Marshall Memo 173

A Weekly Round-up of Important Ideas and Research in K-12 Education
February 19, 2007

In This Issue:

Quotes of the Week

"Diversity is a gold mine. It offers all members of a diverse group multiple ideas, perspectives, and solutions to problems."

Jennifer Carolan and Abigail Guinn (see items #2)

"Designing and facilitating multiple paths to reach defined learning goals is one of the hallmarks of successful differentiation. [But] 'multiple paths' does not mean that students are given free rein; it means that teachers must find that sweet spot between structure and choice that makes student learning possible."

Jennifer Carolan and Abigail Guinn (*ibid.*)

"I'm not the smart Asian. I guess I got the dumb gene."

An Asian high-school student, on his weakness in math (see item #5)

"Assuming that there is only one 'right' way to learn – or to walk, talk, paint, read, and write – is the root of fundamental inequities."

Thomas Hehir in *Educational Leadership*, Feb. 2007 (Vol. 64, #5, p. 12)

"The most damaging ableist assumption is the belief that people with disabilities are not intellectually capable. Therefore, although performance on a high-stakes test should not be the only means through which students with disabilities can demonstrate what they know and are able to do, the requirement to include students with disabilities in standards-based reform holds promise."

Thomas Hehir (*ibid.*, p. 13)

1. How Can We Help Students Do Their Best Work On State Tests?

This *Educational Researcher* article by a team of four researchers explores what is going on inside students' heads as they sit down to take high-stakes math tests – and the ways in which it affects how they do. "Individuals' beliefs and goals form qualitatively distinct motivational frameworks," they write, "leading to differential trajectories of cognitive engagement, affect, and performance."

The researchers interviewed a number of middle-school students who were performing moderately well or very well in math and analyzed several dimensions of their psychological state as they took math tests:

• *Achievement orientation* – There are two dimensions, which students usually pick up from parents and teachers: (a) a mastery approach (comparing oneself to an external standard), or (b) a performance approach (comparing oneself to other students). Within each of these, students can be focused on success – or on avoiding failure. Combining these dimensions, the researchers sorted students into these categories:

- Mastery/aiming for success: students with this orientation focus on mastering a task, meeting a challenge, and becoming more competent, often comparing their performance to how they did on previous tests.
- Mastery/avoiding failure: these students want to do well and avoid feeling "stupid" – but in comparison to their own performance, not other students'.
- Performance/aiming for success: students with this orientation want to look smart and "beat out" other students in the class.
- Performance/avoiding failure: these students feel they are being compared to other students and want to avoid being embarrassed and looking less smart than their peers.

These belief systems correlate with student performance on tests: students in the first category tend to do best, while students in the fourth category tend to do worst.

• *Value* – There are three dimensions to the value a student places on doing well on a high-stakes test: (a) importance – does doing well confirm or disconfirm a central part of his or her identity? (b) utility – does success mean anything to future aspirations? and (c) interest – does the test have intrinsic enjoyment or challenge? Here are some quotes from the study:

- "I want to do well because I am in sports and you have to have good grades for eligibility."
- "I want to do well because I just love math so much."

- "I know if I don't pass math I don't graduate and it is like very serious because I know I want to graduate."

The value students place on math, and their interest in it, has an important impact on their mind-set as they sit for math tests.

• *Self-concept* – Research on achievement motivation has sorted students' feelings about their competence into two categories: (a) academic self-concept – a generalized view of how good they are at schoolwork; and (b) domain self-concept – how good they are at English, math, and other subjects. Some quotes from the study:

- "Well, I'm really not good in math… I don't generally do well in math even though I try."
- "Math is like my best subject, and I just listen in class and remember everything."
- "Math is annoying… I am not very good at it… I think math is my worst subject so a test is a big deal."

Domain self-concept is often linked to how well students do on tests, but girls who do well in math tend to have lower opinions of their competence than boys at the same achievement levels.

• *Self-efficacy* – This is a student's sense of his or her ability to successfully execute behaviors to bring about a desired outcome, especially when the task is challenging. Self-efficacy develops over time as students encounter challenging work in different subject areas. Students with low self-efficacy will avoid the challenge or give up more easily. Some quotes:

- "I figured I would get them wrong… Yeah, because if I know I'm going to get them wrong I just kind of think why bother trying."
- "Through other parts of it, I was reassured about the questions that I absolutely thought I knew so it kind of helped me feel better about the rest of it."
- "When I don't know how to go about an answer… I try to be optimistic. I can start freaking out, getting frustrated, or I can be creative and try to create an answer… if I find myself frustrated, I'm like 'Stop and create a system'… so I just find a way."

It's interesting that success on a few test items during a test can spur efficacious thinking and help some students persist when they encounter more difficult problems. "Above and beyond 'actual' achievement," write the researchers, "beliefs that one can successfully bring about a positive outcome if one tries are important." Studies have found some gender differences in this area, with girls having a lower sense of self-efficacy than boys starting in middle school and the gap widening in high school.

• *Test anxiety* – This has two dimensions: (a) worry – self-criticism and concern about consequences; and (b) emotionality – physiological reactions like nervousness and sweating. Both can distract students from concentrating on the test and doing their best. Some quotes:

- "Usually tests make me nervous… Kind of anxious like I had to hurry and then when I hurry I might not get the right answer. Like I'm worried about making the time or falling behind the other kids or something… if they're all done before me, I feel like I am not doing it correctly."

- "Well usually, when I take tests in the beginning when I used to take them, I feel like oh! I was more relaxed for it so I scored higher but now like we prepare two weeks ahead of time it's more like I'm more nervous when I first take it."
- "At first it made me [anxious]… my hands are shaking and my heart was beating but then I calmed down when they told me it wasn't for a grade so I was OK."

Higher levels of anxiety during a test are linked to lower achievement, the researchers report, and students who worry about how they are doing in comparison to other students and are oriented toward avoiding failure tend to get more anxious during tests – which undermines their sense of competence and self-efficacy and their performance.

• *Cognitive strategies during tests* – The researchers identify three phenomena that occur while students are taking tests: (a) deep processing – critical thinking, integrating new information with prior knowledge; (b) surface processing – remembering class instructions and other information and using formulas; and (c) cognitive disorganization – distracting thoughts and worrying about the amount of time taken to solve a problem. Some quotes from students recalling what they were thinking:

- "My mind wanders and I was thinking about other things when I'm at a hard math problem… Because I kinda get confused by some of them."
- "I didn't really feel like I had enough time to finish it… I probably would have spent more time and got a better answer."
- "I try to do those and use the formulas to do those math problems."

Students who felt academically helpless (a combination of low self-efficacy, low domain self-concept, and performance/failure avoidance) had the most difficulty doing their best work during math tests: they used less factual information, didn't make predictions or explain concepts, and didn't monitor their own performance.

• *Stereotype threat* – This happens when something in the testing situation activates negative beliefs that certain groups think society has about them (e.g., girls aren't as good at math as boys) and disables their ability to use effective cognitive strategies during the test. Studies have shown that stereotype threat undermines test performance.

The article concludes by stressing that many of these factors can prevent students from doing their best work on high-stakes tests. The researchers don't have any magic bullets – and issue a call for more research. However, their analysis is suggestive of ways that principals and teachers can work with students to overcome some of these barriers and maximize their performance.

"Students' Motivation for Standardized Math Exams" by Katherine Ryan, Allison Ryan, Keena Arbuthnot, and Maurice Samuels in *Educational Researcher*, Jan./Feb. 2007 (Vol. 36, #1, p. 5-13), no e-link available

2. Differentiated Instruction – Watching the Masters At Work

In this thoughtful *Educational Leadership* article, Jennifer Carolan and Abigail Guinn, a California researcher and a school administrator, have a theory about why so many teachers are leery of differentiated instruction. First, teachers may resent differentiation as "another

bureaucratic mandate" from on high. Second, they often feel they don't have enough time, resources, and administrative support to differentiate effectively. Third, many teachers buy into the myth that differentiation means turning their classrooms into a dinner buffet – teaching everything three different ways. "This is not differentiation," say Carolan and Guinn, "nor is it practical." They go on to describe the ways in which five master middle-school teachers differentiate instruction. The teachers, all in a district near San Francisco, had diverse classes that included mainstreamed students with ADHD, severe hearing loss, and physical disabilities. Here are five key areas in which the master teachers excelled:

• *Belief* – The teachers brought to their work a strong belief in the value of the diversity of their students. "Diversity is a gold mine," say the authors. "It offers all members of a diverse group multiple ideas, perspectives, and solutions to problems. Teachers can nurture this diversity early on by maximizing the potential of each student in their classrooms, including students who come to the class with defined disabilities."

• *Personalized scaffolding* – The master teachers worked hard to understand their students and drew on their own rich experience to offer individual students metaphors, explanations, and other temporary supports that helped bridge gaps in understanding. This required managing their classrooms in ways that allowed them to spend one-on-one time with students as needed.

• *Multiple pathways to reach common goals* – The teachers in the study were clear about what all students needed to know, understand, and be able to do by the end of each curriculum unit. They used backwards design to plan their teaching, and they taught in ways that allowed different students to reach common goals in a variety of ways. "Designing and facilitating multiple paths to reach defined learning goals is one of the hallmarks of successful differentiation," say Carolan and Guinn. "[But] 'multiple paths' does not mean that students are given free rein; it means that teachers must find that sweet spot between structure and choice that makes student learning possible." Diverse approaches are especially important for students with special needs; the master teachers took advantage of strong areas in students' achievement profiles to help them understand and grow.

• *Hooking students through subject-area expertise* – Watching the five teachers, it was clear that they were tapping into deep knowledge of their subject areas as they made the curriculum content vivid and compelling to students. For example, one eighth-grade math teacher kicked off a unit on probability by describing a high-stakes basketball game between the Los Angeles Lakers and the Miami Heat in which Shaq has two free throws that could decide the game; the teacher gave students Shaq's shooting percentage on free-throws and asked students to predict the outcome of the game using words, diagrams, or arithmetic.

• *Caring classrooms* – The affective side of differentiation has often been neglected, say Carolan and Guinn. They believe that creating a safe, democratic, inclusive, and supportive climate is vital to meeting the academic needs of all students. "Rather than seeing differences in ability, culture, language, or interests as hurdles," write the authors, "these teachers turned differences into assets." Much of this came from the teachers' actions, which students noticed and emulated.

Carolan and Guinn conclude by urging schools and districts to create opportunities for more teachers to see masters at work – by pairing novice teachers with master teachers in formal mentoring relationships, by organizing visits to expert classrooms, or by arranging to have teachers view videotapes of master lessons. Teachers need concrete examples of what differentiation looks like and a common vocabulary to describe specific practices. "Well-honed strategies for how to respond to each individual's abilities are often hidden behind the closed doors of expert teachers' classrooms," write Carolan and Guinn. "It's time to open these doors and see the dynamic and complex nature of differentiation in practice."

"Differentiation: Lessons from Master Teachers" by Jennifer Carolan and Abigail Guinn in *Educational Leadership*, Feb. 2007 (Vol. 64, #5, p. 44-47), no e-link available

3. A New View of Attention-Deficit Disorder

In this *Educational Leadership* article, Yale Medical School professor Thomas Brown explains a new model for understanding attention deficit disorder – it's now seen as an impairment in the brain's cognitive management system – and issues a plea for early diagnosis so students can get appropriate interventions and avoid "becoming demoralized by repeated experiences with frustration and failure." Brown likens an ADD/ADHD person's brain to a symphony orchestra in which individual instruments (cognitive functions) may be working well but there's a problem with the conductor. "Regardless of their expertise," he writes, "the musicians need a competent conductor who will select the piece to play, make sure they start at the same time and stay on tempo, fade in the strings and then bring in the brass, and manage them as they interpret the music."

Brown describes the six executive functions of the brain:

- *Activation* – organizing, prioritizing and getting started with tasks;
- *Focus* – zeroing in, sustaining attention, avoiding distractions, and shifting focus when necessary;
- *Effort* – being alert and sustaining effort and processing speed;
- *Emotion* – managing frustration and other feelings appropriately;
- *Memory* – using working memory and recalling important information;
- *Action* – monitoring and regulating what we do.

These functions aren't fully developed until our late teens and early twenties and don't work perfectly in *anyone's* brain – all of us have problems with some of them some of the time – but people with ADD/ADHD are significantly more impaired. There are wide variations, though, and Brown says that diagnosing ADD/ADHD is like distinguishing between clinical depression and normal mood swings. A diagnosis of ADD/ADHD is only warranted, he says, "when the individual's impairment is significantly greater than that of most other children of the same age and developmental level." Such a diagnosis might be possible in the early grades, or might not occur until a child encounters the more rigorous demands of high school.

Chronic problems with achievement in school warrant a full diagnostic workup for ADD/ADHD, says Brown. (But he warns that three groups of students with ADD/ADHD tend

to be overlooked: high-achieving students, female students, and students under stress.) A diagnosis may or may not lead to prescribing medications. Meds don't work for everyone, but Brown cites extensive research that 8 of 10 people with ADD/ADHD "experience significant improvement in their functioning when treated with appropriately fine-tuned medications." Meds, he cautions, do not "cure" ADD/ADHD; they must be in the bloodstream (and the brain) to improve executive functions. Nor are medications a cure-all for other learning disabilities that may be operating concurrently, which is true of half of children with ADD/ADHD. Learning disabilities require skilled teacher intervention in the classroom day after day, week after week, month after month.

Brown lists a number of myths about ADD/ADHD. See if you can spot the fallacy in each of these:

- ADD is just a lack of willpower. People with ADD focus perfectly well on things that interest them.
- ADD is a problem of being hyperactive or not listening when someone is talking to you.
- The brains of people with ADD are overactive and need medication to calm down.
- ADD is a label for behavior problems; children with ADD just refuse to sit still and are unwilling to listen to teachers or parents.
- Those who have ADD as children usually outgrow it as they enter their teens.
- Unless you have been diagnosed with ADD as a child, you can't have it as an adult.
- You can't have ADD and also depression, anxiety, or other psychiatric problems.
- If a child has severe stressors in his or her life – divorce, parents losing jobs, poverty, multiple relocations – those are probably the cause of school achievement problems.
- Medications for ADD are likely to cause longer-term problems with substance abuse or other health concerns.
- ADD doesn't really cause much damage to a person's life.

"A New Approach to Attention Deficit Disorder" by Thomas Brown in *Educational Leadership*, Feb. 2007 (Vol. 64, #5, p. 22-27), no e-link available. Resources on ADD/ADHD are available at http://help4ADHD.org and at http://chadd.org.

4. Best Practices Using Data

This *Education Week* article describes a new study of four successful school districts' and charter management organizations' use of data. Among the practices:

• Building a culture that values regular use of data to make instructional, curriculum, resource, and planning decisions;

• Conducting professional development on using data to improve instruction (this was essential to overcome initial skepticism among some teachers);

• Setting clear, grade-by-grade learning expectations;

• Using high-quality instructional materials aligned with those expectations;

• Giving teachers pacing guides describing the breadth and depth of content to be taught;

• Setting specific, measurable student performance goals at the system, school, and classroom level;

• Using interim assessments to track student progress at intervals during each year, including explicit data-analysis protocols and goal-monitoring reports;

• Investing in data-management infrastructure and personnel to get interim assessment data to teachers and administrators in a timely and user-friendly way;

• Giving teachers time to collaborate with colleagues using interim assessment data to refine instruction and follow up with struggling students (also time to collaborate with educators from other schools);

• Giving teachers flexibility to use different instructional strategies depending on what they learn from interim assessments.

"Data-Wise School Systems Seen As Sharing Key Traits" by Lynn Olson in *Education Week*, Feb. 14, 2006 (Vol. 26, #223, p. 5), no free e-link available. The study, entitled "Achieving With Data", was conducted by the Center on Educational Governance at the University of Southern California and was commissioned by the NewSchools Venture Fund. It focused on two districts, Garden Grove, California and Aldine, Texas, and two charter management organizations, Achievement First, based in New Haven, Connecticut, and Aspire, based in Oakland, California.

5. Fighting the Myth of the "Model Minority"

This *Education Week* article reports on the widespread assumption that Asians are more intelligent, especially at math. "Let Matt do it, he's Asian," say classmates of Matt Kishiyama, a Virginia high-school student, when a hard math problem comes up. Steve Kay, another Asian student in this high school, explains why he's enrolled in Algebra I in tenth grade: "I'm not the smart Asian. I guess I got the dumb gene."

The article describes some teachers' assumptions about the genetic or cultural academic superiority of Asian students. "They have the most meticulous homework, they don't skip steps," says Tobias Dienstfrey, a math teacher at this high school, "and they always do the homework." And indeed, the achievement of Asian students in America schools is impressive.

But when you analyze achievement data by subgroups of Asian students, it turns out that the key variables are parental education and economics – there is as much variation among Asian-Americans as there is within other groups. "What this tells us," says Jamie Lew, an urban education professor at Rutgers, "is that even in a relatively homogeneous Asian community like immigrant Koreans, who share a common culture and language, there are big differences in terms of academic achievement. The conversation needs to be much more complex."

"The 'Other' Gap" by Lesli Maxwell in *Education Week*, Feb. 14, 2006 (Vol. 26, #223, p. 26-29), no free e-link available

6. Self-Discipline As a Variable in Girls' Achievement

This *Education Week* article reports on research suggesting that self-discipline may be a key reason that girls are outperforming boys in school. University of Pennsylvania researchers Angela Lee Duckworth and Martin Seligman studied why some students achieved above their IQ potential and others underachieved – and found that self-discipline was a key variable.

Teachers, parents, and students were questioned and almost uniformly said that girls were more self-disciplined (among other things, girls spent twice as much time on homework as boys). "Girls just work harder," said Jacquelynne Eccles, a University of Michigan professor. "Being a good student, broadly defined, is important to them." The researchers also gave a deferred-gratification test to boys and girls – offering them $1.00 now or $2.00 later – and found that girls were more likely to be willing to wait for more money later.

Another variable mentioned in the article is the tendency of boys to be more confident that they know their subject matter – and therefore study less, even when they need to – while girls tend to be less confident in their knowledge and study more. "Girls tend to over-learn, where boys tend to under-learn," said Jo Anne Rodkey, principal of a Florida elementary school. But there is a downside to girls' less cocky attitude: they get more anxious in high-stakes standardized tests, especially if they are timed, and that impairs their performance.

"Gender Gap In GPAs Seen As Linked to Self-Discipline" by Michelle Davis in *Education Week*, Feb. 14, 2006 (Vol. 26, #223, p. 8), no free e-link available

7. Short Items:

a. Whom do you trust? – A Harris poll conducted in 2006 asked "Would you generally trust each of the following types of people to tell the truth or not?" Teachers ranked second, trusted by 83% and distrusted by 15%. Doctors were first with 85%, and the following seven groups brought up the rear: journalists (trusted by 39%), members of Congress (35%), pollsters (34%), trade union leaders (30%), stockbrokers (29%), lawyers (27%), and actors (26%).

Spotted in *Tools for Schools*, February/March 2007 (Vol. 10, #3, p. 7). The full poll results are available at: http://www.harrisinteractive.com/harris_poll/index.asp?PID=688

b. Online fundraising resources – This *Non-Profit News* website has suggestions for raising funds online: http://news.gilbert.org/Top10FR2006. One of the more interesting links gives suggestions on (a) turning strangers into friends, (b) turning friends into donors, and (c) turning donors into fundraisers.

Spotted in *PEN Weekly NewsBlast* Feb. 16, 2007

c. Usable knowledge website – The Harvard Graduate School of Education has just established a website designed to share practical, helpful research findings, papers, articles, and interviews. The site is organized around five topics: Leadership and Policy, Learning and

Development, Decisions Through Data, Community and Family, and Teaching and Curriculum. You can check it out at: http://www.uknow.gse.harvard.edu.

Spotted in *Ed. Magazine*, Winter 2006-07 (Vol. L, #2, p. 12)

d. Student research help online – This website gives students step-by-step help focusing and organizing information for research projects. It's at http://www.answers.com/main/research_center.jsp

"News to Use" in *Middle Ground*, February 2007 (Vol. 10, #3, p. 6-7)

e. Renewable energy website – This website from the National Renewable Energy Lab has information on renewable energy technologies, energy efficiency, alternative fuels, advanced vehicle technologies, and applications of renewable energy. Check out: http://www.nrel.gov/learning.

"News to Use" in *Middle Ground*, February 2007 (Vol. 10, #3, p. 6-7)

f. Middle school science website – This website from the National Academy of Scientists encourages students, especially girls, to pursue an interest in science through science labs, games, and a parent-teacher guide: http://www.iwaswondering.org.

"News to Use" in *Middle Ground*, February 2007 (Vol. 10, #3, p. 6-7)

g. International communication website – The Creative Connections website (sponsored by the New York Foundation of the Arts) allows students to exchange e-mailed questions and answers, artwork, music, and scrapbooks with students in Africa, China, Latin America, the Amazon rain forest, the Galapagos Islands, or the Arctic – in English, Spanish, or Chinese: http://www.ccph.com.

"News to Use" in *Middle Ground*, February 2007 (Vol. 10, #3, p. 6-7)

h. Global awareness resources online – This free website from the Global Learning Project (sponsored by Apple and the EF Foundation) has unit and lesson plans to help teachers infuse global awareness into their classrooms through virtual experiences and technology: http://edcommunity.apple.com/ali

"News to Use" in *Middle Ground*, February 2007 (Vol. 10, #3, p. 6-7)

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 36 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 (with occasional breaks; there are about 50 issues a year).

Subscriptions:

Individual subscriptions are $50 for the school year. Rates decline steeply for multiple readers within the same organization. See the website for these rates and information on paying by check or credit card.

Website:

If you go to http://www.marshallmemo.com you will find detailed information on:

- How to subscribe or renew
- Why the Marshall Memo?
- Publications read
- Article selection criteria
- Topics covered
- Headlines for all issues
- What readers say
- About Kim Marshall (including links to articles)
- A free sample issue

Marshall Memo subscribers have access to the Members' Area of the website, which has:

- The current issue (in PDF or Word format)
- All back issues (also in PDF or Word)
- 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 Educator
American School Board Journal
ASCD, CEC SmartBriefs
Atlantic Monthly
Catalyst Chicago
CommonWealth Magazine
Daily EdNews
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
NASSP Bulletin
New York Times
New Yorker
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
Teachers College Record
TESOL Quarterly
Theory Into Practice
Times Educational Supplement, Magazine