern of disappointing cycles of reform--and of enabling our children to function effectively in a complex new century--rest with this vision of creating effort-based systems grounded in knowledge-based constructivism--systems that allow all students to reach high standards of achievement.

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