Marshall Memo 232

A Weekly Round-up of Important Ideas and Research in K-12 Education
April 28, 2008

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Quotes of the Week

"School success, as it's currently defined, requires a huge amount of resources that schools don't necessarily provide."

Ruby Payne (see item #5)

"No significant learning occurs without a significant relationship."

James Comer (quoted in #5)

"Assigning the weakest students to the weakest teachers is no way to close the achievement gap."

Kati Haycock and Candace Crawford (see item #3)

"There is a region in some people's brains that responds only to pictures of Jennifer Aniston or to pictures of Halle Berry."

John Medina (see item #1)

"Bona fide recorded memory is a very rare thing on this planet. The reason is that the brain isn't interested in reality; it's interested in survival. So it will change the perception of reality to stay in the survival mode."

John Medina (*ibid*.)

"Stressed people don't do math very well. They don't process language very efficiently, and they have poorer memories, both short- and long-term."

John Medina (*ibid*.)

"Why do many people… believe the uneducated are stupid?"

Daniel Gilbert (see item #2)

1. What Brain Research Says About Learning, Health, Exercise, and Stress

In this *Harvard Business Review* interview, University of Washington and Seattle Pacific University brain expert John Medina shares insights on the workings of the human mind – and punctures some myths about "brain-based" learning and management. Some excerpts:

• *Brain plasticity* – "The brain turns out to be so sensitive to external experiences that you can literally rewire it through exposure to cultural influences," he says. "There is a region in some people's brains that responds only to pictures of Jennifer Aniston or to pictures of Halle Berry. For some people, parts of their brain light up only when they are presented with an image of Bill Clinton. Those experiments have actually been done!... So we have to ask ourselves: What other inputs besides Jennifer Aniston are capable of rewiring your brain?" The brain changes constantly throughout life, says Medina, even during a single conversation. "The brain is like a muscle. The more activity you do, the more experience you have, the larger and more complex the brain becomes… The brain remains quite plastic until we die. We are lifelong learners. That's excellent news indeed."

• *Avoiding brain baloney* – "It's fascinating to have a better understanding of how the brain works," says Medina, "but I have to sound a note of caution, despite the stunning achievements. So far, scientists know amazingly little about how to apply our knowledge to real-world settings. If we understood how the brain knew how to pick up a glass of water and drink it, that would represent a major accomplishment."

• *Stress and health* – "Stress hurts the brain," says Medina, "and that inevitably hurts productivity in the workplace… [F]or hundreds of thousands of years, we've been built to handle stress for only about 30 to 60 seconds. Nowadays, our stresses are measured not in moments with mountain lions, but in hours, days, and sometimes months, as we deal with hectic workplaces, screaming toddlers, bad marriages, money problems. Our bodies aren't built for that. If you have a tiger at your doorstep for years, then all kinds of internal mechanisms break down, from sleep rhythms to specific parts of the immune system."

• *Stress and learning* – Medina says that stress releases "a really nasty set of hormones" called glucocorticoids, which are helpful in life-threatening emergencies but damage the brain if they are pumped out too much. "The webbings between brain cells that hold your most precious memories can become disconnected," he says. "The brain can stop giving birth to new neurons." Stress hormones are particularly damaging to the hippocampus, which is deeply involved in learning. "Stressed people don't do math very well," says Medina. "They don't

process language very efficiently, and they have poorer memories, both short- and long-term… One study even showed that adults with chronically high stress levels performed 50% worse on certain cognitive tests than adults with low stress."

• *The brain is not a video camera* – Medina says that the brain is actually not very good at retaining precise memories of events. "Brain research is pretty clear on this point," he says. "Bona fide recorded memory is a very rare thing on this planet. The reason is that the brain isn't interested in reality; it's interested in survival. So it will change the perception of reality to stay in the survival mode." It's a myth that the brain works like pushing the RECORD button and then pressing PLAYBACK later on. "The fact is that the actual moment of learning – the moment of fixing a memory – is so complex that we have little understanding of what happens in our brains in those first fleeting seconds," says Medina. "Long-term memory is even worse. That's because, much like cement, memory takes a long time to settle into its permanent form. While it's busy hardening, human memory can very easily be modified, as traces of earlier memories leave their imprint on it. All of which is to say that our understanding of reality is approximate at best."

• *Ways to improve memory* – Medina mentions two: Consistently re-exposing ourselves to the information we want to learn – he calls it "elaborative rehearsal" – and reproducing the environment in which we first were exposed to something we want to remember. "If, say, you learn something while you are sad," he explains, "you will be able to recall it better if at retrieval you are somehow made suddenly sad."

• *The brain and exercise* – "There's no end of research that connects exercise – especially aerobic exercise – with brain health," says Medina. Exercise keeps the blood vessels in the brain healthy, which is why people who exercise are 50% less likely to contract Alzheimer's disease – the non-genetic type, that is, which accounts for half of the incidence of this disease.

• *IQ and personality tests* – Medina admits to "a certain grumpiness" when it comes to intelligence and psychological tests, including the Myers-Briggs. "The fact is that most of these tests – including IQ tests – were developed long before we knew very much about how the brain processes anything," he says – but expresses optimism that such tests will benefit from dramatic advances in brain research in the years ahead.

"The Science of Thinking Smarter: A Conversation with Brain Expert John J. Medina" by Diane Coutu in *Harvard Business Review*, May 2008 (Vol. 86, #5, p. 51-54), no e-link

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2. An Expert Comments on Resilience and Happiness

In this *New York Times* interview, Harvard social psychologist Daniel Gilbert says that early in his career, he was fascinated with people's tendency to "ignore the power of external situations to determine human behavior… Why do many people, for instance, believe the uneducated are stupid?" he wondered.

But then Gilbert had a series of negative experiences in his own life and was struck by his ability – and the ability of others he spoke with – to deal with adverse events. "The truth is," he says, "bad things don't affect us as profoundly as we expect them to. That's true of good things too. We adapt very quickly to either." Gilbert began to do research on happiness, and eventually wrote a best-selling book, *Stumbling on Happiness* (2007).

On a happiness scale from zero to 100, Gilbert found that people generally report they are moderately happy – around 75. "We keep trying to get to 100," he says. "Sometimes we get there. But we don't stay long. We certainly fear the things that would get us down to 20 or 10 – the death of a loved one, the end of a relationship, a serious challenge to our health. But when those things happen, most of us will return to our emotional baselines more quickly than we'd predict. Humans are wildly resilient."

One resilience mechanism, says Gilbert, is the ability to rationalize negative events. When a relationship ends, we might say, *He or she was never right for me*, or when we lose a job, *I actually need more free time for my family*. There are indications that clinically depressed people aren't as good at reframing events in this way.

What is the key to being happy? Gilbert says that "the best predictor of human happiness is human relationships and the amount of time that people spend with family and friends. We know that it's significantly more important than money and somewhat more important than health… Another thing we know from studies is that people tend to take more pleasure in experiences than in things… One reason for this is that experiences tend to be shared with other people and objects usually aren't."

"You couldn't pay me $100,000 to miss a play date with my granddaughters," he concludes. "And that's not because I'm rich. That's because I know that a hundred grand won't make me as happy as nurturing my relationship with my granddaughters will."

"A Conversation with Daniel Gilbert" by Claudia Dreifus in *The New York Times*, Apr. 22, 2008 (p. D2)
http://www.nytimes.com/2008/04/22/science/22conv.html?_r=1&scp=2&sq=Claudia+Dreifus+&st=nyt&oref=slogin

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3. Getting the Best Teachers to the Students Who Need Them the Most

(Originally titled "Closing the Teacher Quality Gap")

In this *Educational Leadership* article, Kati Haycock and Candace Crawford of the Education Trust bemoan the fact that lower-SES children have a much higher proportion of unlicensed, out-of-field, and inexperienced teachers than their more advantaged peers. Despite the fact that some novices are more effective than teachers with years of experience, that is not generally the case. Most poor children get the short end of the stick, and the impact on their learning is cumulative as they move through the grades. "Assigning the weakest students to the weakest teachers is no way to close the achievement gap," say Haycock and Crawford.

Citing programs in Chattanooga, New York City, Boston, Chicago, and Colorado, the authors outline the steps necessary to get high-quality teachers to high-need schools:

• *Start with the data*. Gather statistics on teacher turnover, out-of-field instructors, and years of experience and compare what lower- and higher-SES students in your district experience.

• *Confront the brutal facts*. "Gaps in teacher quality are a big contributor to gaps in student achievement," say Haycock and Crawford. "Ask the question, If we don't change these patterns, can we honestly claim we are doing everything we can to close long-standing achievement gaps?"

• *Find out what it would take*. "Ask some of the strongest teachers in the district what it would take to get them to teach in one of the most challenging schools," suggest the authors. You'll come up with a number of possible interventions: incentive pay, smaller classes, strong principals, compatible colleagues – or fixing the bathrooms.

• *Address within-school differences*. Sometimes the biggest differences in teacher quality are within schools, not between them, say Haycock and Crawford. For example, ninth graders, by far the neediest high-schoolers, often have the least-experienced and least-qualified teachers because other teachers vie for less-challenging assignments. Principals can use a variety of approaches to staff the less "desirable" classrooms with those best equipped to make a difference: pitching a direct, moral appeal to the most effective teachers; giving them an extra prep period; or requiring teachers with advanced classes to also teach a low-performing 9th-grade class.

• *Use several approaches simultaneously*. It will take multiple strategies to solve this problem, say the authors, including: Effective principals; salary incentives for strong teachers to stay in or move to high-need schools; subsidized masters' programs and professional development; significantly smaller class size; and programs to develop teachers within the district.

• *Learn from data on teacher effectiveness*. "Value-added" estimates of teacher and school impact will provide invaluable feedback on what's working and what isn't.

"Closing the Teacher Quality Gap" by Kati Haycock and Candace Crawford in *Educational Leadership*, April 2008 (Vol. 65, #7, p. 14-19). This article is available free at http://www.ascd.org/infocon. The authors can be reached at khaycock@edtrust.org and ccrawford@edtrust.org.

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4. Giving the Children of Poverty a Fair Shake

(Originally titled "The Myth of the 'Culture of Poverty'")

In this passionate *Educational Leadership* article, Hamline University professor Paul Gorski attacks the conventional wisdom that poor people share a consistent, monolithic, and predictable set of beliefs and behaviors. He cites research from around the world that "*There is no such thing as a culture of poverty*. Differences in values and behaviors among poor people are just as great as those between poor and wealthy people." Gorski goes on to skewer four myths about poverty:

• *Myth #1: Poor people are lazy*. In fact, says Gorski, poor working adults spend more hours working each week than their wealthier counterparts, and 83 percent of poor children have at least one employed parent.

• *Myth #2: Poor parents don't care about education*. Gorski cites research showing that poor parents have the same beliefs about education as the affluent, but attend fewer school functions because of jobs that don't give paid leave, child care responsibilities, and lack of transportation. "It might be said more accurately that schools that fail to take these considerations into account do not value the involvement of poor families as much as they value the involvement of other families," says Gorski.

• *Myth #3: Poor people are linguistically deficient*. In fact, he says, the languages and dialects used by the poor are highly structured and have complex grammatical rules. They just aren't the language of power.

• *Myth #4: Poor people abuse drugs and alcohol*. In fact, says Gorski, "Poor people are no more likely than their wealthier counterparts to abuse alcohol or drugs. Although drug sales are more visible in poor neighborhoods, drug use is equally distributed across poor, middle class, and wealthy communities." In fact, alcohol consumption is significantly higher among upper-middle-class white high-school students than among poor black high-school students, and there is evidence that the wealthy are more likely to be substance abusers than the poor.

These four stereotypes about the poor lead even well-intentioned educators to lower their expectations and embrace a deficit theory, which defines poor children by their weaknesses and blames poverty on moral and intellectual deficiencies rather than social conditions. While there is much work to be done at the national and state level to improve health care and provide living-wage jobs, affordable housing, and safer communities, Gorski calls on educators to stop trying "fix" poor students and get to work abolishing practices that work against high achievement for all students. Specifically, he suggests that we:

- Educate ourselves about class and poverty and unlearn the myths about poverty.
- Reject deficit theory and help students and colleagues get rid of misperceptions about poverty.
- Speak up when colleagues stereotype poor students or parents.
- Invite colleagues to observe our teaching and look for any signs of class bias.
- Continue reaching out to low-income families even when they appear unresponsive.
- Take steps to make it possible for all families to be involved in the school.
- Never assume that all students have access to computers and the Internet, and never give assignments that require access without providing in-school time to complete them.
- Make curriculum relevant to poor students, validating their experiences and intelligences; teach about issues relating to class and poverty, including consumer culture, labor unions, and environmental injustice; teach about the antipoverty work of Martin Luther King, Jr., Helen Keller, and others.
- Ensure that learning materials don't stereotype poor people.

- Fight to keep low-income students from being assigned unjustly to special education or low academic tracks.
- Work to get healthy options on cafeteria menus.

"The Myth of the 'Culture of Poverty'" by Paul Gorski in *Educational Leadership*, April 2008 (Vol. 65, #7, p. 32-36). This article is available free at http://www.ascd.org/infocon. Gorski can be reached at gorski@edchange.org.

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5. Ruby Payne on Boosting Disadvantaged Students' Achievement

(Originally titled "Nine Powerful Practices")

In this *Educational Leadership* article, lecturer Ruby Payne outlines nine strategies to raise the achievement of disadvantaged children:

• *Build relationships of respect*. Payne agrees with James Comer: "No significant learning occurs without a significant relationship" (1995). But this doesn't mean becoming the student's buddy, she says. "It means that teachers both insist on high-quality work and offer support." According to one study, high-school students said that a respectful teacher:

- Calls me by my name.
- Answers my questions.
- Talks to me respectfully.
- Doesn't "diss" me.
- Notices me and says "Hi."
- Helps me when I need help.

• *Create a collaborative culture*. When students are learning something new, says Payne, it's especially important that it happen in a supportive context.

• *Teach students to speak in formal register*. Payne says research has found that all the world's languages have five "registers":

- Frozen – The words remain the same (the Pledge of Allegiance);
- Formal – The word choices and sentence structure used in schools and businesses ("This assignment is not acceptable in its present format");
- Consultative – A mix of formal and casual ("I can't accept the assignment the way it is");
- Casual – The language used among friends, with few abstract words ("This work is a no-go. Can't take it");
- Intimate – Private language, e.g., between twins or lovers.

School and work settings operate at the consultative level, and most school tests are written in formal English, which puts poor students at a disadvantage since they hear little formal English, except in church. Payne suggests that teachers give students practice translating from casual to formal register. When African-American students say that formal English is "white talk," Payne tells them it's "money talk."

• *Assess each student's resources*. "School success, as it's currently defined, requires a huge amount of resources that schools don't necessarily provide," says Payne. She suggests assessing each student in these areas:

- Financial;
- Emotional – self-control, especially under stress;
- Mental – acquired reading, writing, and computing skills;
- Spiritual – belief in a divine purpose and guidance;
- Physical health;
- Support systems – family, friends, and support available in times of need;
- Relationships and positive adult role models;
- Knowledge of unspoken rules (see below).

"Teachers need to be aware that many students identified as 'at risk' lack these outside resources," says Payne. "Interventions that require students to draw on resources they do not possess will not work."

• *Teach the hidden rules of school*. Actions and attitudes that help a child survive in a poor community are sometimes counterproductive in school. Without denigrating survival skills, schools need to teach students how to behave in school.

• *Monitor academic progress and plan interventions*. Payne suggests a schoolwide process of using interim assessments and rubrics to measure progress, zeroing in on areas where students need help, and choosing instructional strategies that have the biggest payoff.

• *Translate the concrete into the abstract*. The best way to help students make this important leap is to give them mental models – stories, analogies, or visual representations.

• *Teach students how to ask questions*. "Questions are a principal tool to gain access to information," says Payne, "and knowing how to ask questions yields a huge payoff in achievement."

• *Forge relationships with parents*. "It is essential to create a welcoming atmosphere at school for parents," says Payne. This includes greeting them with a smile, emphasizing that the school cares about their child, avoiding educational jargon, helping parents not feel ganged up on in meetings, and refraining from asking parents to do things they lack the resources to do.

"Nine Powerful Practices" by Ruby Payne in *Educational Leadership*, April 2008 (Vol. 65, #7, p. 48-52). This article is available for free at http://www.ascd.org/infocon. The author can be reached at RubyPayne@msn.com.

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6. The Potential of Full-Service Schools – and Lessons Learned

(Originally titled "Centers of Hope")

"[S]chools alone cannot fix a society that allows poor children to fail," writes full-service schools advocate Joy Dryfoos in *Educational Leadership*. "To address the achievement gap in a meaningful way, we need to reach beyond the traditional school boundaries, involving the community in combating the effects of poverty on children and their families." She describes the ideal community school: it's open afternoons, evenings, weekends, and over the

summer; it provides after-school activities, adult education, and educational enrichment; and it welcomes families and community members for services and activities provided by community agencies, including medical, dental, mental health, and social-service.

"Community schools offer hope," says Dryfoos. "They bring together in one place an array of helping hands. They integrate social and health supports with educational enrichment. They teach low-income parents how to help their children do better in school and connect families to the resources they need, such as welfare, help with income taxes and citizenship processes, and even assistance in creating small businesses. In this process, the school becomes the hub, improving the safety and stability of the neighborhood."

There are between 3,000 and 5,000 full-service schools in the U.S., and Chicago has one of the most ambitious programs, aiming to make every one of its 600-plus schools a full-service facility. Several lessons can be drawn from the experience so far, says Dryfoos. It's important to have the mayor and school superintendent behind the effort, garnering funds and coordinating services from different agencies and universities. Each school's principal is crucial to success, working with various agencies and an on-site coordinator to integrate services into the school's overall mission and prevent programs from becoming silos.

Dryfoos concludes with an important caveat: "Although research has documented various benefits of community schools," she writes, "it has also found that student test scores are slow to improve. First, the school has to be transformed into an effective learning community, which requires at least several years of hard work on the part of teachers, administrators, service partners, and the broader community. The transformation process is labor intensive; it requires open communication, endless meetings, and a lot of patience. And even with all the extra supports provided by community schools, experience has shown that the quality of instructional leadership and professional development is still the key determinant of student academic achievement."

"Centers of Hope" by Joy Dryfoos in *Educational Leadership*, April 2008 (Vol. 65, #7, p. 38-43). This article can be purchased for $3.00 at http://www.ascd.org/infocon. The author can be reached at jdryfoos@verizon.net.

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7. School Refusal Behavior and What Schools Can Do

In this helpful *Principal Leadership* article, Wisconsin school psychologist Mary Wimmer explains school refusal behavior, a term that encompasses school phobia, truancy, and students acting out, complaining about school, and missing days, weeks, or months of instruction. These are some of the warning signs:

- Frequent unexcused absences;
- Frequent tardiness;
- Absences on specific days (e.g., when tests, speeches, on physical education occur);
- Frequent requests to go to the nurse's office;
- Frequent requests to call home or to go home during the day.

How big a problem is school refusal? When tardiness, missed classes, and other unexcused absences are included, about 28 percent of students are involved in some kind of school refusal behavior. Here are the major causes:

• *Anxiety disorders* - Roughly 2 - 5 percent of students refuse to attend school for emotional reasons. Anxiety disorders include: (a) Separation anxiety – fear that harm will befall a loved one and being overly dependent on parents and other caregivers; (b) Social and performance anxiety – these students worry about what others think of them, fear humiliation, and are worried about how they will be judged (in tests, speeches, and sports); (c) Generalized anxiety disorder – these students are excessively unsure of themselves, anxious and worried about their competence, and perfectionistic about their school work; they may also worry about outside events like war and natural disasters, and anxiety interferes with their concentration and can cause fatigue, restlessness, irritability, sleep disturbances, and muscle tension.

• *Depression* – Symptoms among adolescents include: depressed mood, lack of interest in activities, irritability, difficulty getting along with others, rebellious or risk-taking behavior, sleep difficulties, physical complaints, fatigue or lethargy, feelings of inadequacy or excessive guilt, difficulty concentrating or indecisiveness, and thoughts of death or suicidal ideation.

• *Physical complaints* – School refusers often complain of stomachaches or headaches without a medical condition. Sometimes an actual physical ailment like asthma can cause legitimate absences, then cause secondary problems when the student is anxious about returning to school. Schools should consult students' physicians to learn their medical condition (with parent permission, of course).

• *School factors and community influences* – These can include fear of tests, students feeling unsafe on the way to school or in school because of bullying or gang activity, a high level of disorder in the school, low staff morale, a high level of student and/or teacher absenteeism, an authoritarian style of school management, and too much emphasis on competition.

• *Family factors* – Some school refusers are influenced by family members with mental health or lifestyle problems – anxiety, dependency, depression, substance abuse, high levels of conflict, or emotional detachment. Younger students with separation anxiety may also refuse to go to school to gain attention. In these cases, it's important to intervene with the whole family.

• *Other variables* – School refusal can be triggered by events such as a death in the family and by milestones, especially transitions from one school to another. The most common age for school refusal is early adolescence. Some students get into a pattern of refusal when they perceive school work as too difficult and see school as a place where they fail. And some students refuse school to pursue a desired activity, such as television and video games or hanging out with friends. These school refusers are usually called truants!

What can schools do about school refusal? Early diagnosis and intervention are crucial, says Wimmer: "A good policy is to act quickly and acknowledge that many factors contribute to school refusal behavior." A team problem-solving approach is best to get to the root of the problem and design an appropriate course of action. The team might include teachers, administrators, school mental health professionals, the school nurse, the student's parents, the

physician, other relevant community providers, and the student. Interventions might include counseling and therapy, forced attendance or gradual reentry, or a referral for truancy. Wimmer suggests these additional actions:

- Educate teachers on the early warning signs of school refusal.
- Set up rewards for school attendance.
- Work with parents to monitor attendance.
- Facilitate access to mental health services.
- Address school safety issues through anti-bullying and anti-violence initiatives.
- Provide academic supports for students who refuse school for academic reasons.
- Create a welcoming, engaging environment that helps students feel connected to their school and teachers.
- Provide a safe place where students can go when feeling stressed or overwhelmed.
- Allow for progressive re-entry over one or two weeks.
- Temporarily allow a flexible school day.
- Show sensitivity to students who have performance anxiety, for example, reduce the need for the student to give speeches or provide an alternate test-taking environment.
- Involve families in the school through outreach and after-school programs.
- Collaborate with medical or community-based team members.
- When other alternatives have been unsuccessful, consider part-time schooling for students with extended absences (i.e., over two years) that result from extreme levels of anxiety and depression.

"School Refusal" by Mary Wimmer in *Principal Leadership*, April 2008 (Vol. 8, #8, p. 10-14), no e-link available

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8. Putting Books in Students' Hands Over the Summer

(Originally titled "Got Books?")

In this *Educational Leadership* article, University of Tennessee/Knoxville professors Richard Allington and Anne McGill-Franzen report on research showing that the gains that low-SES students make during the school year are often undercut over the summer – and this loss is "the primary source of the reading achievement gap." One study found that 80 percent of the gap between poor and non-poor 14-year-olds could be attributed to summer backsliding. This is heartbreaking for teachers who work heroically during the year, only to see their students' gains evaporate in July and August.

The reason for summer loss is simple, say the authors: "To become skilled at almost any activity requires extensive and continual practice, whether the skills are physical or cognitive in nature. Just as an athlete's performance diminishes during the off-season if he or she practices less, students' reading performance falls off during the summer months if they don't read."

The problem is that poor children have much less access to books in their homes and communities. One study found that children in higher-income neighborhoods had roughly 10 times greater access to reading material over the summer than lower-income children in the same metropolitan area. This is a problem that can be solved, say Allington and McGill-Franzen, and describe two studies that provided low-income students with summer books they had chosen themselves and asked them to keep a book log on what they read. The programs had small but positive effects on achievement; interestingly, the effects were bigger than either summer school or comprehensive school reform programs – and considerably less expensive.

Allington and McGill-Franzen make the following suggestions for overcoming the chronic problem of summer reading loss:

• Fund summer book programs like the ones they described, perhaps through an extra book fair close to the end of the school year in which students can choose the books they will read over the summer.

• Make sure students have access to books about popular-culture, including movies and video games.

• Capitalize on local knowledge, for example, books about alligators and swamps in Florida.

• If possible, give children access to school libraries over the summer.

"Got Books?" by Richard Allington and Anne McGill-Franzen in *Educational Leadership*, April 2008 (Vol. 65, #7, p. 20-23). This article is available for $3.00 at http://www.ascd.org/infocon. The authors can be reached rallingt@utk.edu and amcgillf@utk.edu.

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9. Are Real-World Math Examples Helping Kids Learn?

This *New York Times* article reports on an Ohio State University study saying that math instruction that incorporates real-world examples may actually confuse students. "The motivation behind this research was to examine a very widespread belief about the teaching of mathematics, namely that teaching students multiple concrete examples, will benefit learning," said Jennifer Kaminski, one of the researchers. "It was really just that, a belief." In a randomized, controlled study published in the journal *Science*, she and her colleagues taught college students a concept three different ways and measured their ability to apply it to a novel situation. Here are the results:

- Students taught through abstract mathematical symbols did best.
- Students taught using real-world examples (measuring cups or tennis balls) and then abstract symbols did second-best.
- Students taught through the real-world examples did worst – little better than if they were simply guessing.

The problem with the real-world examples was that they obscured the underlying math, said Kaminski, making it difficult for students to transfer their understanding to a new situation.

"They tend to remember the superficial…," she said. "It's really a problem of our attention getting pulled to superficial information."

Kaminski and her colleagues believe the same is true of K-12 mathematics – a statement that flies in the face of a pervasive assumption that concrete examples help children get a better understanding of math. She says that even primary-grade experiences with blocks and other manipulatives haven't been proven to be more effective than a more abstract approach to counting and understanding numbers.

"Study Suggests Math Teachers Scrap Balls and Slices" by Kenneth Chang in *The New York Times*, Apr. 25, 2008
http://www.nytimes.com/2008/04/25/science/25math.html?scp=2&sq=Kenneth+Chang&st=nyt

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10. Short Item:

College Summit video – This PBS video reports on a college preparation program for low-income students: http://www.pbs.org/now/shows/417/index.html. For more information on College Summit, go to http://www.collegesummit.org/.

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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

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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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Those read this week are underlined.

American Educator
American School Board Journal
ASCD, CEC SmartBriefs, Daily EdNews
Atlantic Monthly
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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 (online)
Teachers College Record
TESOL Quarterly
The Reading Teacher
Theory Into Practice
Tools for Schools