# Marshall Memo 104

A Weekly Round-up of Important Ideas and Research in K-12 Education
September 26, 2005

## In This Issue:



## Quotes of the Week

"The president's recent schedule of nonstop disaster-scene photo-ops is reminiscent of a principal of a failing school who believes he's doing a great job because he makes it a point to drop in on every class play and teacher retirement party."

*New York Times* lead editorial, Sept. 25, 2005

"If I write, 'I ain't got it; that's why I don't got it,' is that worth points?"

A Los Angeles high-school student, asked to write an essay on why it's important to remember to bring one's book to school ("Essays in Search of Happy Endings" by Michael Winerip, *New York Times*, Aug. 10, 2005)

"The teacher has to think from the learner's perspective, and to consider what it takes to understand a mathematical idea for someone seeing it for the first time."

Deborah Loewenberg Ball, Heather Hill, and Hyman Bass (see item #1)

"The real work of principals becomes that of supervising learning versus supervising teaching. The viability of future generations of teachers and students to thrive is largely dependent on principals making this shift."

Deborah Childs-Bowen (see item #8)

"Papa, we're doing nonfiction writing, and I'm doing dogs, and Sharon lets me. I have to go and get some books and find out about them. I love dogs. Can you believe it? Dogs. My favorite!"

Fraser, a first-grader, when his father picked him up from school (see item #3)

"Any of us can make an error, but when people operate in good faith… they admit to their error and correct it."

William Damon, Stanford professor, in a letter to *Education Gadfly*, Sept. 22, 2005

## 1. What Kind of Math Knowledge Produces Higher Student Achievement?

In this thoughtful *American Educator* article, a team of University of Michigan professors asked two questions: (a) Is there a body of mathematical knowledge for teaching that is specialized for the work that teachers do? and (b) If there is, do teachers who have a deeper grasp of that kind of knowledge get higher student achievement?

Yes to the first question. The Michigan researchers found that "effective teaching entails a knowledge of mathematics above and beyond what a mathematically literate adult learns in grade school, a liberal arts program, or even a career in another mathematically intensive profession such as accounting or engineering.

And yes to the second question. Three hundred teachers were tested and scores on measures of math knowledge significantly predicted the size of student gain scores (having controlled for student SES, absence rate, teacher credentials, teacher experience, and how long math lessons lasted). In the researchers' words: "Comparing a teacher who achieved an average score on our measure of teacher knowledge to a teacher who was in the top quartile, the students of the above-average teacher showed gains in their scores that were equivalent to that of an extra two to three weeks of instruction. Moreover, the size of the effect of teachers' mathematical knowledge for teaching was comparable to the size of the effect of socioeconomic status on student gain scores."

The type of math understanding that made a difference was knowing the grade-level content well enough to see why students were getting answers mystifyingly wrong; to know how to respond when students got the right answer using an unconventional approach; and to know how to respond to student questions like these:

- Why does it work to "add a zero" to multiply a number by ten?
- Why, then, do we "move the decimal point" when we multiply decimals by ten?
- Is this a different procedure or different aspects of the same procedure – changing the place value by one unit of ten?
- Is zero even or odd?
- What is the smallest fraction?

To illustrate the kind of math knowledge they are talking about, the researchers ask us to consider this whole-number multiplication problem:

$$\begin{array}{r} 35 \\ \times\ 25 \\ \hline \end{array}$$

Obviously teachers need to know how to solve this type of problem. But they must also be able to explain, listen, and examine students' work. For example, they should be able to see and size up a typical wrong answer:

$$\begin{array}{r} 35 \\ \times\ 25 \\ \hline 175 \\ 70 \\ \hline 245 \end{array}$$

It's wrong, but why? Because the student didn't "move over" the 70 in the second line. Helping a student overcome this common error involves explaining why the 70 should be slid over so that the 0 is under the 7 in 175 – which means explaining that the second step is actually 35 x 20, not 35 x 2 as it appears to be.

Not a slam dunk. Now how about this solution:

$$\begin{array}{r} {\scriptstyle 1\ \ \ } \\ {\scriptstyle 2\ \ \ } \\ 35 \\ \times\ 25 \\ \hline 255 \\ 80\_ \\ \hline 1055 \end{array}$$

What was the student *thinking*? How many teachers would see that the student added the carried 2 to the 3 in the top number and multiplied 5 x 5 instead of the correct procedure, (5 x 3) + 2, and then did the same thing when multiplying by 2? The teacher can always ask students to walk through what they did, but with a class of thirty, this can be difficult and it's good to have a working hypothesis about what might go wrong.

But being good at error analysis is not enough. Students not only make mistakes, but also ask questions, use models, and think up their own non-standard ways of solving problems. Teachers have to be able to come up with representations (for example, a 35 x 25 grid for the multiplication problem above) to help students visualize what's going on. They have to be able to explain the tricky role of zero as a place-holder, not a "real" number. And they have to be able to understand how things that adults take for granted are actually quite tricky, for example, the way everyday words have a different meaning in mathematics, for example mean, similar, even, rational, line, volume. "The teacher has to think from the learner's perspective," the Michigan team writes, "and to consider what it takes to understand a mathematical idea for someone seeing it for the first time."

Looking at national statistics, the researchers found that poor and minority students are less likely to taught by teachers with a sophisticated knowledge of mathematics. Therefore, they conclude, "one important contribution we can make toward social justice is to ensure that every student has a teacher who comes to the classroom equipped with the mathematical knowledge needed for teaching."

"Knowing Mathematics for Teaching" by Deborah Loewenberg Ball, Heather Hill, and Hyman Bass in *American Educator*, Fall 2005 (Vol. 29, #3, p. 14-22, 43-46)
http://www.aft.org/pubs-reports/american_educator/issues/fall2005/BallF05.pdf
If you want to see a really scary set of math problems that were on the California teacher certification exam in 1874, check out this link:
http://www.aft.org/pubs-reports/american_educator/issues/fall2005/Ball05SB1.pdf

## 2. Teaching Students to Read Between and Beyond the Lines

Lynne Williams, a Kentucky education researcher, recently visited a fifth-grade classroom that was in the middle of a unit on the American Revolution. She talked with students after a lesson and asked them what they knew about the Boston Tea Party, which they had just discussed. "Well, a bunch of Indians dumped tea in the water," said one student. "The Americans decided one day that they did not like tea and threw it in the water," said another.

Williams was dismayed at the lack of understanding and asked the teacher how she thought the class had gone. "Well, I thought the unit went well," she replied, noting that students had responded well to questions she had asked in class.

The gap between the teacher's perception and students' actual understanding led Williams and another researcher to conduct an action research project on the questioning techniques of eight 5th- and 6th-grade teachers. They tape-recorded scores of lessons, analyzed the types of questions teachers asked, and came to five conclusions:

• *Teacher questions were dominant*. The primary instructional strategy in these classrooms was teachers asking questions. But, the researchers noted dryly, "the mere presence and sheer number of teacher questions are not enough to ensure student learning."

• *Low-level recall questions ruled*. Basic recall questions made up 54% of what teachers asked. Many fewer questions tapped into deeper levels of understanding of what was being read. Only 13% of questions dealt with inference and 6% with predicting. Other types of questions were asked even less frequently (context clues, problem solving, comparisons, cause-and-effect, drawing conclusions, character development, sequencing, foreshadowing, and compare-and-contrast).

• *Fifth- and sixth-grade teachers asked similar types of questions*. In other words, there was no ratcheting up of the level of questions as students moved up a grade.

• *The questions students were asked didn't align with high-stakes tests*. Since most state tests have an increasing number of inferential-type questions and require evidence of real understanding based on open-response items, a steady diet of basic recall questions in the classroom leaves students unprepared and vulnerable when they take these tests.

• *Recall questions can be boring*. "[U]nderstanding is much more intellectually stimulating than recall because recall has a short shelf life," write the researchers. "It is hard for us to stay interested in things that we simply recall, but easy to stay enthralled with things that we understand and find interesting."

These insights suggest a number of strategies for teachers to use to make their classes more conceptually interesting and better prepare students for high-stakes tests:

- *Use higher-order thinking questions*. One strategy is to teach students to differentiate between "thick" questions (open-ended, big-idea) and "thin" questions (closed-ended, single-answer) and modeling the different types as they read: "Why" and "what if" for thick questions, "How far?" and "When" for thin questions.
- *Tap into other intelligences*. Give students a chance to show understanding of open-ended questions through art and music media.
- *Ask questions that can start and sustain discussions and take discussion in new directions*. This includes literature circles to help students share and discuss their insights, interpretations, and questions of a text, but also open-ended questions asked while a passage is being read aloud: "What are you thinking about at this point in the text?" "What kinds of connections are you all making to the text?" "Can anyone build on the comment that was just made?"
- *Get students asking their own questions*. When students ask questions before, during, and after reading, they understand more. "I wonder" (Harvey and Goudvis, 200) is a strategy that gets students writing "I wonder" statements in a journal as they read and then bringing their questions to a literature circle.

These and other approaches go beyond simple recall and get students reading between and beyond the lines, asking their own questions, and thinking metacognitively about how they are learning.

[Another approach to the same goal is planning curriculum units backwards using the Understanding by Design process: identifying state standards up front, formulating Big Ideas and Essential Questions for the unit, and deciding up front how student understanding will be assessed at the end.]

"Questioning Techniques of Fifth and Sixth Grade Reading Teachers" by William Bintz and Lynne Williams in *Middle School Journal*, Sept. 2005 (Vol. 37, #1, p. 45-52), no e-link available

## 3. Less Narrative, More Non-Fiction!

In this charming article, literacy consultant Tony Stead makes a strong pitch for elementary teachers to get their students reading and writing non-fiction in addition to the usual fare. Stead reflects on his own years of teaching: "I realized that for too long I had kept my students in a world of personal narrative and fantasy by providing demonstrations of these writing forms almost exclusively. When I looked through my classroom library, I found that 90 percent of the books were fiction stories. My read-alouds and shared readings were limited to the world of make-believe or personal narrative. No wonder my children wrote the same things every day and had become masters of these new forms."

Stead did an experiment. He jotted down all the types of reading, writing, listening, and speaking his first-grade son, Fraser, engaged in one Saturday. Almost 90 percent was nonfiction: his Game Boy, his clothes, his Pokémon sweater, and constant questions about How? When? Where? and Why? Why? Why?

But what really convinced Stead was when he picked up his son at school one day. "Papa," shouted Fraser, "We're doing nonfiction writing, and I'm doing dogs, and Sharon lets me. I have to go and get some books and find out about them. I love dogs. Can you believe it? Dogs. My favorite!"

So let's beef up non-fiction, urges Stead. And not just the topics that appeal to boys – a wide range of topics that gets girls equally enthusiastic.

"Opening the Door to a World of Possibilities" by Tony Stead in *American Educator*, Fall 2005 (Vol. 29, #3, p. 31-33)
http://www.aft.org/pubs-reports/american_educator/issues/fall2005/stead.htm

## 4. Overcoming Barriers to Differentiated Instruction

Carol Ann Tomlinson, a prolific expert on differentiated instruction, kicks off this series of articles in *Journal of Staff Development* with several pointed questions: "Is it likely that a student will learn fractions in a one-size fits-all classroom if that student has never mastered subtraction or division? Is it likely that a student will master a 7th-grade spelling list if her spelling skills hover around a 3rd-grade level? Is a student who reads like a high-school student likely to have a productive year in a reading program that assumes everyone should move lock-step through a 4th-grade reader?"

The answers are obvious, and yet most teachers don't differential effectively because one or more of these barriers get in the way:

- A lack of reflection on students as individuals;
- Lack of clarity about what students should know, understand, and be able to do as a result of a unit of learning;
- Inadequate repertoires of instructional approaches that invite student-centeredness and flexibility;
- Lack of skills to manage and facilitate flexible instruction.

Tomlinson says that teachers need staff development to overcome these barriers – staff development that helps them reflect on their students as individual learners, diagnose and chart kids' learning needs, is rooted in their everyday classroom practice, ensures that they work collaboratively with colleagues mutually solving learning problems, is sustained over time, and above all, is differentiated to their unique classroom needs.

In a sidebar in this article, Tomlinson spells out what she believes to be the characteristics of successful differentiation in the classroom:

- *Knowledge-centered* – Lessons are based on the teacher's clear understanding of what is essential in the instructional unit, and the teacher helps each student build his or her own maps of understanding and skill encompassing the essentials.
- *Proactive rather than reactive* – Teachers plan multiple routes for students to succeed rather than adapting one-size-fits-all lesson plans when it becomes evident that the lessons are not working.

- *Uses small, flexible learning groups for instruction* – Teachers plan to meet with various groupings of students based on a variety of needs throughout the learning cycle.
- *Uses a variety of materials* – This includes materials at a range of reading levels and materials that address various learning modalities.
- *Uses flexible pacing* – Teachers do not assume that a good day is one in which every student begins and ends a task at the same time.
- *Is learner-centered* – Teachers systematically study learner traits to understand what each student brings to the task, what each student needs to succeed with the task, and what the student needs to support his or her success.

"Traveling the Road to Differentiation in Staff Development" by Carol Ann Tomlinson in *Journal of Staff Development*, Fall 2005 (Vol. 24, #4, p. 8-12), no e-link available

## 5. How Do You Spell "Differentiate"?

In this article, two consultants share an acrostic that spells out the key components of differentiated instruction:

- **D**etermine the standards to be taught.
- **I**dentify student needs with strong assessments before, during, and after learning.
- **F**ormulate plans that link the targeted standards with individual needs.
- **F**ind effective strategies and activities to teach the information.
- **E**ngage students in activities that use their interests and the ways they learn.
- **R**elate learning to students' worlds.
- **E**ncourage risk-taking with wise choices.
- **N**urture the social and emotional aspects of students.
- **T**arget the learners' needs with flexible groupings.
- **I**gnite each student's desire to learn.
- **A**djust assignments to match kids' achievement, knowledge, and interests.
- **T**ailor lessons with student-focused activities.
- **E**ntice and ignite lifelong learners.

"11 Practical Ways to Guide Teachers Toward Differentiation" by Carolyn Chapman and Rita King in *Journal of Staff Development*, Fall 2005 (Vol. 24, #4, p. 20-25), no e-link available

## 6. Examples of Differentiation

This profile of two schools that have worked on differentiating instruction makes a liberating point for those who find the topic intimidating: Gayle Gregory, an author and staff developer, compares differentiation to a gourmet meal. "You wouldn't do it every day, but if you did it once a week, by the end of the school year, you'd have 40 differentiated lessons."

From Colchester High School in Vermont, the article gives an example of differentiation: In a unit on Greek mythology, students are assigned three different versions of Homer's *The Odyssey*: the standard, unabridged version; a somewhat abridged version that

includes a running menu of vocabulary words along the side of each page; or an easier-to-read story version. Everyone in the class is introduced to the book's major themes. Students then take on assignments based on their readiness and levels, learning styles, and interests. One group creates a Socratic seminar around the book's issues, another researches the structure of ancient Greek society; and another writes and performs their own version of *The Odyssey*.

"View from the Classroom" by Priscilla Pardini in *Journal of Staff Development*, Fall 2005 (Vol. 24, #4, p. 14-18), no e-link available

## 7. Differentiation Strategies from North Carolina

This article reports on the successful implementation of differentiated instruction in a North Carolina elementary school. Faced with test scores they were not satisfied with (79% proficiency on state tests), the school focused on differentiation, and five years later (2003-04), they were at 94.8% proficiency. The school used the following guiding principles:

• *Clear criteria* – Students know what is expected of them for every assignment. This may involve rubrics, oral guidelines, or a contract.

• *Ongoing assessment* – There are formal and informal checks on learning to monitor whether instruction is working for each child and tune lessons to students' readiness levels.

• *Multiple teaching strategies* – See the list below.

• *Varying group configurations* – These include whole group, small groups, pairs, and independent student work.

• *Emphasis on student strengths* – Students can play to their strong points when choices are available.

• *Recognition of learning modalities* – Giving opportunities for different learning styles to shine.

• *Consideration of student interests* – A key to student motivation.

The school used a variety of teaching strategies to reach all students:

- *Flexible groupings* – by readiness, interests, learning styles, etc.;
- *Learning centers* – for different subject areas or levels of complexity;
- *Independent contracts* – students can work solo or in pairs;
- *Adjusting questions* – according to students' readiness, interests, and profiles;
- *Thematic units* – to help students see links among disciplines;
- *Compacting* – if students already know material, teachers speed up;
- *Independent study* – students who have mastered material can pursue interests;
- *Tiered assignments* – the same content at different levels of difficulty.

"How to Implement Differentiated Instruction? Adjust, Adjust, Adjust" by Sylvia Lewis and Kelly Batts in *Journal of Staff Development*, Fall 2005 (Vol. 24, #4, p. 26-31), no e-link available

## 8. The Principal's New Role

Deborah Childs-Bowen, the president of the National Staff Development Council, has strong views on the evolving role of the principal. In a lead editorial in *Journal of Staff Development*, she wrote: "Now is the time to have a proper burial for the antiquated and dysfunctional role of principals. Let's put to rest the notion that school leadership is synonymous with charismatic, top-down, autocratic leadership. After we have paid our respects to the old way of school leadership, we must begin to embrace a vibrant new kind of leadership that is generated from inside out and bottom up. The real work of principals becomes that of supervising learning versus supervising teaching. The viability of future generations of teachers and students to thrive is largely dependent on principals making this shift.

"The new job description for the principal's role is that of a leader of leaders, chief instructional officer, and chief learning officer. This role requires a new set of assumptions, beliefs, attitudes, knowledge, and skills of leadership. The skills include analyzing and interpreting data, setting vision, and facilitating systems that support professional learning. Instructional leadership is accelerated when the leadership is distributed through an organizational culture and infrastructure that supports teaching and learning for both students and teachers. This requires a skillful balancing of autonomy, support, and accountability of staff for student learning."

"Rest in Peace, Charming All-Powerful Principal" by Deborah Childs-Bowen in *Journal of Staff Development*, Fall 2005 (Vol. 26, #4, p. 7), no e-link available

## 9. Fighting the Good Fight

In a passionate letter to *Education Gadfly* last week, Amy Wilkins, daughter of civil rights leader Roger Wilkins and a top administrator at The Education Trust, reacted to the recent writings of Lawrence Mishel and Richard Rothstein (in which they argued that schools cannot close the achievement gap until major progress is made on deep social and economic problems). Here are Wilkins's closing paragraphs:

"Faced with the damage that racism and poverty inflict, too many educators have simply given in and given up on these children, insisting that as much as they care about these kids, they are powerless to change their life chances until someone else acts to improve the conditions of their families and their communities. And they back up these claims and their inaction with quotes from people like Messrs Mishel and Rothstein. In a very real sense these educators… have surrendered to racism and poverty. And in doing so they have surrendered their students to dim futures at the cold and lonely margins of our economic and cultural mainstream.

"But some educators are not waiting and have not surrendered. These educators must not have yet read or heard Rothstein and Mishel and don't know that what they are doing is impossible. These are the educators who have chosen to fight, fight hard and smart against racism and poverty by teaching their students well – despite the challenges that racism and

poverty present. And fools that they are, these educators are helping poor, black and brown students gain the intellectual tools necessary not only to secure their own futures but also to do battle against racism and poverty on behalf of their communities. These educators are the true warriors against racism and poverty. Let's hope that they never learn that what they are doing can't be done!"

"No Surrender" by Amy Wilkins, principal partner at The Education Trust; a letter to *Education Gadfly*, Sept. 22, 2005

## 7. Short Items:

***a. Educational triage –*** Dallas News columnist Josh Benton describes one urban Texas elementary school's triage practices aimed at boosting its test scores. Teachers divided students into three groups:

- Safe cases (middle and high achievers)
- Suitable cases for treatment (the "bubble" kids)
- Hopeless cases

Teachers then committed time and resources (i.e., additional attention in class, enrichment sessions with the literacy teacher, and after-school, Saturday, and summer tutoring) only to students they considered most likely to improve the school's test scores. This left few resources for high-achieving, very low-achieving, and special education students.

"Education Triage and the Texas Accountability System" by Josh Benton in the *Dallas News*, spotted in *PEN Weekly NewsBlast*, Sept. 23, 2005; available after elaborate registration at: http://www.dallasnews.com/sharedcontent/registration/register.jsp?fw=http://www.dallasnews.com/sharedcontent/dws/dn/education/columnists/jbenton/stories/DN-edcolumn_19met.ART0.North.Edition2.945f45c.html,

***b. The power of place*** – The fall issue of *American Educator* has a series of vivid descriptions of American landmarks, including Independence Hall, The Old Courthouse in St. Louis, Missouri (where the Dred Scott case was argued). Try this link for details: http://www.aft.org/pubs-reports/american_educator/issues/fall2005/horton-into.htm

"The Power of Place" by James Oliver Horton in *American Educator*, Fall 2005 (Vol. 29, #3, p. 34-42)

***c. Wellness websites*** – This *American School Board Journal* supplement lists a number of websites that might provide useful resources for wellness programs:

• National Alliance for Nutrition and Activity has a report on model wellness policies: http://www.schoolwellnesspolicies.org

• Childhood obesity – The American Obesity Association features current research, causes, prevention, and treatment: http://www.obesity.org/subs/childhood

• Physical activity and nutrition – The National Association for Sport and Physical Education has the latest nutrition information and statistics and recommended guidelines for physical education: http://www.aahperd.org/naspe/template.cfm

"Wellness Resources" in *American School Board Journal's* "Getting to Wellness" supplement, September 2005



***Do you have feedback? Is anything missing?***

*If you have comments or suggestions, if you saw an article or web item in the last week that you think should have been summarized, or if you would like to suggest additional publications that should be covered by the Marshall Memo, please e-mail:* kim.marshall8@verizon.net

# About the Marshall Memo

### *Mission and focus:*

This weekly memo is designed to keep principals, teachers, superintendents, and others very well-informed on current research and best practices in K-12 education. Kim Marshall, drawing on 35 years' experience as a teacher, principal, central office administrator, and writer, lightens the load of busy educators by serving as their "designated reader."

To produce the Marshall Memo, Kim subscribes to 39 carefully-chosen publications (see list to the right), sifts through scores of articles each week, and selects 5-10 that have the greatest potential to improve teaching, leadership, and learning. He then writes a brief summary of each article, pulls out several striking quotes, provides e-links to full articles when available, and e-mails the memo to subscribers every Monday (with occasional breaks; there were 50 issues in 2003-04).

### *Subscriptions:*

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- A database of all articles to date, searchable by topic, title, author, source, level, etc.
- How to change access e-mail or password

### *Publications covered:*

(those read this week are underlined)

American Educational Research Journal
American Educator
American School Board Journal
ASCD SmartBrief
Atlantic Monthly
Bay State Banner
Boston Globe
CommonWealth Magazine
District Administration
Ed. Magazine (Harvard School of Education)
Education Digest
Education Gadfly
Education Next
Education Update (ASCD)
Education Week
Educational Leadership
Educational Researcher
Edutopia
Elementary School Journal
Harper's
Harvard Business Review
Harvard Education Letter
Harvard Educational Review
Journal of Staff Development
Middle School Journal
NABE News
NASSP Bulletin
New York Times
New Yorker
Newsweek
PEN Weekly NewsBlast
Phi Delta Kappan
Principal Magazine
Principal Leadership
Psychology Today
Reading Research Quarterly
Reading Today
Rethinking Schools
Review of Educational Research
Teacher Magazine
Teachers College Record
Theory Into Practice

E-links will be provided whenever possible.