

# Celebrating Diverse Minds

*Many faltering students have specialized minds—brains exquisitely wired to perform certain kinds of tasks masterfully.*

**Mel Levine**

**A** distraught mother recently sent me this e-mail: *Every morning when I send Michael off to school, I feel as if I'm sending him to jail. He can't spell, he forgets his math facts even after we study them together, his handwriting is hard to decipher, and he is hopelessly absent-minded. The other kids see his papers and say that he "writes like a mental case." All day, he faces nonstop criticism from his teacher. She scolds him in front of his classmates for not trying. And you know, his teacher's right. He's not trying—he's scared to try. He's decided that if you're going to fail, it's better to fail without trying.*

*He can fix absolutely anything that's broken and he is brilliant when he plays with his Legos. I can't believe the complicated things he makes. He is convinced that he is hopelessly dumb, and he worries about school all the time. A lot of nights, Michael cries himself to sleep. We are losing this darling boy and he is such a beautiful child, such a decent kid. Please help us.*

We have all heard the success stories of Albert Einstein, Thomas Edison, Steve Jobs, and Charles Schwab—accomplished adults whose minds failed to fit in school. But what becomes of those whom we never hear about—students like Michael, who give up on themselves because they lack the kinds of minds needed to satisfy existing criteria for school success?

For more than 30 years, my work as a pediatrician has been dedicated to such out-of-step children and adolescents. Although some of them have officially acknowledged collisions with word decoding or attention, many contend with more elusive differences in learning. These students may have trouble organizing time and prioritizing activities, communicating effectively,

grasping verbal or nonverbal concepts, retrieving data precisely and quickly from long-term memory, recognizing and responding to recurring patterns, or assimilating fine detail.

Such insidious dysfunctions can constitute daunting barriers, especially when they are not recognized and managed. Most important, these breakdowns can mislead us into under-

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valuing, unfairly accusing, and even undereducating students, thereby stifling their chances for success in school and life.

### **The Challenge of Disappointing School Performance**

Many faltering students have specialized minds—brains exquisitely wired to perform certain kinds of tasks master-

fully, but decidedly miswired when it comes to meeting other expectations. A student may be brilliant at visualizing, but embarrassingly inept at verbalizing. Her classmate may reveal a remarkable understanding of people, but exhibit no insight about sentence structure.

Within every student contending with learning differences, an area invariably exists in which her or his mind has

been amply equipped to thrive. In the e-mail from Michael's mother, the clue to his mind's early specialization practically jumps out at you: "He can fix absolutely anything that's broken." Michael's mechanical brilliance gets eclipsed by our focus on what he can't do.

I love to spend time explaining his strengths and their possibilities to a student like Michael who feels depleted

and diminished (and perhaps even demolished) by the experience of school. I talk to him about the different careers in which he could readily succeed given the abilities he already possesses. I feel as if I have stepped inside a shadowy passageway suddenly illuminated, as revealed by a newly radiant facial expression. I can't help but conclude that the real challenge for schools rests more with identifying and fortifying individuals' strengths than with caulking academic crevices.

My long-term experience working at the interface between pediatrics and education has allowed me to synthesize the body of research on neurodevelopmental function and variation (Levine & Reed, 1999) and to construct a framework for understanding the enigma of disappointing school performance. Three factors play major roles:

- The traditional paradigms for understanding learning differences focus on exposing and fixing deficits, often neglecting the latent or blatant talents within struggling learners.

- Instructional practices and curricular choices fail to provide educational opportunities for diverse learners and to prepare them for a successful life.

- Because knowledge about learning emanating from the explosion of insights from brain research is not yet part of teacher preparation and professional development, most educators lack the expertise to understand and support their students' diverse minds.

To stem the tide of needless and wasteful failure facing thousands of kids, we need to take robust action on three fronts: broadened student assessment, curriculum reexamination, and professional development for educators.

### **Broadened Student Assessment**

The methods that schools typically deploy to assess students with learning problems are not up to the task. The discrepancy formulas used to determine eligibility for specialized assistance have been shown repeatedly to have serious flaws (Kavale & Forness, 2000).

Moreover, testing that merely generates a label, such as LD or ADD, accom-



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plishes little. These vague labels do not suggest specific approaches to remediation; instead, they pessimistically imply a relatively permanent pathological condition. What a colossal self-fulfilling prophecy! Most important, diagnosis spawned from a deficit model fails to take into account the most important feature of a student—his strengths.

### **Smokescreen Labels**

Phillip's parents reported that he seemed to generate about two highly original and unorthodox ideas per minute. His teacher described this irrepressible 4th grader as a brilliant conceptualizer, always coming up with creative analogies. When the class studied terrorism, Phillip compared suicide bombers to strep germs that make you sick and then die in your throat.

But Phillip's day-to-day performance in school was disappointing. When he

listened or read, Phillip missed or forgot much of the information he was expected to absorb. He would tune out and become fidgety during extended explanations or directions. His parents sought help from their son's pediatrician, who diagnosed ADD and prescribed a stimulant medication. This treatment helped, but not much.

It turns out that Phillip owned the kind of mind that becomes enthralled with the big picture and rejects fine detail. Consequently, in math he mastered the concepts readily but couldn't be bothered to notice the difference between a plus sign and a minus sign (a mere detail). His writing was creative and amusing but sparse on specific information. In subject after subject, Phillip's overall understanding far exceeded his handling of the details.

Like Phillip, many kids with problems don't ooze easily into categories. Students with his kind of detail intolerance often



get diagnosed with ADD or accused of not really trying. In Phillip's case, the label ADD was a smokescreen that obscured people's view of his remarkable strengths and stopped them short of managing his specific weakness in detail assimilation. Phillip improved markedly after his teacher began encouraging him to make detail thinking a separate step in any activity he undertook—scan first, get the big picture, have some great ideas, and then revisit the material to vacuum up the important details.

Incidentally, society desperately needs big-picture people who can collaborate meaningfully with administrators who thrive on detail. So let's take care not to disparage or discourage the flourishing of Phillip's kind of mind.

### ***Assessment for Diverse Minds***

In addition to rethinking the assessments used to diagnose learning problems, schools need to design regular tests and quizzes so that different kinds of minds can show what they know in different ways. Teachers should be careful not to tap exclusively rote memory or straight regurgitation of skills and knowledge. They should often allow students to use notes and encourage them to take as much time as they need to respond to questions. It makes more sense to limit space than time—for instance, telling students, "You can't write more than two pages, but you can take as long as you want to do so."

High-stakes testing can pulverize many mismatched students. How commonly does end-of-grade testing discriminate against certain kinds of minds? Frequently. As a clinician, I encounter many students who have

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difficulty performing on multiple-choice tests or operating under timed conditions. These students' dysfunctions in certain skill areas are more than outweighed by their assets in other domains, but standardized testing never gives them the opportunity to exhibit their strengths.

On entering the medical profession, we take an oath that in our practice we will first of all "do no harm." I offer five suggestions (see "Do No Harm" Testing Practices, p. 17) to my professional colleagues in education so that they may strive for testing practices that do no harm to students with different kinds of minds. We need to advocate for the elimination of testing practices that inflict needless damage and unfair humiliation on so many students.

### **Curriculum Reexamination**

It's ironic that at the same time that neuroscience is telling us so much about differences in learning, we are imposing curriculum standards that offer our students fewer learning alternatives than ever before. If we aspire to meet the challenge of leaving no child behind, we must provide diverse learners with diverging pathways that lead to their success. Such roads should maintain rigorous performance standards, while permitting innovation and creativity in curricular choices and allowing early, highly specialized minds to envision and prepare for productive adulthood.

For example, children like Michael, with his impressive mechanical aptitude, should not be sentenced to wait until adulthood to experience success.



We should encourage, not constrain, the development of magnet schools and vocational education opportunities. I look forward to the day when thousands of students pursue a vocationally oriented curriculum that does not put a ceiling on their aspirations.

While studying auto mechanics (and the physics that is a part of it), a teenager should learn the ins and outs of various related careers. She or he should see the possibility of someday climbing the corporate ladder at Ford Motor Company, owning a repair business franchise, designing solar-powered engines, or managing the service department of a dealership. In this way, no one gets written off or limited because of the nature of his passions or the specialized apparatus of her mind.

Many schools have worked against odds to provide educational experiences that involve all students in conducting independent study projects in their area of personal affinity and ability. One school, for example, asked all 3rd grade students to pick a country and become the school's leading expert on that nation. The projects carried over from 3rd through 5th grade, and the students traversed content areas as they studied their country's culture, history, language, animal life, government, and music. They did art projects and wrote reports on their country.

Students learned how it feels to know more about something than anyone around, including their teachers and parents. They became valued consultants on particular countries; when the newspaper reported a current event in their country, they were asked to provide some commentary in class—a great vitamin for intellectual self-esteem!

Another school pursued a similar strategy during students' three years in middle school. Students selected any topic from a list for long-term pursuit across disciplines. They found experts in the community to assist them with their topics. Any student who did not want to claim one of the listed topics could submit one of his



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or her own choosing.

I look forward to the day when our schools offer every student the opportunity to become a leading expert on a chosen topic—one that harmonizes with his or her kind of mind—and to share that expertise with the community through Web sites, community-based projects, and other venues. Such a practice would give students a powerful experience of success, as well as cultivate their appetite for systematic research and focused, in-depth knowledge.

While advocating ardently for flexibility in achieving the educational aims of schooling, we can still preserve student accountability. No student should be permitted to work, study, or produce less than his or her peers. But we should never insist that everyone put forth identical output.

### **Professional Development for Educators**

In medical practice, highly specific knowledge of the individual needs of a patient is indispensable when selecting the best treatment. This holds true in all "helping" professions—especially in education.

Teachers are in an excellent position to observe, interpret, and celebrate all kinds of minds on a daily basis. Newly acquired knowledge emanating from neuroscientific and education research can empower educators to observe and understand students' minds. Most of the phenomena that determine a student's individual strengths, shortcomings, and preferred ways of learning and producing cannot be found on any test that a clinician gives. Classroom teachers enjoy exclusive screenings—if they pay attention and know what to look for.

### **Becky**

Eight-year-old Becky is an accomplished origami creator, a deft modern dancer, and a gifted mathematician. She thrives on science and computers. Yet in school, this girl appears shy, passive, and eternally anguished. Becky has accurate spelling, but she dislikes writing and avoids it. Becky's teacher, Mrs. Sorenson, having been educated to observe neurodevelopmental phenomena, has noticed that Becky seems to struggle and falter when called on in class. Recently, the teacher led a discussion on whether animals have feelings as people do. She called on Becky and the following dialogue ensued:

Becky: My puppy feels, uh, things like happy and, um, sad.

Mrs. Sorenson: Becky, what makes her happy or sad?

Becky (after a long pause): Different things.

Mrs. Sorenson: Such as?

Becky: Like a dog, uh, basket.

Mrs. Sorenson: Do you mean a dog biscuit?

Becky: Yeah, like that.

Becky's reading comprehension is more than a year above grade level. Yet she has trouble with word finding, shows pronounced verbal hesitancy, puts forth only simple or incomplete sentences, and fails to use verbal elaboration. The same phenomena are conspicuous in her writing. Becky has strong receptive language but markedly weak expressive language—she understands better than she talks. No wonder she's so shy, self-conscious, and passive! Language output plays a vital role in school success. Verbal communication affects writing, class participation, social success, and the control of emotions and behavior.

Becky could fall through the cracks because we do not have valid tests of language production. For example, the WISC (the commonly used IQ test in her age group) does little to capture expressive language fluency. In fact, by far the best test of expressive language is a classroom teacher who knows what to listen for in gauging the adequacy of

a student's verbal output, and who understands the everyday classroom phenomena associated with breakdowns in language production.

### **Bruce**

Here's another example of the role that teachers can play in detecting learning differences. Bruce was disruptive in most of his 7th grade classes. He fashioned himself as an entertainer and often disengaged from classroom activities. Mr. Jackson, a social studies teacher knowledgeable about early adolescent development and learning, made the astute observation that Bruce often appeared confused about dates and about the sequences of events in the various historical periods that they studied. Mr. Jackson also noted that Bruce often looked distressed when given directions.

On one occasion, Mr. Jackson told the class:

This morning I want you all to open your books to page 47, read the first three paragraphs, and study the diagram at the top of the page. And

when you're finished doing that, read and think about the first two questions at the end of the chapter. I'm going to give you 10 minutes, and then I'll be calling on you to discuss the questions.

Bruce seemed to hear only something about page 47 (or was it 57?). His teacher suspected rightly that this boy was having problems processing sequences—sequential directions, chains of events in history, and multi-step explanations. His weak temporal-sequential ordering accounted for his problems in social studies and in math. This insight enabled teachers to give Bruce strategies to manage his sequencing problems: taking notes, whispering sequences under his breath, and picturing sequences in his mind. His behavior and demeanor in class improved dramatically.

Although continuing education programs abound to help teachers stay abreast of their content, we have found few comprehensive programs devoted to helping educators deepen their expertise in the science of learning. Our

## **“Do No Harm” Testing Practices**

1. Testing can help elevate education standards, but not if it creates larger numbers of students who are written off as unsuccessful. When a student does poorly, determine which link in the learning chain is uncoupled. Always have constructive, nonpunitive contingency plans for students who perform poorly on a test. Testing should not be an end in itself, but rather a call to action.
2. Not all students can demonstrate their strengths in the same manner. Allow different students to demonstrate their learning differently, using the means of their choice (portfolios, expert papers, oral presentations, and projects, as well as multiple-choice tests).
3. Never use testing as justification for retaining a student in a grade. Retention is ineffective and seriously damaging to students. How can you retain a child while claiming you are not leaving anyone behind?
4. Some students who excel on tests might develop a false sense of security and confidence, failing to realize that adult careers tap many abilities that no test can elicit. Take care to nurture vital capacities that are not testable.
5. Avoid the hazard of teachers' teaching to the tests because your work or school is being judged solely on the basis of examination scores. Teachers should never have their students rehearse or explicitly prepare for tests. Testing should be unannounced. Good results on such tests should be the product of the regular, undisturbed curriculum.

—Mel Levine

not-for-profit institute, All Kinds of Minds, has developed a professional development and school service model called Schools Attuned to help experienced classroom educators become knowledgeable about neurodevelopmental function and variation.<sup>1</sup> Participating teachers learn to analyze how their own instructional delivery and content taps specific aspects of memory, attention, motor function, language, and other areas of brain function. They are guided to observe everyday classroom phenomena that open windows on relevant learning processes (Levine, 1994).

Equipped with their Schools Attuned training, teachers lead a coalition involving the student, parents, and other adults in the school to unmask the specific learning profile of a struggling student. With help from professionals trained as neurodevelopmental consultants, whom we call profile advisors (usually school psychologists or special

educators), teachers become the primary detectors of student strengths, weaknesses, and content affinities. The teachers then infuse their insights into their daily group instructional strategies and lesson designs. Frequently, a strategy that they develop to help a particular struggling student benefits the entire class. It's called excellent pedagogy.

Schools Attuned teachers are also committed to making sure that all of their students learn about learning while they are learning. Through a process called demystification, they help students whose neurodevelopmental profiles do not currently mesh with expectations to learn about their own strengths and weaknesses and acquire the terms for the specific

processes that they need to work on. With profile advisors as their consultants, regular classroom teachers take the lead in formulating management plans for these students.

### Where We Need to Go

The core theme of K-12 education in this century should be straightforward: high standards with an unwavering commitment to individuality. In proposing that educators reexamine assessment, curriculum, and the role of teachers, I am advocating neurodevelopmental pluralism in our schools—the celebration of all kinds of minds. Such an ethos will be the most effective and humane way of realizing our commitment to leave no child behind. ■

<sup>1</sup>More information about the Schools Attuned program and All Kinds of Minds is available online at [www.allkindsofminds.org](http://www.allkindsofminds.org).

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Testing that merely generates a label, such as LD or ADD, accomplishes little.

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Statuette of a Seated Harp Player: ca. 2800-2700 B.C.; late early Cycladic I-Early Cycladic II; marble. H. 11 1/2 in.; Rogers Fund, 1947 (67.100.1)

