Marshall Memo 317

A Weekly Round-up of Important Ideas and Research in K-12 Education
January 4, 2010

In This Issue:

Quotes of the Week

"… I have to work hard not to show my active discomfort when graduate students come to me and say, 'I have worked in schools for a few years, and now I am ready to start to shape policy.' Every fiber of my being wants to say, 'Use your time in graduate school to become a better practitioner and get back into schools as quickly as possible. You will have a much more profound effect on the education sector working in schools than you will ever have as a policy actor.'"

Richard Elmore (see item #4)

"I now care much less about what people say they believe, and much more about what I observe them to be doing and their willingness to engage in practices that are deeply unfamiliar to them."

Richard Elmore (*ibid.*)

"If you can't tell your teachers about yourself and what you want to do, how are you going to do it with your boss?"

Jane Collins, talking about high-school students with special needs (see item #5)

"They decide they're no good at math – 'I'm not a math person,' they say – and pretty soon the school agrees, the parents agree, everyone agrees."

Doug Clements (see item #2)

"Children's temperament also influences how teachers treat them at least as early as first grade. That has ramifications for later academic success."

Claire Vallotton (see item #6)

1. What Kind of Learning Works Best?

In this thoughtful and clearly written article in *American Educational Research Journal*, a team of German and Dutch researchers reports on a study of how students learn using four different instructional approaches. All four claim to be effective at getting students actively selecting relevant information, organizing it in their minds, and integrating it with what they already know. Here are the teaching approaches, as seen from the student's point of view:

a. *Tell* me how it works – traditional expository instruction enhanced by presenting information in a variety of ways;
b. *Show* me how it works – the expert's strategy is gradually laid out for learners (this is sometimes called cognitive apprenticeship);
c. Let *me* explain how it works – learners are asked to reflect and explain principles from the learning material themselves;
d. Let me *investigate* how it works – students learn by performing investigations.

The researchers note that under normal circumstances, it's very difficult to disentangle the merits of an instructional approach from the talents and contributions of individual teachers. So they decided to factor out teaching as a variable by studying the four approaches as students worked with interactive computer instructional programs, all teaching mathematical probability theory to the 10^{th} and 11^{th} graders:

a. *Hypermedia learning* (tell me) – Text, pictures, animation, and video elements are presented in nodes interconnected by hyperlinks; students are free to decide which piece of information they want to select and observe, and can work at their own sequence and pace.
b. *Observational learning* (show me) – The computer program allows students to observe experts performing a task or solving a problem.
c. *Self-explanation-based learning* (let me explain) – Worked-out examples are presented without the solution steps and students themselves type in explanations of how to work out the steps.
d. *Inquiry learning* (let me investigate) – Students inductively come up with the answers by interacting with the subject matter.

Each of these approaches has strengths and weaknesses, and the researchers wanted to know

which worked best as judged by students' acquisition of conceptual, intuitive, procedural, and situational knowledge.

And the winner was… (c) the self-explanation approach. Students who used this learning program ended up with the most impressive results across the board. The hypermedia and observational approaches produced the lowest results, and the inquiry approach was in between. The only downside of self-explanation was that it took more time, whereas the hypermedia software was quickest. The researchers sum up their findings thus:

- Having students generate parts of the subject matter leads to better performance than just telling them.
- This positive effect influences all types of knowledge.
- This positive effect is largest when students generate self-explanations in combination with worked-out examples.
- This positive effect takes more time than direct instruction.

So, given sufficient time, self-explanation is the way to go – although, if they could redesign the experiment, the researchers suspect that a combination of self-explanation and inquiry would do even better.

The authors sum up by saying that "cognitive activity does not necessarily occur spontaneously in practical situations, but needs to be stimulated. Approaches that take this into account by prompting learners to self-explain or stimulating them to hypothesize, experiment, and investigate in a simulation have now proved to be more effective than approaches that do not explicitly ask for cognitive activity."

Can the self-explanation approach be made more time-efficient? The authors believe it can by (a) giving students several explanation options to choose from, (b) training students in coming up with hypotheses so they can do so more quickly, and (c) restricting time so there is an action-forcing deadline to come up with explanations.

"Learner Performance in Multimedia Learning Arrangements: An Analysis Across Instructional Approaches" by Tessa Eysink, Kirsten Berthold, Bas Kolloffel, Maria Opfermann, and Pieter Wouters in *American Educational Research Journal*, December 2009 (Vol. 46, #4, p. 1107-1149), no e-link available; Eysink can be reached at T.H.S.Eysink@utwente.nl.

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2. Teaching More Challenging Mathematics in Preschool

In this front-page *New York Times* story, Benedict Carey describes new thinking on the importance of enriching preschool math. Researchers Julie Sarama and Doug Clements of the University of Buffalo have documented the paucity of mathematical content students generally learn before kindergarten and the long-term impact this has, especially on low-SES children. "They decide they're no good at math – 'I'm not a math person,' they say – and pretty soon the school agrees, the parents agree, everyone agrees," says Clements. So he and Sarama developed Building Blocks, which is designed to boost the math concepts and skills of children in this age-group. The program is now being tested in more than 400 classrooms. Building

Blocks integrates numbers into every aspect of the classroom – artwork, computer games, lessons – in the same way that literacy teachers incorporate letters and words. Children play creative counting games and also learn number skills like one-to-one correspondence.

Experts believe that preschool children's brains can handle large numbers and are striving to master three key closely related concepts:

- Physical quantity (seven marbles, seven inches)
- Abstract digit symbols (7)
- The word that corresponds to each number (seven)

Fusing this trio is essential to success in kindergarten. Building Blocks and other new preschool programs try to accomplish this by relating numbers to physical activity, for example, having students play *Chutes and Ladders*. "Counting, by contrast, is very abstract," says Sharon Griffin of Clark University in Massachusetts. So is telling students that 8 is two times bigger than 4, says psychologist Robert Siegler. It's better to have children see that it's twice as far to the number 8, and it takes twice as long to get there.

Brain imaging studies have shown that in the parietal cortex just above the ears, there are discrete areas that respond to seeing different quantities (for example, a flash-card with five dots fires up one area, a three-dot card fires up a different one). "This is what we believe focused math education does," says Stanislas Dehaene, a cognitive neuro-scientist at the College de France in Paris. "It sharpens the firing of these quantity neurons." Practice helps children become increasingly proficient at instantly recognizing quantities of objects and connecting them to the language areas of the brain ("five", "three"). This is similar to the honing process that takes place in another part of the brain as children link letter shapes and associated sounds. All this takes longer than researchers once thought: studies suggest that the fusing of letters and sounds isn't complete until the age of eleven.

"In math, there is no faking it," says Carey. "Children either know that five is more than three, or they do not. Either they can put number symbols in exactly the right order or they cannot." It appears that all this can be taught; preliminary results in Building Blocks pilot classrooms are encouraging, with students scoring significantly higher than those not exposed to the program. In one videotaped interview with a student who had been taught with the program for six months, he immediately said there were ten pennies when they were put in front of him, without needing to count them. He easily matched number cards to corresponding cards with pictures of grapes and put mixed-up numerals in the right order. A teacher asked him, "What's the biggest, nine or seven or five?" The boy thought for a moment and then said, "Nine. Five is the littlest." Holding up one palm above the other, he said, "Five is like this. See?" Watching the video, Building Blocks author Clements exclaimed, "Do you see what he's doing? Right there. He wants to explain. He wants to explain five."

"Studying Young Minds, and How to Teach Them" by Benedict Carey in *The New York Times*, Dec. 21, 2009 (p. A1, A23)
http://www.nytimes.com/2009/12/21/health/research/21brain.html?_r=1&scp=1&sq=Studying%20Young%20Minds,%20and%20How%20to%20Teach%20Them&st=cse

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3. A Massachusetts High School's Students Write and Produce Films

In this *Principal Leadership* article, Walpole High School (MA) principal Alan Bernstein and English teacher Michael Alan describe an annual film festival that is now in its eighth year at their school. The event began as an extracurricular club and, assisted by a grant from a local computer foundation, morphed into a pair of English electives and then a schoolwide cultural event combining drama, dance, graphic design, journalism, music, and technology. Here's the sequence each year:

• In the two English courses, "screenwriters" pitch script ideas to the teacher (who is also the director of the film festival) in hopes that one of the "directors" in the class will turn them into movies. Some of the "directors" write scripts too, and students not enrolled in the classes can be "independent" scriptwriters. Once a concept is approved, students begin writing in earnest, focusing on plot structure, outlining, and scene-by-scene coherence. After much feedback and editing, final drafts are printed for review by potential directors.

• While scripts are being written, students in a parallel film course are studying preproduction, including storyboarding (shot-by-shot sketching of each scene), casting, scheduling, camera technique, composing shots, editing, using Final Cut Pro 6 software, special effects, and music.

• With preproduction training behind them, students in the film course choose their scripts and form crews of five or six – an art director, a music director, a cameraperson, and film editors (with some flexibility between the roles). They all write vision papers to describe how each scene should look and then combine their ideas into an overall scheme to guide the rewriting of the script, costume and set design, casting, and camera-work.

• Individual crew members then work with art teachers on sets and music teachers on the score while others work with actors and scheduling. Crews spend 3-4 months (mostly during class time but also after hours) on casting (faculty members are often chosen for offbeat roles), rehearsing, finding appropriate locations and sets, and filming.

• Crews then edit their raw footage using the Final Cut Pro 6 software and add the musical score (which must be original music). Films include comedies, spoofs, serious dramas, and sophisticated musicals. Most of the feature films end up being about 25 minutes long.

• Finally it's time for the film festival, which takes place over three to four evenings in May and is always completely sold out. All films are shown, and on the final day, the winners in each category (best picture, best director, best actor, best supporting actor, best screenplay, best faculty performance, best editing, best short film, best art direction, and best original music) are nominated and chosen by the 21-member "academy" made up of faculty, staff members, students, and community members.

• On the last night, it's time to announce the winners, complete with a red carpet, limousines, local press, and journalism students playing the paparazzi, photographing and interviewing the winners and publishing their stories in the school's newspaper. There are also short films, faux trailers of "upcoming movies," a video documentary on the making of that year's films, and a performance by the school's dance company.

This whole process is almost entirely self-supporting financially, except for the site licenses for software and faculty stipends, which come from the school budget. An active website solicits donations and has information about moviemaking and past nominees and winners.

"Lights! Camera! Action!" by Alan Bernstein and Michael Alan in *Principal Leadership*, November 2009 (Vol. 10, 3, p. 24-28), no e-link available; the authors can be reached at albern@hs.walpole.ma.us and malan@walpole.k12.ma.us. The film festival's website is http://www.walpolefilmfestival.com.

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4. Changing Beliefs in a Tumultuous Time

In this *Harvard Education Letter* article, education professor Richard Elmore describes some ways his thinking has evolved over the years:

• *On policy initiatives* – Elmore used to think that federal and state educational policy decisions had a positive effect. Now he believes that the policy system has run amok and is actually harming schools. Why? Because policy makers and the general public don't respect the expertise of educators, and as a result, a lot of half-baked ideas are foisted on schools. This is why Elmore now spends his time trying to strengthen what he calls the "extremely weak professional culture" of American schools, and urges others to do the same. When graduate students say to him, "I have worked in schools for a few years, and now I am ready to start to shape policy," he winces. The message he wants to give these starry-eyed young professionals is, "Use your time in graduate school to become a better practitioner and get back into schools as quickly as possible. You will have a much more profound effect on the education sector working in schools than you will ever have as a policy actor."

• *On beliefs guiding actions* – Elmore says he used to think that ideas shaped behavior, which suggested that one of the best ways to improve results was to ratchet up teachers' expectations about what children could learn. "The accumulated evidence, I regret to say, does not support this view," he says. "People's espoused beliefs – about race, and about how children learn, for example – are not very influential in determining how most people actually behave. The largest determinant of how people practice is how they have practiced in the past, and people demonstrate an amazingly resilient capacity to relabel their existing practices with whatever ideas are currently in vogue… I now care much less about what people say they believe, and much more about what I observe them to be doing and their willingness to engage in practices that are deeply unfamiliar to them."

New beliefs take hold, says Elmore, when we experiment with new ways of doing things, pushing the envelope of our knowledge and competencies. For example, when teachers ask students to do work that seems "too hard," they are often surprised to find that students can do it. "In these cases," he says, "adult beliefs about what children can learn are changed by watching students do things that the adults didn't believe that they – the students – could do."

• *Altruism* – Despite the fact that many educators say, "We're in it for the kids," Elmore has come to believe that most people act out of self-interest. The responsible position, he says,

is to know what one's own interests are, listen to and understand the interests of one's clients (which are often not the same), and deal honestly and responsibly with one's own role. "The great leaders of social transformation," he says, "Gandhi, Martin Luther King Jr., Nelson Mandela – led by providing an opportunity for people to bring their voices and actions to a common endeavor – not by confusing their own interests with those of the people they hoped to help."

"'I Used to Think… and Now I Think…'" by Richard Elmore in *Harvard Education Letter*, January/February 2010 (Vol. 26, #1, p. 8, 7) http://www.edletter.org

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5. Preparing Special-Needs Students for Success in College

In this *Harvard Education Letter* article, writer David McKay Wilson says that when students with special needs enter college, they often fail to describe their disability and ask officials and professors for accommodations. "Many students say they have a disability, but they don't know what it is," says Lynne Golden at the University of Hartford. "Others say they've never read their records. In K-12, they've learned to talk about their strengths, but these students can't talk about their weaknesses… I get kids in my office who can't talk about what they need." University of Northern Iowa professor Greg Stefanich agrees: "Students get such strong support in high school from their families and schools that these students don't learn how to make autonomous decisions. They can become passive."

In elementary and secondary schools, students are *entitled* to special supports; in college, they are *eligible* under Section 504 and the Americans with Disabilities Act (ADA), but to get services, they have to say they're disabled (55 percent of special-needs students in one study failed to do this), prove their disability, and ask for accommodations. To be successful in college, students with disabilities need:

- Solid documentation to prove their disability to college officials. "It needs to be specific," says Golden. "We need a diagnosis."
- The ability to advocate for themselves;
- Confidence and assertiveness making independent decisions about their education;
- Mastery of the latest technological aids to cope with college-level reading and writing.

What can high schools do to prepare special-needs students more effectively? One approach, starting as early as ninth grade, is having students take a leadership role in the annual meeting to review their IEP and set goals for the year ahead. Typically, students speak only 3 percent of the time at these meetings; in self-directed IEP meetings, students are much more active, which means they need to be better informed. "This teaches them to clearly articulate, to a group of professional educators, what their needs and goals are," says James Martin of the University of Oklahoma. "This helps them own it. These are foundational skills that they need to know to get ready for life after high school." Jane Collins, a vocational coordinator for special education in Normal, Illinois says that their IEP meetings have come to resemble final

exams. "If you can't tell your teachers about yourself and what you want to do, how are you going to do it with your boss?"

One of the trickiest decisions for students with special needs is choosing the college with the right level of support – not too little and not too much. Students may need accommodations on tests to thrive in college, says Margaretha Izzo of Ohio State University, but too many supports in college can make it difficult for a student to succeed in the workplace. Some colleges are less willing to provide accommodations than high schools, and students may want to dial back on their demands to prepare for life after college. "Being persistent in life leads to being able to manage situations that arise in living, working, and having relationships," says Izzo.

"From Special Ed to Higher Ed: Transition Planning for Disabled Students Focuses on Advocacy Skills" by David McKay Wilson in *Harvard Education Letter*, January/February 2010 (Vol. 26, #1, p. 4-6) http://www.edletter.org

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6. How Children Shape Their Own Environment – Not Always for the Best

In this *Newsweek* column, science correspondent Sharon Begley reports on research indicating that certain traits that infants inherit – fussiness or homeliness, for example – can affect how adults treat them. Studies show that parents are less responsive to fussy, crying babies and more affectionate towards attractive babies. "Children's temperament also influences how teachers treat them at least as early as first grade," says Michigan State University psychologist Claire Vallotton. "That has ramifications for later academic success." Valloton's research shows that the more responsive babies are, the more likely caregivers are to make eye contact, talk, and get down on the floor to interact with them – all of which boosts the intelligence and self-esteem of the babies.

Begley says there isn't a lot of research on this feedback loop yet, but she is troubled by the idea that inherited traits can create a less supportive environment for some children based on things beyond their control. "If so," she writes, "we are mistakenly attributing these outcomes to genes 'for' intelligence and the rest, when in fact all the genes do is give a child looks or temperament that elicits, for instance, IQ-boosting responses from adults."

"That's important," Begley concludes, "for the obvious reason that adults, armed with this knowledge, can learn to treat all children – not just the cuties who so easily bring out the best in us – in a way that nurtures their hearts and minds to develop to their fullest."

"It's in Our Genes. So What? DNA Takes You Only So Far" by Sharon Begley in *Newsweek*, Dec. 7, 2009 (p. 36) http://www.newsweek.com/id/224359

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7. Boosting Students' Mindfulness

In this *Teachers College Record* article, Elizabeth Reid and Lisa Miller tell a classic story of students not being "mindful": second graders are presented with the following

problem: *There are 26 sheep and 10 goats on a ship. How old is the captain?* Not a single student saw that the question made no sense; all of them accepted the information without considering other possible understandings or perspectives. The authors quote Ellen Langer saying that "schools must focus more on developing understanding than imparting knowledge and skills through mere practice and repetition… Mindfulness means stepping outside of those grooves."

Reid and Miller then describe an action research project in which a group of 24 low-SES Connecticut fourth graders worked with a book entitled *Seymour N.B. Mack's Top Secret Detective Manual* as they attended a summer program. In a portion of each day, students worked in teams following the exercises in the book, with very little teacher involvement. The book got them exploring their school environment like detectives, using one of their five senses each week. For example, one activity under Seeing is: *Draw a diagram of the outside of your school. Then go back and find what you are missing. Did you notice that the flowers are red or that there is a window above the door?* An activity under Touch: *With your eyes closed, can you figure out whose hand you are shaking merely by feeling it? How did you figure it out, or why was it easy or difficult to do?* Students also read a book about Helen Keller and watched the movie, *The Miracle Worker*. Students enjoyed being detectives, incorporated the word *mindful* into their vocabularies, and related strongly to Helen Keller's story.

Students were given a number of assessments before and after the summer program: the Perceived Competence for Learning scale, Curiosity and Exploration Inventory, the Rosenberg Self-Esteem scale, and the Mindful Attention Awareness scale. The biggest improvements in the students who used the detective manual were in increased mindfulness; gains on the other assessments were moderate or negligible, and students with the lowest pre-test scores made the biggest gains. Paradoxically, students with the highest pre-test scores scored lower on the post-tests.

Reid and Miller conclude by saying that more research needs to be done in this area. "Imagine a classroom where students see themselves as mindful detectives who are coming to learn from each other and themselves, to explore possibilities, to question, to consider other perspectives, and to be accepted as they are in that moment. Imagine if children became mindful detectives of all subject areas – math, science, English, art, soccer…"

"An Explanation of Mindfulness: Classroom of Detectives" by Elizabeth Reid and Lisa Miller in *Teachers College Record*, December 2009 (Vol. 111, #12, p. 2775-2785), no e-link available

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8. Short Items:

a. Project Explorer website – This nonprofit-sponsored website hosts virtual field trips to England, Jordan, and South Africa and includes short films and other material explaining the region's food, music, culture, and language: http://www.projectexplorer.org.

"Go-To Sites: A Web Roundup" by Tim Ebner in *Digital Directions*, Fall 2009 (p. 8)

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b. Shakespeare website – On this extraordinary website created by the Folger Shakespeare Library in Washington, you can search all of Shakespeare's plays and sonnets for words, phrases, characters, topics, and themes (for example, love): http://shakespeare.clusty.com.

"Go-To Sites: A Web Roundup" by Tim Ebner in *Digital Directions*, Fall 2009 (p. 8)

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c. Grants website – The Grant Wrangler site has a free listing of grants available to K-12 schools and teachers, searchable by keyword and deadline: http://www.grantwrangler.com. Educators can also subscribe to a daily e-mail blast with updates, and can download a widget to post on a school or district Web page, making it easier to track grants.

"Go-To Sites: A Web Roundup" by Tim Ebner in *Digital Directions*, Fall 2009 (p. 8)

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d. Using cell phones as "clickers" – In this article in *The Language Educator*, Maura Kate Hallam recommends a free service that allows teachers or administrators to pose questions to a classroom or a larger audience, have people respond via their cell phones, and see responses instantly tabulated and displayed in a PowerPoint. Check it out at http://www.polleverywhere.com.

"Tech Tools for Language Learning – Computers and Beyond" by Maura Kate Hallam in *The Language Educator*, November 2009 (Vol. 4, #6, p. 28-30)

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e. Foreign language websites – These websites are recommended in *The Language Educator*:

- An online dictionary for 11 languages: http://www.lingro.com
- Reading is Fundamental in Spanish: http://www.rif.org
- Interactive Spanish exercises: http://www.asisehace.net
- Periodic table in different languages: http://www.periodictableontheweb.com
- Chinese for travel: http://www.chinesefortravel.com
- Japanese student life unit: http://www.coflt.net/scott/japanesestudentlife
- Walk, Talk, and Learn French: http://coffeebreakspanish.typepad.com/wtlfrench
- French online grammar quiz: http://fog.ccsf.cc.ca.us/~creitan/grammar.htm
- Latin best practices wiki: http://latinbestpractices.pbworks.com

Spotted in "Web Watch" in *The Language Educator*, November 2009 (Vol. 4, #6, p. 60-61)

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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).

Subscriptions:

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- The current issue (in PDF or Word format)
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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
Changing Schools (McREL)
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
JESPAR
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
Teacher Magazine (online)
Teachers College Record
The Atlantic Monthly
The Language Educator
The New Yorker
The Reading Teacher
Theory Into Practice
Tools for Schools/The Learning Principal