Marshall Memo 344

A Weekly Round-up of Important Ideas and Research in K-12 Education
July 12, 2010

In This Issue:

Quotes of the Week

"Standards should not be the ends of education, but rather the beginning, the platform for creativity, innovation, and personalization."
Bryan Goodwin (see item #1)

"The extent to which teachers differentiate instruction in their classrooms is not a key variable in student success."
Bryan Goodwin (*ibid.*)

"While planning for the future is important, neither my students nor I live there. We live in the present. The future will be prepared for when the present has meaning."
Horace Lucido in "Coaching Physics" in *The Physics Teacher*, September 1988

"Most students hold conceptions that are at odds with those of their teachers or those of scientists. In general, students cling tenaciously to these ideas, even in the face of concerted efforts… Students do not quickly or easily change their naïve scientific conceptions, even when confronted with physical phenomena. However, given enough time and proper impetus, students can revise and rethink their ideas."
Marc Schwartz et al. (see item #6)

"It is well known that understanding develops as people try to resolve perplexities or dilemmas that cannot be immediately sorted out. Wrestling with perplexing situations often results in rethinking ideas and creating new and better explanations for how things work."
James Hiebert and Douglas Grouws (see item #2)

1. Five Things That Make the Biggest Difference in Schools

In this superb 71-page paper from McREL (Mid-Continent Research for Education and Learning) that is well worth reading in its entirety, Bryan Goodwin leads off with an Oliver Wendell Holmes quote – "I would not give a fig for the simplicity on this side of complexity, but I would give my life for the simplicity on the other side of complexity" – and goes on to give a pithy summary of what the research says are high-leverage, high-payoff strategies for schools:

• *Guarantee challenging, engaging, and intentional instruction*. Studies show that the difference in achievement for students who have the most effective and the least effective teachers is an entire year – that is, students who are fortunate enough to have the best teachers gain 1-1/2 years in an academic year while those who draw the short straw gain half a year. What do highly effective teachers do? (a) They challenge their students with high expectations and believe that students can get smart through effective effort. (b) They forge close relationships with students within positive classroom environments. And (c) they intentionally match instructional strategies to learning goals. "They not only know *what* to do to support student learning," says Goodwin, "but *how, when,* and *why* to do it." McREL's research has focused on nine of the most effective instructional strategies:

- Identifying similarities and differences;
- Summarizing and note-taking;
- Reinforcing effort and providing recognition;
- Homework and practice;
- Nonlinguistic representations;
- Cooperative learning;
- Setting objectives and providing feedback;
- Generating and testing hypotheses;
- Questions, cues, and advance organizers.

Interestingly, differentiation is not on Goodwin's list of exemplary classroom practices. He acknowledges that the case for differentiation (made most forcefully by Carol Ann Tomlinson), sounds logical, "but there's one problem," says Goodwin. "To date, no empirical evidence exists to confirm that the total package of differentiated instruction (e.g., conducting ongoing assessments of student abilities, identifying appropriate content based on those abilities, using flexible grouping arrangements for students, and varying how students can demonstrate proficiency in their learning) has a positive impact on student achievement… The extent to

which teachers differentiate instruction in their classrooms is not a key variable in student success." This could be because the research hasn't been done yet. Or it could be because "differentiated instruction is such a large undertaking that it's difficult to implement well and thus, difficult to study." Or it could be that the basic premises of differentiation are flawed (see page 13-14 of the study for details on this).

• *Ensure curricular pathways to success*. This means providing all students with standards that embody high expectations, and at the same time giving all students personalized learning opportunities. "Standards and personalization are not mutually exclusive," says Goodwin. "…Standards should not be the ends of education, but rather the beginning, the platform for creativity, innovation, and personalization."

• *Intervene early and get to the heart of the matter*. Step one is early intervention. "Learning difficulties are far simpler to address early," says Goodwin. "If left unchecked too long, learning difficulties may snowball to a point that even the most intensive (and costly) of interventions will produce, at best, mixed results… Unless educators begin to act proactively rather than reactively, they will remain in a perpetual state of emergency." Step two is addressing the deep causes of student performance: home environment, prior knowledge, interest, and motivation. "Educators should not consider students' environments, background knowledge, or motivation (which account for as much as 80% of the variance in student achievement) as being beyond their reach," says Goodwin. "Many programs and interventions have been shown to positively address all three, and they *must* be addressed to change the odds for students."

• *Create a high-performance school culture*. There is significant variance in the quality of instruction and classroom management among different teachers in the same school. Goodwin says that "leadership behaviors that focus on developing teachers appear to be much more powerful than those that focus on developing the organization. Thus, leaders would do well to focus attention and energies on improving classroom instruction." While working with individual teachers is important, it's also crucial to develop a schoolwide ethos of high expectations for academics and behavior. Exemplars are: "Be Kind, Work Hard, Get Smart" for students (the motto of E.L. Haynes School in Washington, D.C.), and "Can Do" for adults.

• *Develop data-driven, high-reliability systems*. This includes hiring effective teachers, setting clear, "no excuses" goals for teaching and learning and monitoring progress during each year, adopting a flexible yet consistent approach to instruction, supporting great teaching with individualized staff development, and ensuring great teaching through evaluation and accountability. "Just as an airline or nuclear power plant would never set a goal of being anything less than disaster free," says Goodwin, "school systems should focus on ensuring the success of 100 percent of their children." This means "developing a healthy preoccupation with failure, prevention, and intervention," he continues. "To be high-reliability organizations, school systems must adopt data and diagnostic systems that identify error patterns as soon as they occur, putting in place processes for responding to them, and learning from failures in the spirit of kaizen, or continuous improvement."

2. The Best Ways to Teach Math Concepts and Math Skills

"An important truth about the effectiveness of instructional methods is that particular methods are not, in general, effective or ineffective," say University of Delaware professor James Hiebert and University of Missouri professor Douglas Grouws in this article in *Better Evidence-Based Education*. "Instructional methods are effective for something. Educators always need to be clear about what this something is when they talk about the effectiveness of instructional methods."

So what are the best methods for teaching math conceptual understanding and skills? Hiebert and Grouws say the research has moved beyond the old debates (didactic versus discovery, direct instruction versus inquiry, student-centered versus teacher-centered, and traditional versus reform-based). Here are the best ways to approach each area:

• *Conceptual understanding* – Two classroom approaches are most effective in helping students construct meaningful relationships among mathematical facts, procedures, and ideas:

- Work and talk: "Teachers and students should intentionally and explicitly talk about and work on important mathematics relationships," say Hiebert and Grouws. This includes:
    - Examining relationships among facts, procedures, and ideas within a lesson and across lessons. *How are the problems we solved today similar to or different from those we solved yesterday?*
    - Exploring reasons why procedures work as they do. *Why do we usually add from right to left? Why must we do the same thing to both sides of an equation?*
    - Solving problems using different procedures and then looking at similarities and differences between them.
- Work and wrestle: It's important for students to work hard on key math ideas that they don't know how to solve yet.
    - Teachers should pose problems that are just beyond what students can handle – they have most of the prerequisite skills but something extra is needed.
    - The teacher should resist the tendency to jump in and help when students show signs of uncertainty.
    - Students should be asked to present their solution strategies for peer review of mathematical validity.

"It is well known that understanding develops as people try to resolve perplexities or dilemmas that cannot be immediately sorted out," say Hiebert and Grouws. "Wrestling with perplexing situations often results in rethinking ideas and creating new and better explanations for how things work."

• *Skill efficiency* – To help students master the rapid, smooth, and accurate execution of math procedures, research points to the following classroom approach:

- Skill classes should be fast-paced, well organized, and focused on math (versus discipline or handing back papers) to keep students' attention.
- The teacher should start by modeling the skill in a way that's clear, concise, and shows why it's important.
- During modeling, the teacher should pepper students with questions to be answered out loud for the whole class to hear.
- Once students know what to do, they should have plenty of time for error-free practice.

What about lessons that aim to target conceptual understanding *and* skills? Hiebert and Grouws suggest leaning toward the approaches that work for conceptual understanding, which seem to work for both areas (although the research on this isn't that solid yet).

"Which Instructional Methods Are Most Effective for Math?" by James Hiebert and Douglas Grouws in *Better Evidence-Based Education*, Fall 2009 (Vol. 2, #1, p. 10-11); to subscribe, go to http://betterevidence.org/us-edition/

Back to page one

3. Making Middle-School Math More Fun in Great Britain

In this article in *Better Evidence-Based Education*, British consultant Quentin Thompson says that math teaching in the middle-school years rarely gets beyond arithmetic and algebra "sums" – low-level basics (similar to learning grammar in English) that aren't what math is really about. Students who don't get into using and applying what they learn in math see no point in the subject, get bored, and don't see what fun it can be.

Thompson is working on Bowland Math, an initiative that aims to improve students' math motivation and achievement using three strategies:

• *New curriculum materials* – These focus on intriguing, real-world or fantasy-world problems that last 3-5 lessons each, for example:

- Explore cost-effective ways to reduce road accidents in a town.
- Investigate where hostile aliens have landed and find a way to escape and rescue a teacher.
- Design a healthy new smoothie fruit drink based on a survey of people's tastes.
- Plan an inter-galactic trip trading various goods.
- Examine ways to prevent the spread of a virus outbreak.

• *Professional development for teachers* – Modules to support teachers working with these kinds of problems have been distributed to schools in England and are available on the Web at http://www.bowlandmaths.org.uk.

• *Better assessments* – Bowland is developing 40 assessment tasks with scoring guides and examples of students' work.

What are the results so far? There's nothing very systematic yet, but preliminary feedback is positive – see https://www.ncetm.org.uk/community/2985.

"Bowland Math: Turning Theory Into Practice" by Quentin Thompson in *Better Evidence-Based Education*, Fall 2009 (Vol. 2, #1, p. 18-19); to subscribe, go to http://betterevidence.org/us-edition/

Back to page one

4. The Impact of Ability Grouping in Developed Countries' Schools

In this *Teachers College Record* article, University of Pittsburgh researcher Janet Ward Schofield asks whether ability grouping is widening or narrowing the achievement gap in secondary schools abroad. Numerous studies have shown a gap-widening effect in the U.S. – because, for example, teachers tend to assign less homework to lower-level classes than in higher-level classes, the curriculum is watered down, teachers' expectations are lower, and peer influences undercut achievement.

Schofield did an extensive survey of the literature on secondary schools in developed nations with heterogeneous populations, including Germany, the Netherlands, Israel, and New Zealand. She studied tiered schools (like the German system of *Gymnasium, Realschule*, and *Hauptschule*), hybrid systems (like Great Britain's, where many students are ability-grouped within comprehensive high schools), and egalitarian, non-tracked systems (like Sweden's). Here are her conclusions:

• Ability grouping tends to separate students along SES and ethnic lines, increasing the concentration of low-SES, minority, and immigrant students in lower-track classrooms.

• Ability grouping with curriculum differentiation benefits students who enter with higher achievement.

• Ability grouping with curriculum differentiation undermines the achievement of students who start out with lower achievement.

• Classroom dynamics within lower-track ability-grouped classes influence teachers' pedagogical choices and, says Schofield, "make it very hard to teach in a way that is conducive to maximizing lower achieving students' progress."

• Peer culture within lower-track classes often undermines achievement motivation and aspirations.

• Having high-achieving classmates is associated with increased achievement gains for lower-achieving students.

Thus, she says, "ability grouping with curriculum differentiation is likely to increase the achievement gap between these students and their more privileged peers."

"International Evidence on Ability Grouping with Curriculum Differentiation and the Achievement Gap in Secondary Schools" by Janet Ward Schofield in *Teachers College Record*, May 2010 (Vol. 112, #4, p. 1492-1528), no e-link

Back to page one

5. Creative Teaching of Two Novels in an Urban High School

In this *Teaching Exceptional Children Plus* case study, Hunter College professor David Connor and New York City teachers Sarah Bickens and Fran Bittman describe how they taught *The Great Gatsby* (1925) and *Native Son* (1945) in an inclusive New York City high school:

• *Essential questions* – These helped all types of students stay focused on larger themes and not get lost in minutia. Essential questions for *The Great Gatsby* included: What is the American Dream? Is it attainable for everyone? What values were apparent in post-World War I America? How does the bias of a narrator influence a novel's story? How do relationships

among characters contribute to the development of themes and plot? For *Native Son*, an essential question was: Can literature fight injustice?

• *Accountable talk* – When reading and discussing the books, students were required to prove their claims by referring to specific parts of the texts and engaging in close textual reading.

• *Marking up the text using Post-Its* – This helps students keep track of important, surprising, and unclear information in the books.

• *Small-group work for super-close reading* – Cooperative learning is "sadly underutilized" in secondary schools, say Connor, Bickens, and Bittman. They had small groups of students look closely at specific passages for symbols, imagery, and characterization, with each student making a contribution to the group's work.

• *Character analysis bio poem* – Pairs or groups of three students read a passage in which a character is first introduced and created a bio-poem to describe the character. For each poem line, students picked a quotation from the text that demonstrated their claim about the character. Finally, they acted out their poem for the class.

• *The setting: forging historical connections* – For example, students investigated Richard Wright's references to the Scottsboro case.

• *Imagery analysis: creating a visual* – "Oftentimes, the sheer volume of detail in novels such as *The Great Gatsby* overwhelms students," say Connor, Bickens, and Bittman. "However, a close reading can 'slow down' teens and allow them to revel in the beauty of Fitzgerald's language." They had pairs of students pick an image-rich passage and draw the scene, label it with language from the text, and share their work with the class.

• *Exploring media bias* – The teachers had students explore the obvious media bias in the news accounts of the murder of a white heiress in *Native Son*.

• *Using a crime scene investigation to make predictions* – Again from *Native Son*, teachers had students notice small details in the text and predict how the murder would be discovered.

• *Creating new beginnings* – Working in small groups, students chose a character to reinvent, creating an escape plan from the novel's setting that would allow the character to be free and alive in the end.

• *Basic organizers: focusing on a character's psychological make-up* – It's helpful for students to draw a picture of a character (for example, Bigger in *Native Son*) and draw thought balloons over his head with the major thoughts and conflicts in his life.

• *Using graphic organizers for logs: characterization and conflict* – Students kept a log of major events, charting a character's emotions as the plot unfolds. A chart included columns for events, a quote for each, what it shows about the character, and the change that took place.

• *Creative culminations* – After finishing a novel, students worked in groups with a choice of several roles to creatively wrap up the ideas of the book with humor and enjoyment.

• *Nuts and bolts: skill-building routines* – Connor, Bickens, and Bittman were careful not to neglect vocabulary, grammar, identifying components of literature, and note-taking so that students would be equipped to answer questions on the New York Regents exam.

To prepare students to write Regents essays, Connor, Bickens, and Bittman used provocative quotes to get students started – for example, "One's happiness is limited only by how one defines happiness" for *The Great Gatsby* and "All literature is protest" for *Native Son*. They then provided a basic structure, breaking down the components of an essay, and gave students step-by-step guidance, including a mnemonic: OTP for the introduction (opening statement, thesis statement, and preview of supporting evidence; TELEC for the body paragraphs (topic sentence, example illustrating topic sentence, literary device, explanation of how the example proves the thesis correct, and concluding sentence); and RRF for the conclusion (restate thesis, restate examples used, and final comment). Students also got packets with requirements and actual Regents questions to familiarize them with the format, rubrics, and lots of opportunities to revise and rewrite their drafts with teacher and peer support. Teachers gradually removed the scaffolding as the year progressed until students could write independently. Teachers had students keep portfolios of their work throughout their high-school years so they could refer back and review for Regents, SATs, and other exams.

"Combining Classic Literature with Creative Teaching for Essay Building in an Inclusive Urban High School Classroom" by David Connor, Sarah Bickens, and Fran Bittman in *Teaching Exceptional Children Plus*, July 2009 (Vol. 5, #6)
http://escholarship.bc.edu/education/tecplus/vol5/iss6/art3/

Back to page one

6. Depth Versus Breadth in High-School Science Classes – It Matters!

In this article in *Science Education*, University of Texas/Arlington professor Marc Schwartz and colleagues report on the link between 8,310 students' achievement in college science courses and the science curriculum they had in high school. It turns out that students whose high-school science teachers went into depth on at least one major topic (spending about a month on it) did better in introductory college biology, chemistry, and physics than students whose high-school science classes focused on breadth of coverage. The advantages of depth versus breadth were most pronounced in biology.

The researchers acknowledge that going into depth is potentially risky for high-school science teachers, since they are under pressure to cover an inordinately large number of topics and fear that students might not be prepared for some exam questions. It's true that skimming the surface on all topics helped students do well on standardized tests, but when those same students were in college science courses, high-school breadth was a disadvantage. Deeper coverage of a few topics paid off for thousands of students.

Why was this so? Schwartz and his co-researchers think it is connected to the difficulty of getting students to let go of misconceptions. "Most students hold conceptions that are at odds with those of their teachers or those of scientists," they write. "In general, students cling tenaciously to these ideas, even in the face of concerted efforts… Students do not quickly or easily change their naïve scientific conceptions, even when confronted with physical phenomena. However, given enough time and proper impetus, students can revise and rethink their ideas." Going into depth on one or two topics gives teachers the time to make this happen.

"Depth Versus Breadth: How Content Coverage in High School Science Courses Relates to Later Success in College Science Coursework" by Marc Schwartz, Philip Sadler, Gerhard Sonnert, and Robert Tai in *Science Education*, July 2009 (Vol. 93, #5, p. 798-826); Schwartz can be reached at schwarma@uta.edu; the article can be purchased at http://www3.interscience.wiley.com/user/accessdenied?ID=121580319&Act=2138&Code=4717&Page=/cgi-bin/fulltext/121580319/PDFSTART

Back to page one

7. Getting to Yes through Interest-Based Bargaining

This report by the National Commission on Teaching and America's Future describes successful union/district collaboration in Clark County, Nevada and Hamilton County, Tennessee. A sidebar highlights the efficacy of interest-based bargaining, giving a classic example derived from the work of Roger Fisher William Ury (*Getting to Yes*, 1981):

Four people are arguing over an orange and they all insist it should be theirs. Using traditional adversarial bargaining, all four would assert their rights and expectations and demand that the other three give in. In the end, an impartial arbitrator might be called in to listen to each person and award the orange to the most persuasive. One side would win and the others would go home unhappy.

But in interest-based bargaining, a neutral party would ask: *What are the interests or issues that are important to you?* and specifically, *Why is having the orange important?* This changes the dynamic, turning the adversaries into joint problem solvers in search of workable solutions to meet their needs and allay their fears.

Looking through the lens of interests, it turns out that one person wants the orange to demonstrate his juggling skills to a friend; the second wants the juice for her child; the third wants to plant the seeds; and the fourth wants the inner skin for a fiber-rich snack. With these facts on the table, it doesn't take long to work out a solution that satisfies all four:

- The first person is given 30 minutes to use the orange for his juggling act.
- Then the orange is cut open and the juice squeezed out for the second person.
- The seeds are given to the third person.
- And the remaining hull of the orange provides the fourth person's snack.

All four are pleased with the process and the outcome, and will be that much more receptive to future "negotiations" over issues large and small.

"The Power of Collaboration: Interest-Based Bargaining" – a sidebar in *Reducing the Achievement Gap Through District/Union Collaboration: The Tale of Two School Districts*, National Commission on Teaching and America's Future, November 2007 (p. 5)
http://www.nctaf.org/resources/research_and_reports/nctaf_research_reports/documents/ReducingtheAchievementGapFullReportFinal.pdf

Back to page one

8. Why Moving to a Better Neighborhood Is Not Enough

In this *Teachers College Record* article, Johns Hopkins University researchers Stefanie DeLuca and Peter Rosenblatt examine the results of Moving to Opportunity (MTO), a program that gave low-income families the opportunity to move to wealthier communities and send

their children to better schools. Looking at the program in Baltimore, Deluca and Rosenblatt found that the program made little difference in the quality of education children received. Their conclusion is that better housing conditions are necessary but not sufficient. Families mired in multi-generational poverty need additional support: mental health services, social services, advice on finding the best school, and active outreach from educators to help their children succeed in a new setting. "Years of failed urban school reform efforts, limited housing opportunities, and concentrated residential poverty only exacerbate the passive orientations that low-income families have toward schooling," they conclude. "Our findings underscore the need to consider both housing and education policy together for viable remedies that will lead to improved outcomes for children."

"Does Moving to Better Neighborhoods Lead to Better Schooling Opportunities? Parental School Choice in an Experimental Housing Voucher Program" by Stefanie DeLuca and Peter Rosenblatt in *Teachers College Record*, May 2010 (Vol. 112, #4, p. 1443-1491), no e-link

Back to page one

9. Short Item:

A map of states that have adopted the Common Core Standards – The Thomas B. Fordham Institute has a continuously updated map showing which states have adopted the voluntary national standards for English language arts and math:
http://edexcellence.net/index.cfm/common-core-state-standards-primer

Spotted in *Education Gadfly*, July 8, 2010 (Vol. 10, #24)

Back to page one

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 effective practices in K-12 education. Kim Marshall, drawing on 37 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 44 carefully-chosen publications (see list to the right), sifts through more than a hundred 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 evening (with occasional breaks; there are about 50 issues a year).

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- How to change access e-mail or password

Publications covered

Those read this week are underlined.

American Educator
American Journal of Education
American School Board Journal
ASCD, CEC SmartBriefs, Daily EdNews
Catalyst Chicago
Ed. Magazine
EDge
Education Digest
Education Gadfly
Education Next
Education Week
Educational Leadership
Educational Researcher
Edutopia
Elementary School Journal
Essential Teacher (TESOL)
Harvard Business Review
Harvard Education Letter
Harvard Educational Review
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Journal of Staff Development
Language Learner (NABE)
Middle Ground
Middle School Journal
New York Times
Newsweek
PEN Weekly NewsBlast
Phi Delta Kappan
Principal
Principal Leadership
Principal's Research Review
Reading Research Quarterly
Reading Today
Rethinking Schools
Review of Educational Research
Teachers College Record
The Atlantic Monthly
The Chronicle of Higher Education
The Language Educator
The Learning Principal
The New Yorker
The Reading Teacher
Theory Into Practice
Tools for Schools