

## An Inherited Education System

The Principles of Learning are about creating intelligence by teaching in ways that foster learning-oriented goals, and by organizing our schools in ways that promote effort. Unfortunately, the system we have inherited operates on a different belief system. Our schools today largely function as if we believed that native ability is the primary determinant in learning, that the "bell curve" of IQ is a natural phenomenon that must necessarily be reproduced in all learning, and that effort counts for little. Consider the following examples:

- ◆ IQ tests or their surrogates are used to determine who will have access to the enriched programs for the "gifted and talented." This curriculum is denied to other students who are judged less capable.
- ◆ Our so-called "achievement tests" are normed to compare students with one another rather than with a standard of excellence. This makes it difficult to see the results of learning and actively discourages effort: One stays at about the same relative percentile rank, even if one has learned a lot, so why try hard?
- ◆ We group students, sometimes within classrooms, and provide, *de facto*, different curricula to different groups. As a result, some students never get the chance to study a high-demand, high-expectation curriculum.
- ◆ College entrance is heavily dependent on tests that have little to do with the curriculum studied and that are designed--like IQ tests--to spread students out on a scale rather than to define what one is supposed to work at learning.
- ◆ Remedial instruction is offered in "pullout" classes, so that students who need extra instruction miss some of the regular learning opportunities.
- ◆ We expect teachers to grade on a curve. If everyone gets an A or B, we assume that standards are too low, not considering the possibility that everyone may have worked hard and succeeded in learning what was taught.

These are commonplace assumptions of the American educational landscape. They are institutionalized expressions of a belief in the importance of aptitude. These practices are far more powerful than what we might *say* about effort and aptitude, because their routine, largely unquestioned use continues to create evidence that confirms aptitude-based thinking.

Schools provide roughly equal instructional time to all students: A certain number of hours per day, days per year, and years of schooling are everyone's right and obligation. As much instruction and learning as can be fitted into that time is offered. Then, at the end of the prescribed period of study, some kind of evaluation takes place. Students spread themselves out on those evaluations, and the spread of results confirms the aptitude assumptions of American schooling.

Students do not try to break through the barrier of low expectations because they, like their teachers and parents, often accept the judgment that aptitude matters most and that they do not have the right kinds of aptitude. Not surprisingly, their performance remains low. Children who have not been taught a demanding, challenging thinking curriculum do not perform well on tests of reasoning or problem solving, confirming original suspicions that they did not have the talent for that kind of thinking. The system is self-sustaining, with hidden assumptions continually reinforced by the inevitable results of practices that are based on those assumptions. Aptitude is not the only possible basis for organizing schools. Educational institutions could be built around the alternative assumption that effort actually creates ability, that patterns of who tries hard can directly influence ultimate patterns of competence in society. If we worked from an effort, rather than an aptitude, assumption, our education system would be designed primarily to foster effort.

## The Principles of Learning

The Principles of Learning are drawn from twenty years of research across fields. Lauren Resnick of the Learning and Development Center and co-director of New Standards proposed the Principles of Learning as a guide for shaping our educational institutions and classroom learning environments in a way that enables all students to learn and achieve the same high, rigorous standards. First, these principles provide schools with guidelines for organizing learning and instructional environments. They serve to break the grip of the old assumption that inherited ability places a ceiling on what a student can learn. Next, they describe conditions that will help all students to "get smarter". Finally, these principles guide schools in establishing the kinds of curriculum and pedagogy that would ensure achievement of rigorous academic standards by all students.

### Socializing Intelligence

Based on the convergent findings of motivational and cognitive research, we can now sketch out a definition of intelligence that is quite different from the traditional bell-curve notion of a fixed neural capacity to efficiently process information. This new understanding of intelligence encompasses beliefs, skills, and dispositions.

Much more than a collection of bits of knowledge and quick reasoning tricks, intelligence combines:

- ❖ a set of beliefs about oneself--one's right and obligation to understand and make sense of the world, and one's capacity to figure things out over time
- ❖ a set of problem-solving and reasoning capabilities--both a toolkit of cognitive strategies and the social skills of knowing how and when to get help
- ❖ the disposition to use the skills of intelligent thinking regularly.

This kind of intelligence is eminently learnable through the daily expectations placed on the learner. By calling on students to use their knowledge and thinking skills 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.

### **Beliefs**

- I have the right and obligation to understand things and make them work.
- Problems can be analyzed and I am capable of that analysis

Intelligence includes two kinds of beliefs. The first is believing one has the right and the obligation to understand things and make them work better. Not people in general, but specifically *I* have this right and obligation. I have the right to know what is going on around me, to understand why a particular thing is being asked of me, to understand why things are done the way they are, to understand why numbers function the way they do, why the characters in a book behave as they do, why an author chose particular words or ideas. I have the *right* to understand those things, which means I have the right to ask questions about them, to "push back" at my learning environment, not just receive information passively. I also have the *obligation* to do these things. As a member of my family, my community, and my school, part of my job is to understand things--both intellectual and social--and make them work better.

The second kind of belief is about how problems get solved. I am smart if I believe that problems get solved through analysis and work, as opposed to the right answers jumping into my head, and that I am one of the people whose analysis can make that happen. It is not enough for me to believe that *someone* can do it. I have to believe that *I* can do it.

### **Skills**

- A toolkit of problem analysis skills (metacognitive strategies) and good intuition about when to use them

- Knowing how to ask questions, seek help, and get enough information to solve problems

Intelligence also features two kinds of skill and knowledge. Most of the work of cognitive theorists has focused on skills and cognitive strategies that are directly teachable: ways of memorizing, ways of using resources, a repertoire of smart things to do in reasoning, problem-solving, and decision-making. These constitute a kind of metacognitive toolkit that includes both problem-solving strategies and good intuitions about when to use them.

Intelligent people also have a social toolkit: They know how and when to ask questions, when it is okay to get somebody else to help them, and when it is appropriate to struggle through on their own for a while first. They also know how to help others: how to ask thought-provoking questions or give people useful feedback without doing the work for them. People with well-stocked social toolkits are able to participate productively in learning communities where ideas are actively debated by students and teachers. They contribute to group tasks in ways that assist both themselves and others to build competence. They can receive, evaluate, and adapt to feedback and guidance.

### ***Disposition***

- Habits of mind
- Tendency to try actively to analyze problems, ask questions, and get information

The third component of the new definition of intelligence concerns habits of mind and a positive, mindful disposition toward learning: the *tendency* to ask questions, get information, and analyze and synthesize ideas. These dispositions characterize a learning orientation to achievement and, as we have seen, when people are motivated by learning-oriented achievement goals, they are disposed to put forth serious, sustained, and targeted effort to become smarter.

#### **Intelligence is learnable by living and working every day in environments that:**

- ❖ Coach you in using problem-solving skills
- ❖ Praise you for using them
- ❖ Hold you accountable for using them well
- ❖ Create the beliefs and dispositions that constitute intelligence

Defined this way, intelligence is learnable. People can become more intelligent by living and working every day in a particular kind of environment: one that coaches them in using problem-solving skills and praises them for using the skills; one that holds them accountable for using them well because it assumes they are smart and capable. This kind of learning environment can create the beliefs and dispositions that constitute intelligence.

We now turn to the question of how we would teach if Socializing Intelligence were our guiding principle.

### **Academic Rigor in a Thinking Curriculum**

If one were to visit a school where the culture was built around the principle of Socializing Intelligence, one would find certain artifacts, activities, and behaviors in place. The environment would abound with evidence of a highly rigorous curriculum, clearly focused and articulated, being implemented in a way that demanded lots of active mental work and questioning from not just some, but all of the students. Classroom discourse would feature a particular kind of talk: respectful, constructive, and inclusive discussion with plenty of push-back and challenge, as well as the expectation that arguments should be backed up by appropriate evidence and sound reasoning. Print-rich hallways and classrooms full of charts, rubrics, and recent student work would attest to clear and public expectations about the standards students were expected to meet. Students would refer to these resources in the course of their work and could explain what they meant, how they were used, and why they were important. One would see students taking responsibility for their own

learning, not only by using established criteria to guide their efforts but also by actively monitoring and regulating their own cognitive processes. One would see students noticing when they didn't understand and asking for clarification. They would be explaining things to themselves and others. Over time, it would be apparent that students were accurately judging and tracking their progress toward a goal, and making appropriate use of the resources in their environment--including teachers and partners, when necessary--to support their independent efforts. One might also see evidence of apprenticeship learning: students actively involved in doing projects and presentations under the expert guidance of teachers, coaches, and more advanced peers, then offering their work for critique by interested audiences beyond the classroom.

People only acquire robust, lasting knowledge if they themselves do the mental work of making sense of it. Good teaching is a matter of arranging for students to do their own knowledge construction, while assuring that the ideas students develop will be in good accord with known facts and established concepts.

However, it is a common misconception that constructivist forms of education obviate the need to teach kids facts. The claim is that if we teach children how to think, they will use those thinking skills to pick up facts when they encounter them through television, the Internet, or whatever information sources amuse them. But this is not what the research says. The cognitive research in learning is absolutely clear that knowledge matters. It is the basis for reasoning. Well-organized knowledge allows people to learn and use large amounts of information in productive ways.

The real challenge for educators is to integrate rigor of content with high-level thinking and active use of knowledge, not only because that is the way real learning takes place but also because of the economics of time. Time is always limited, however creatively we stretch it in effort-oriented schools. One way to get more learning into the limited time that we have is by continually combining rigorous content with high thinking demand and active sense-making.

### ***Commitment to a Knowledge Core***

- An articulated curriculum that avoids needless repetition and progressively deepens concepts
- Curriculum and instruction organized around major concepts
- Teaching and assessment focus on mastery of core concepts

There is no such thing as a thinking skill without good, solid stuff to think about. In fact, what you know is the biggest determinant of how well you will understand the next thing you read on a topic or how crisply you will be able to make and defend your arguments. Reading comprehension, reasoning skill, writing skill, problem solving--all of these thinking skills depend on what you know. The only way to develop thinking skills is around a knowledge core. Endorsing the constructivist argument that kids have to be active learners in order for learning to take hold does not free us of the obligation to offer a very solid, academically rigorous curriculum with important facts and ideas in it that kids have to know. On this basis, the principle of Academic Rigor calls for commitment to a knowledge core.

This means having an articulated curriculum that progressively deepens students' understanding of core concepts while avoiding needless repetition. It means choosing concepts that matter and going into those in depth. It means focusing everything--teaching, assessment, and everything else that supports learning--on students' deep mastery of those concepts.

### ***High Thinking Demand***

- Students expected to raise questions, solve problems, reason
- Challenging assignments in every subject
- Extended projects
- Explanation and justification expected
- Reflection on learning strategies

The principle of Academic Rigor in a Thinking Curriculum also calls for high thinking demand. This means infusing every learning opportunity with a press for deep understanding. It means students are

expected to raise questions, to solve problems, to think, and to reason. It means they are doing challenging, high-level assignments in every subject, including extended projects in which original work and revision to standards is expected. High thinking demand challenges students to construct explanations of their thinking and justification for their arguments, not just get the right answers. In a top-notch math lesson, even when the kids get the correct answer within the first few minutes, class discussion that focuses on *why* that answer is correct supports deep conceptual work by challenging students to explain their thinking and reflect on their learning processes and strategies. These high thinking demands, normal in programs for the gifted and talented, should be the daily fare of all students.

### ***Active Use of Knowledge***

- Synthesize several sources of information
- Test understanding by applying and discussing concepts
- Apply prior knowledge
- Interpret texts and construct solutions

Finally, Academic Rigor in a Thinking Curriculum calls for active use of knowledge. This means developing classroom discourse, instructional tasks, and assignments that require students to interpret texts and synthesize multiple sources of information, test their understanding of concepts by applying and discussing them, and use their prior and out-of-school knowledge.

## **Accountable Talk**

Talk is essential to learning

Talk must be accountable

to the learning community  
to knowledge  
rigorous thinking

Although educators hold divergent views about classroom behavior, most would probably concede that silence is not necessarily golden. Many would probably agree that talking is essential to learning, and when students actively engage with learning through talk, the classroom is bound to get noisy sometimes. Where academic rigor and a thinking curriculum are being practiced together, a substantial portion of instructional time will involve students in talk related to the core concepts that are being studied.

But it is not true that a noisy classroom is necessarily a good one, any more than a silent classroom is. What matters is what students are talking about and how. When students are merely chattering with each other or shooting the breeze about various social events--or if they are simply going through the motions of discussion without really working on the learning problem--the talk distracts from their learning rather than advancing it. To be valuable, talk has to be accountable.

Whatever its form--whole class discussion, small group work, peer or teacher conferences, interviews--talk should be accountable to the learning community, to knowledge and standards of evidence that are appropriate to the subject, and to generally accepted standards of reasoning.

Accountable Talk sharpens students' thinking by reinforcing their ability to use and create knowledge. Teachers create the norms and skills of Accountable Talk in their classrooms by modeling appropriate forms of discussion and by questioning, probing, and leading conversations. For example, teachers may press for clarification and explanation, require justifications of proposals and challenges, recognize and challenge misconceptions, demand evidence for claims and arguments, or interpret and "revoice" students' statements.

Over time, students can be expected to carry out each of these conversational "moves" themselves in peer discussions.

## ***Accountability to the Learning Community***

- Actively participate in classroom talk
- Listen attentively
- Elaborate and build on each other's ideas
- Work to clarify or expand a proposition

When classroom talk is accountable to the learning community, students do a lot of talking related to the subject being studied or the issue under discussion. Students listen to one another, not just obediently keeping quiet until it is their turn to take the floor, but attending carefully so that they can use and build on each other's ideas. They can paraphrase and expand upon one another's contributions. If they aren't sure they understood what someone else said, they make an effort to clarify. They disagree respectfully, challenging a claim, not the person who made it. They move the argument forward, sometimes with the teacher's help, sometimes on their own.

Obviously, this kind of talk calls for a certain amount of patience, restraint, and focused effort on the part of students and teachers alike. A youngster who experiences a blinding insight in the middle of a discussion may need to be reminded not to trample all over his classmates' talk in his eagerness to express his thoughts. An adolescent trying out a new idea in front of her peers may need encouragement to articulate her position. And educators with limited time to help their students reach the standards must resist the temptation to forego discussion if they think it will veer out of control, and take more time than the immediate learning outcomes appear to justify.

## ***Accountability to Knowledge***

- Specific and accurate knowledge
- Appropriate evidence for claims and arguments
- Commitment to getting it right

Accountability to Knowledge means that when speakers make an observation or claim, they try to be as specific and accurate as possible, not just saying any old thing that comes to mind. Speakers should be confident that what they are saying is true and, if challenged, should be prepared to back it up with evidence that meets the standards of the discipline. In classrooms where Accountability to Knowledge is the norm, students expect to ask and answer challenging questions, to work hard at "getting it right": Why do you think that? How did you arrive at that conclusion? What is your evidence? Their responses to such questions will cite a specific passage from text that they are working with or refer to knowledge built in the course of discussion. They might offer an explanation or example grounded in knowledge from outside the classroom that is accurate, relevant, and accessible to the whole group--that is, something that they can refer to together. They do not shut down discussion with emotive statements of personal opinion or preference that defy challenge.

This does not mean there is never a place for feelings in accountable classroom talk. The appropriateness of evidence is discipline-specific. When students are digging into a good poem, for instance, they might be trying to sense how the words and rhythms create tension or convey emotions. One would not expect a logical proof as evidence that a verse of iambic pentameter evoked a particular emotional response. But if a student explaining his thinking about a fractions problem were to say "I think the 4 stays the same because it just feels right that way," he is not being accountable to the standards of evidence that apply in the discipline of mathematics. There are different standards of evidence in different fields, and children need to be inducted into those different kinds of academic communities. As early as first grade, we can begin to socialize them into those different worlds.

## ***Accountability to Rigorous Thinking***

- Synthesize several sources of information
- Construct explanations and test understanding of concepts
- Formulate conjectures and hypotheses
- Employ generally accepted standards of reasoning
- Challenge the quality of evidence and reasoning

When classroom talk is held to rigorous thinking standards, students refer to a variety of texts as sources of information. They connect ideas within and between texts and use appropriate background knowledge to support their ideas and opinions. In constructing explanations, they recognize and acknowledge when more information is needed. They use sequential ideas to build logical and coherent arguments, using a variety of types of evidence. Students ask questions that test their own understanding of concepts, redefining or changing explanations as needed, and identifying their own biases. They draw comparisons and contrasts among ideas and indicate to what degree they accept ideas and arguments.

In classroom talk that is accountable to generally accepted standards of reasoning, students use rational strategies to present arguments and draw conclusions. They provide reasons for their claims and conclusions, and fashion sound premise-conclusion arguments. They use examples, analogies, and hypothetical "what-if" scenarios to make arguments and support claims. In order to stay on topic and further the discussion, students can "park" argument issues and claims for later discussion.

Finally, accountability to rigorous thinking means students and teachers assess and challenge the soundness of each other's evidence and quality of reasoning, often posing counter-examples and extreme case comparisons to illustrate a point. Hidden premises and assumptions of students' lines of argument are uncovered and examined.

## **Clear Expectations**

- Standards available and discussed
- Models of student Work
- Students judge their own and others' work
- Intermediate expectations specified
- Families and community informed

For teaching and learning environments to create intelligence, they must communicate clear expectations about what students will learn, how they will learn it, and what qualifies as good work. This means setting explicit content and performance standards that all students will work to achieve, and making those standards clear to everyone--students, teachers, principals, parents, and the community--by displaying and discussing them regularly. Only when students know what is expected and are able to assess their progress toward a set goal can they take responsibility for their own learning. Especially with young children, who do not think very far into the future, there should be intermediate expectations along the way to the standards. This allows learners to grasp and be motivated by a series of manageable challenges that build upon each other. It also enables frequent recognition and celebration of students' accomplishments.

Educators can help students internalize the expectations by having them develop rubrics and criteria charts that express the standards for quality work in the students' own words. By reflecting on exemplars and models of student work that meet or are on the way to meeting standards, students can learn to judge the quality of their own and others' work. Models should also demonstrate the process used by learners to reach an understanding or follow a path of reasoning. The social setting of the classroom can provide occasions for modeling effective thinking strategies that include not only the final model but the process itself. In other words, not only is the final product of the learning pictured for learners, but the learner's thinking aloud to get to the final model is made visible. Moreover, social interactions tied to reflections about learning can motivate students and establish the disposition to use deeper thinking skills. This disposition is reinforced when family and community are informed about the accomplishment standards that children are expected to

achieve. Students spend the majority of their time--and experience most of their socialization--outside the classroom. Therefore it behooves us as educators to extend our efforts at creating intelligence by moving the audience for the student's work beyond the classroom into the community and family.

### **Self-management of Learning**

- Metacognitive strategies explicitly modeled, identified, discussed, and practiced
- Students play active role in monitoring and managing the quality of their learning
- Teachers scaffold students performance during initial learning, gradually remove supports
- Students become agents of their own learning

Of all the findings of learning researchers over the past few decades, two stand out as especially significant to the work of educators. One concerns the centrality of knowledge to thinking. The other is about how important it is for people to monitor and regulate their own cognition.

Self-management of Learning is about students taking responsibility for their own learning by monitoring and regulating their own cognitive processes with increasing spontaneity and sophistication. People can pace themselves through any kind of learning--sports skills, cooking skills, academic knowledge--if they know what they are trying to do, if they have an idea of what constitutes mastery, and where they are in the process. Without this bigger picture, learners become dependent on someone else every step of the way to tell them what is good or not good and what to do next. Helpless dependency is the antithesis of Self-management of Learning.

But the notion of self-management goes beyond clarity about the expectations set by others. Taking responsibility for one's own learning calls for metacognitive skills and habits of mind that allow learners to monitor their own understanding of concepts and to reflect on what is being learned, checking new insights against prior understanding and connecting new information to existing stores of background knowledge. The more connected knowledge a person has in a particular area, the greater his or her expertise. In carpentry, for example, a novice may be able to name various tools and show you how they work, but an expert can also tell you what the purpose and function of each tool is, select the best tool for each task, and describe the consequences of using a tool incorrectly or the rewards of using it exceptionally well. The expert's knowledge is connected, through years of attention and experience, in ways that constitute deep understanding, or expertise. The more expertise people have, the better they are able to self-manage--to act as the "agents" of--their own learning.

Learners also exercise agency over their learning by holding themselves accountable to high standards of understanding. Using such strategies as paraphrasing and self-explanation, they reach for deep understanding of whatever they are studying. They do not move on to the next step of the learning process until they are confident that they have really mastered the concepts, because they know that each new idea builds on the last. Students manage their own learning process by seeking extra help or more information when they determine they need it. The ability to know when and what kind of help is needed is a sign of expertise. An Olympic figure skater, for example, knows when to ask her coach to critique her performance and suggest ways it might be improved. She does not hesitate to ask for expert guidance, nor does she request it simply for the sake of garnering praise. Because she is carefully monitoring herself, the skater knows how to figure out what she is having trouble with, even if her coach can't see it. So she might figure out, or ask her coach to figure out with her, if the problem needs to be addressed by the coach or a trainer, or perhaps by a change in the choreography or music.

When students are explicitly taught to assume this kind of agency through *scaffolded* learning experiences, they can begin to take responsibility for their own level of engagement with learning--concentrating and paying attention to the material--not just to stay out of trouble but because they want the payoff that active engagement brings. Students who are taking responsibility for their own engagement with learning can work productively and without distraction in a variety of settings--independently, with a partner, or in small groups--without the need for constant adult supervision. In group work, they participate actively:



insisting on their own understanding, helping others understand, giving thoughtful and responsible feedback, and carefully considering feedback from others.

## Learning as Apprenticeship

- Students create authentic products and performances for interested, critical audiences
- Experts critique and guide student work
- Finished work meets public standards of quality
- Learning strategies are modeled

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 for real audiences. This kind of apprenticeship learning allowed students to learn the knowledge, practical abilities, and appropriate forms of social behavior that went with high levels of skilled performance in a particular field. And it allowed them to learn complex skills that drew on many branches of knowledge. 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 of finished work to interested and critical audiences, and by organizing learning environments so that complex thinking and production is modeled and analyzed. Although apprenticeship forms of learning are particularly suitable for applied learning or for school-to-work programs, the basic strategies of apprenticeship can be used to redesign much of in-school classroom practice as well.

Apprenticeship learning has traditionally been associated with arts and crafts. Since the mid-1980s, however, learning researchers have been exploring the concept of *cognitive apprenticeship* and experimenting with school learning environments that include its key features: modeling and observation, active practice, scaffolding, coaching, and guided reflection.

- ❖ *Modeling and observation.* Apprentices spend a significant amount of time observing masters or more advanced apprentices at work. From this observation, mediated by conversations in which critical features of the work or product are pointed out and processes are analyzed, they learn to discriminate good from poor practice, and acceptable from unacceptable outcomes.
- ❖ *Active practice.* This is the heart of apprenticeship, where most learning comes from actually working at a task or project, rather than learning from a removed position about how it is done. As apprentices to teachers, visiting experts, and sometimes their more advanced peers, students practice learning by developing products and performances under controlled conditions in and beyond the classroom.
- ❖ *Scaffolding.* Apprenticeship learning models do not require that beginners do the entire job that they are learning by themselves. Instead, products are created jointly, apprentices doing the part they can, masters or more advanced apprentices doing the more demanding parts. The more experienced person, in other words, provides a form of scaffolding for the work of the beginner. As student apprentices begin to develop competence in a content area--and the self-management skills that develop alongside expertise--teachers gradually reduce the amount of supportive scaffolding they provide and students must make more and more decisions for themselves.
- ❖ *Coaching.* Successful apprenticeship also depends on the availability of a coach--a supportive expert who observes and comments on the apprentice's efforts, who challenges and suggests modified ways of working. Student apprentices are coached by their teachers, visiting experts, and their more advanced peers.
- ❖ *Guided reflection.* Successful learning, like successful teaching and other professional practice, must be a reflective process, one in which individuals are continually considering, evaluating, and improving on their own work. This reflective capacity and disposition needs to be cultivated during the apprenticeship period. It is not just a matter of time for reflection--although that is crucial--but also the opportunity to engage in a reflective process with a community of others.

## Organizing for Effort

- Clear and high expectations
- Curriculum geared towards standards
- Fair and credible evaluations
- Recognition of accomplishment

To apply the Principles of Learning in a way that really produces high levels of learning in diverse populations, we will have to *organize* our system differently from the way it has been organized throughout the past century. We will have to organize our classrooms, schools, and districts for the kind of *effort-based learning* that creates intelligence. What would such a system look like? How might it work?

If one were to analyze policies and practices at various levels in districts adhering to the Principles of Learning, one would find everything organized to promote effort-based learning on the part of students and educators alike. There would be no question about the expectations that were in place, because the language of the district's officially endorsed standards would be seen and heard everywhere. Students, teachers, principals, professional developers, staff, and administrators would all be able to describe in their own words what they were working toward in each subject area and at each grade level. All curricula and assessments would be geared to the standards. Students and teachers would know the criteria on which their performances were going to be assessed and be able to prepare for evaluation. Assessment practices would be both rigorous and rich in ways that would give them credibility in the eyes of employers and institutions of higher learning.

One would see and hear evidence that students were being recognized frequently for real accomplishments in ways that motivated them to take responsibility for their own learning by putting forth sustained and targeted effort in pursuit of high standards. Scheduling, policies, and resource allocations would reflect a district-wide commitment to professional development and two-way accountability in the form of nested learning communities.

The essential features of such a system are embodied in the Principles of Learning.

For example:

**Clear Expectations.** If students are to work hard, they need to know what they are trying to learn, what the criteria of "good enough" performance are. An equitable system must also set clear, public standards that establish very high minimum expectations for all students, yet also recognize outstanding performance.

**Academic Rigor in a Thinking Curriculum.** This principle calls, in part, for a curriculum that is geared to the standards, that marries knowledge and thinking about major concepts that everyone is expected to master.

**Fair and Credible Evaluations.** If students are going to put out serious effort, they need to know that they will be evaluated fairly--that is, on content and skills that they have had a chance to learn--and that those evaluations will be honored and respected.

**Recognition of Accomplishment.** Hard work and real achievement deserve celebration. And celebration invokes future effort. An education system that actively tries to promote effort will make sure that its schools organize visible, important events highlighting the work students are doing and pointing clearly to achievements that meet the publicly established quality standards.

## Fair and Credible Evaluations

- Exams referenced to standards
- Curriculum and assessments aligned
- Grading against absolute standards, not curve
- Reporting system makes clear how students are progressing toward expected standards
- Public accountability systems and instructional assessments aligned

If students are to put out serious effort, they need to know that they will be evaluated fairly, and that those evaluations will be honored and respected. There is more to fairness than the simple absence of bias in tests and examinations.

Fair evaluations are also transparent. Their content is known in advance; they can be systematically and effectively studied for. It is important for students to have the experience of studying hard to pass an examination that they know counts in the world, and for which they have been systematically prepared by teachers who themselves understand what is to be examined.

Local tests and exams made up by teachers and administered at the end of teaching units or marking periods generally meet the "transparency" criteria. That is, students can study for them, and they are clearly related to the taught curriculum. But, especially for students from poor schools, those tests do not really "count." They are not credible to the world at large. It is understood that an A or B grade in an inner city school does not necessarily mean that the student earning it could earn the same grade in an upscale, suburban school or a private school.

A credible evaluation system, one that will evoke sustained effort by students and teachers throughout the system, must evaluate students from all kinds of schools against the same criteria. That means it must include some externally set exams graded by people other than the students' own teachers, along with external quality control of grades based on classwork (as in an audited portfolio grading system, for example). Neither of these is a new idea. Some version of external exams and audited classwork is used in virtually every country except ours as the basis for diplomas, university entrance, and employment. Joined with the other elements of an effort-oriented system, this kind of evaluation system constitutes a strategy for optimizing both equity and excellence in our schools.

### **Recognition of Accomplishment**

- Frequent recognition of student work
- Recognition for *real* accomplishment
- Clearly demarcated progress points
- Celebration with family and community
- Employers and colleges recognize accomplishments

Socializing the beliefs, skills, and dispositions that comprise intelligence requires daily participation in environments that are organized to encourage sustained and targeted effort. One way to motivate learners to participate and do the hard work is to frequently recognize and celebrate their accomplishments. Any good football coach can tell you that if fans stopped coming to the games and rallies, the players would soon lose interest in putting themselves through the rigorous training that produces a top-notch team. Similarly, students need to know that people they care about notice and value their progress.

For young children, this recognition can take the form of special events and occasions that regularly allow family members, friends, and others who are important in their lives to witness and applaud the children's accomplishments. And recognition should be for *real* accomplishments: progress toward the achievement of a rigorous performance standard. If students are recognized for simply trying hard or being good citizens, the whole process will lack credibility in the eyes of both the children and the community.

Older students may need more than celebrations to keep them working hard and believing in their ability to get smarter. In addition to encouragement from their family and friends, adolescents, whose main interest is in the process of becoming adults and being received into adult communities, usually want to see a connection between what they are doing in school and what their college and workplace opportunities are going to be after they finish. Providing the kinds of payoff that older students value as recognition can be a challenge. It is difficult to find forms of payoff that motivate without unduly constraining or narrowing what young people are working on--that balance extrinsic and intrinsic motivators so they become mutually supportive. But without some kind of celebration and payoff, who would keep working?

**If you work hard, we will provide the learning opportunities and support you need to meet standards that will prepare you for successful participation in further education, civic life, and satisfying work.**

This is a demanding educational world that we are talking about--one with rights and responsibilities on every side. Students have the responsibility to put forth the effort required to complete complex, rigorous assignments that help them reach high standards of achievement. At the same time, they have a right to demand as much time and expert instruction as they need to support their efforts.

Educators have the responsibility to support students through this difficult work by providing the resources they need. Instead of holding time fixed and allowing results to vary, we need to set an absolute standard for what we expect in the way of results, and allow time and the other resources that go with it to vary. Such an arrangement recognizes that some students need more time and support than others but does not change expectations according to initial starting point.

At the same time, if educators are going to meet students' demand for expert instruction, they also have the right to expect support, in the form of coaching and professional development that allows them to continually learn more about both content and instructional practice. This means that new forms of professional development--for teachers now in the force as well as for new people preparing to enter the field--are an essential ingredient of effort-based education.