Marshall Memo 572

A Weekly Round-up of Important Ideas and Research in K-12 Education
February 2, 2015

In This Issue:

Quotes of the Week

"Teachers are well aware that education is at least partly a matter of informing students that some of what they think they know just isn't so."

Annette Taylor and Patricia Kowalski (see item #1)

"Given the fact that word mastery in adulthood is correlated with early acquisition of words, a potentially powerful leveler of family wealth and class may be as simple as engaging in picture-book reading with babies."

Dom Massaro (see item #5)

"I came into high school 3½ years ago wanting to read and write, because I love to read and write. But, as I soon found out, the things I love about books are rarely taught, and the things I love about writing are actively penalized."

Massachusetts high-school senior David Brown (see item #7)

"That is the crux of lesson planning right there, endings and beginnings. If we fail to engage students at the start, we may never get them back. If we don't know the end result, we risk moving haphazardly from one activity to the next. Every moment in a lesson plan should tell."

English teacher Brian Sztabnik (see item #3)

"If you want to create a safe space for students to take risks, you won't get there with a pry bar."

Brian Sztabnik (*ibid*.)

"We can't go back to the bad old days when we thought our schools were great, but the reality was that they were only great for some children. But we must go back to the days when school meant more than testing."

Robert Pondiscio in "Stump Speech Challenge: A New Deal on Testing" in *The Education Gadfly*, January 28, 2015 (Vol. 15, #4), http://bit.ly/1HMmuga

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1. How to Deal with Students' Naïve, Inaccurate Prior Knowledge

"Teachers are well aware that education is at least partly a matter of informing students that some of what they think they know just isn't so," say Annette Taylor and Patricia Kowalski (University of San Diego) in this chapter in *Infusing Psychological Science into the Curriculum*. "From the belief that Columbus fought against those who claimed the earth was flat to students' certainty that increasing self-esteem causes better school performance, inaccurate prior knowledge exists in every domain. Not only are these beliefs pervasive, they can be particularly (and frustratingly) resistant to instruction… Over time, students are apt to revert to their prior misconceptions, if they ever truly gave them up." Studies at the college level have found students initially have only a 41 percent level of accuracy on a test of basic facts in biology and 30 percent in psychology – and there is as little as 5 percent improvement after instruction.

"Clearly just 'telling' students the authoritative view doesn't work to change their misconceptions," say Taylor and Kowalski. "Even if students pay attention to the new information they may just add the new claim on top of the old, or they may retain both pieces of information independently." For example, when young children who believe the earth is flat are told it's actually round (without a good explanation), they sometimes form an image of a pancake-shaped earth (it's still flat) or of two earths, one that people live on and another that looks like a two-dimensional upright circle.

How do misconceptions form and why are they so tenacious? All new knowledge builds on and attempts to integrate with existing knowledge. Sometimes this is straightforward, as when an adult learns how to use a smartphone after using a previous-generation cell phone. But if new knowledge contradicts prior knowledge, integration is more difficult than if one has no knowledge at all. "If teachers are unaware of how students are using their prior knowledge," say Taylor and Kowalski, "then students may incorporate new information into a faulty knowledge base and create additional inaccurate information." For example, students learning about plant growth may assume (based on their understanding of how animals grow) that plants use soil for food and breathe CO^2. Another example from physics: students may have difficulty understanding that when an object is pushed, it stops moving because of the unseen dissipating force of friction, not because it's no longer being pushed. Misconceptions that are based on this kind of categorical misclassification are particularly difficult to dislodge.

Students' misconceptions in psychology, the behavioral sciences, and history are more commonly based on folk wisdom, social interactions, nonscientific sources, flawed instruction,

and media misinterpretation. "With the array of uninformed sources, it's no wonder that students enter psychology class with a great amount of inaccurate information," say the authors. "Often such misconceptions are strengthened by their connection with other misconceptions. For example, the claim that one cannot simultaneously believe in God and in evolution is connected with the misconception that the major religions reject evolution. The intertwining of beliefs results in students becoming deeply committed to their misconceptions and resistant to change."

What are the best strategies for changing deeply rooted misconceptions? First, say Taylor and Kowalski, teachers need to understand the roots of incorrect beliefs and use hands-on approaches to reveal them, discuss them, and suggest alternatives. Then, "students need to experience dissatisfaction with their prior conceptions. To accept an alternative conception, however, the learner must comprehend the new concept, see it as plausible, and believe the new concept will be more useful than the prior conception." For example, to let go of the misconception that "opposites attract" in love relationships, students need to understand how successful matches are mostly driven by similarities. It helps if students externalize their beliefs, visualize the links between concepts, and evaluate the differences.

Another approach is using refutational pedagogies – readings and presentations "that call students' attention to their misconceptions and present scientific evidence in a way that is designed to lower the status of the old view while raising the status of the new view." For example, addressing the myth that humans use only 10% of our brains, the teacher draws students' attention to that claim, discusses its origin and how it attained urban legend status, and then shows how the claim is untrue using evidence of much more widespread brain activity. The refutational approach doesn't always work – sometimes people tune out as soon as they realize their previous beliefs are being questioned.

Of course students' individual characteristics are an important variable – how open they are to change, how skilled they are at critical thinking, basic cognitive ability, whether they view knowledge as fixed or malleable, and whether they're willing to commit the effort to change established beliefs.

The bottom line, say Taylor and Kowalski: Misconceptions don't change unless they are "directly, repeatedly, and actively addressed."

"Student Misconceptions: Where Do They Come From and What Can We Do?" by Annette Taylor and Patricia Kowalski in *Applying Science of Learning in Education: Infusing Psychological Science into the Curriculum*, Society for the Teaching of Psychology, 2014 (p. 259-273), http://teachpsych.org/ebooks/asle2014/index.php; Taylor can be reached at taylor@sandiego.edu.

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2. Can Likeness Beget Liking Between Teachers and Students?

In this Panorama Education working paper (under review by *The Journal of Educational Psychology*), Hunter Gehlbach, Maureen Brinkworth, Aaron King, and Joe McIntyre (Harvard Graduate School of Education), Laura Hsu (Merrimack College), and Todd

Rogers (Harvard Kennedy School) report on their study identifying commonalities between high-school students and their teachers to see if this would improve teacher-student relationships and student achievement.

The researchers had 315 ninth graders and 25 of their teachers in a suburban high school in the Southwest fill out a detailed get-to-know-you computerized survey at the beginning of the school year. Some sample questions:

- The most important quality in a friend is: (a) Being there when you need him/her; (b) Listens to you and understands you; (c) Always has your back.
- If you could have one thing in common with your teacher, which of the following would it be? (a) Sense of humor; (b) Interest in the same subject matter; (c) Mutual respect; (d) Similar personality.
- If you could go to one sporting event, which of the following would you go to: (a) World Cup Soccer; (b) Olympics (c) NBA Championship; (d) Super Bowl; (e) World Series.

The researchers then identified a number of teachers and students who shared five common interests, passed that information along to those pairings, and asked what was most surprising (this was designed to get everyone thinking more carefully about areas of common ground). Later in the school year, the researchers asked about perceptions of teacher-student relationships and looked for changes in students' grades.

What were the results? Improvements in teacher-student relationships and student grades were small but significant. When Gehlbach et al. separated out the data on African-American and Hispanic students from white and Asian students, the differences were more robust: teacher-student relationships improved much more between teachers and black and Hispanic students who were told about commonalities, and those students' academic achievement improved by .4 of a letter grade on a four-point scale – the difference between a C+/B- and a B. "These effects on grades are substantial," say Gehlbach et al., noting that the overall achievement gap between well-served and underserved students in the school was about .6 of a letter grade. "When teachers learned about the similarities that they shared with their underserved students, the achievement gap was reduced by two-thirds to only .2 of a letter grade."

What explains this effect? The researchers point to a body of social-psychological research on how perceiving similarities with others fosters liking and more-positive relationships. By providing teachers and students with information on common interests, the researchers catalyzed improvements in relationships. "Many teachers may see it as part of their role to connect with students and form a positive working relationship," say Gehlbach et al. "Knowing what they have in common with their students provides them with a lever through which they can begin developing this relationship. For a group of predominantly white teachers, learning what they have in common with their underserved students may be critically important."

The positive impact of knowing common interests is especially important for teachers who may have had stereotyped views of students and realized important areas of common

ground – ways that students were almost part of their in-group. And this translated into a remarkably strong impact on students' classroom performance.

"Creating Birds of Similar Feathers: Leveraging Similarity to Improve Teacher-Student Relationships and Academic Achievement" by Hunter Gehlbach, Maureen Brinkworth, Aaron King, Joe McIntyre, Laura Hsu, and Todd Rogers, under review by *The Journal of Educational Psychology*, available at www.panoramaed.com/research/similarity; Gehlbach can be reached at hgehlbach@panoramaed.com.

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3. Beginning and Ending Lessons Effectively

In this *Edutopia* article, English teacher Brian Sztabnik says that lesson planning should follow the time-honored maxims of good writing: start with the end in mind, plan effective beginnings and endings, and grab students' attention. "That is the crux of lesson planning right there," he says, "endings and beginnings. If we fail to engage students at the start, we may never get them back. If we don't know the end result, we risk moving haphazardly from one activity to the next. Every moment in a lesson plan should tell." Sztabnik suggests four key elements for lesson launches and four for wrapping up (the full article has numerous links):

Lesson beginnings:

• *Use video clips*. Well-chosen YouTube nuggets are a great way to create an anticipatory set. For example, Sztabnik asked students to draw comparisons between Carl Sandburg's poem "Chicago" and the Chrysler Super Bowl commercial featuring Eminem.

• *Start with good news*. "If you want to create a safe space for students to take risks, you won't get there with a pry bar," says Sztabnik. One alternative is spending the first two minutes of class having students share positive thoughts.

• *Forge links to other subject areas*. "Integrating other disciplines teaches students that ideas and concepts do not stand alone but rather exist within a wider web of knowledge," he says. For example, have math students measure the angles of a Picasso painting, play a song that makes a classical allusion in a unit on mythology, or toss a football around the class before teaching the physics of a quarterback's spiral.

• *Write for five*. Students need to write a lot if they are to improve and build stamina – five times more than the teacher can grade, says Sztabnik. One idea is to have students spend the first five minutes of class writing in response to an essential question.

Lesson endings:

• *Level up*. Emulate this compelling feature of video games by having students chart their own progress toward mastery of standards, perhaps challenging them to move from Beginner to Heroic to Legendary to Mythic.

• *Use exit tickets*. These can provide on-the-spot assessment information, ask students to analyze their own performance, give the teacher feedback on the lesson, and provide a channel for communication. "However they are used," says Sztabnik, "they provide quick and comprehensive bits of data and feedback."

• *Harness social media*. Twitter, Pinterest, and Instagram can be used in positive ways in the classroom, especially for wrapping up lessons – for example, challenging students to compose a tweet or find an image that best captures what they just learned.

• *Make peer learning visible*. Sztabnik suggests that a few minutes before the closing bell, students should write one thing they learned from someone else in the class on a sticky note and put it on the board – then start the next lesson by reading the notes aloud.

"The 8 Minutes That Matter Most" by Brian Sztabnik in *Edutopia*, January 5, 2015, http://bit.ly/1BUClDq

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4. How Technology Can Widen the Achievement Gap

In this *New York Times* Op-Ed article, psychologist/author Susan Pinker shares some troubling data about giving computers and Internet access to young children. After the initial novelty wears off:

- Students in grades 5-8 with access to a home computer generally have lower reading and math scores.
- For younger children, freedom to surf the Internet is linked to lower school grades.
- For many boys and African Americans, reading scores decline precipitously after their computers arrive.

"We don't know why this is," says Pinker, "but we can speculate. With no adults to supervise them, many kids used their networked devices not for schoolwork, but to play games, troll social media, and download entertainment." The result: less personal contact with peers, less discourse with adults, and less cuddling with family members, all of which hold back vocabulary and conceptual development.

Can technology ever be helpful? Probably under the following conditions, says Pinker: (a) If it's well-suited to the task – for example, teaching about science simulations; (b) if it helps accommodate students with disabilities; (c) if it's used as a tool by an effective, well-trained teacher. Even here, research remains inconclusive, Pinker says: "While we're waiting to find out, the public money spent on wiring up classrooms should be matched by training and mentorship programs for teachers, so that a free and open Internet, reached through constantly evolving, beautifully packaged and compelling electronic tools, helps – not hampers – the progress of children who need help the most."

"Can Students Have Too Much Tech?" by Susan Pinker in *The New York Times*, January 30, 2015, http://nyti.ms/1zvdW6D

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5. Three Letters to *The New Yorker* on Parent-Child Conversations

The New Yorker printed three responses to Margaret Talbot's January 2015 article on the importance of adult conversation with babies and toddlers ("The Talking Cure" summarized in Marshall Memo 569). Dom Massaro of Santa Cruz, California wrote that good

picture books are an excellent way to elevate the level of vocabulary young children hear. According to a recent replication study by psychologists at Stanford University, the variety of words in picture books is richer and more varied than parents and caregivers talking to their children. "Even the language quality of two adults talking to each other fell below that of picture books," says Massaro. "Given the fact that word mastery in adulthood is correlated with early acquisition of words, a potentially powerful leveller of family wealth and class may be as simple as engaging in picture-book reading with babies."

Bonnie Sitman of Shepherdstown, West Virginia describes a parent coaching program being implemented in her state. "We focus on conversation, exposure to the sounds and rhythms of language, and 'translating' the child's communicative attempts into words and phrases," she says. "It is imperative to help parents understand the importance of engaging with their child and to teach them to follow their child's lead in play. When parents feel too overwhelmed to sit down and play with their child, we help them discover ways to include learning in everyday tasks, such as bathing and meal preparation."

Dr. Christine Casas of the American Academy of Pediatrics in Houston wrote that we need to address the "toxic stress" that many low-income children live with almost every day. "Talking to children is great," says Casas, "but physicians, child advocates, legislators, and parents would do well to think about how the United States can enact policies that will improve the lives of poor children and their adult caregivers. This would mean insuring better access to affordable preventive health care, including mental health care; subsidizing child care and housing; and nutritious food."

"The Mail: Baby Talk" in *The New Yorker*, February 2, 2015, no e-link available

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6. I'm Like, Why Are People Talking This Way?

In this *Boston Globe* article, Britt Peterson explains how two recent linguistic innovations have infiltrated many people's everyday speech and social-media communication:

• The "quotative like" introduces a quote, thought, or feeling, as in First Lady Michelle Obama's recent comment on *The Tonight Show* about the problems of going out for dinner with her husband: "He's like, 'I'm going to take you, and we're going to go out on a romantic dinner.' And I'm like, 'Is the ambulance coming?'" Linguists first noticed this use of 'like' in the early 1980s in California, and in the next decade it took the world by storm and is now used from Jamaica to New Zealand.

• The African-American English (AAE) variation, "be like," uses the aspectual or habitual tense (which is not conjugated) and describes action that occurs on a regular basis – for example, "My Mama be like, Clean your room," which means she tells me that all the time.

"Despite their prevalence, 'I'm like' and 'I be like' are still stigmatized as informal or even incorrect," says Peterson. "But although some may find them jarring, linguists see these expressions as something like the Swiss Army knives of reported conversation. Their versatility and usefulness means they'll probably be around for a long time." Patricia Cukor-

Avila, a linguist at the University of North Texas, says, "I tell my students, eventually all the people who hate this kind of thing are going to be dead, and the ones who use it are going to be in control."

Why the wide use and longevity? Because both usages are "brilliantly functional grammatical accommodations," says Peterson. "'I was like' is neither just 'I said' or 'I thought,' but an opening into either direct quotation or inner condition, as well as a much wider range of dramatic reenactment or, especially on the Internet, visual representation of feeling. [AAE's 'be like'] is a far more efficient way of expressing that condition than exists in mainstream English, which relies on adverbs to do the same work."

"Linguists Are Like, 'There's a Reason It's Popular!' Why a New Way to Say 'Said' Took English by Storm" by Britt Peterson in *The Boston Globe*, January 25, 2015, http://bit.ly/16anJnZ

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7. A High-School Student Pushes Back on the Literary Canon

In this opinion piece in *The Boston Globe*, Massachusetts high-school senior David Brown says that his English teacher recently confessed that she hates *The Great Gatsby*, the standard text she's required to teach to juniors. Brown believes a curriculum that mandates "classic" books is "ineffective, outdated, and almost universally loathed… For starters, not all students will relate to the same texts, and not all teachers can teach them well. A standardized and enforced curriculum takes away teachers' freedom to correct for individuality and play to their and their students' strengths."

In addition, Brown contends, uniform texts (and the test-prep mentality that goes with them) prevent risk-taking, experimentation, and creativity in the classroom. "I came into high school 3½ years ago wanting to read and write, because I love to read and write," he says. "But, as I soon found out, the things I love about books are rarely taught, and the things I love about writing are actively penalized." Despite teachers' efforts to breathe life into the curriculum, many students check out and all they learn is "how to do high-school English classes."

The solution, says Brown, is neither costly nor difficult: give English teachers more freedom to teach books they love and that students find relevant and engaging – for example, Russell Banks's *Rule of the Bone* or Cormac McCarthy's *All the Pretty Horses*.

"The Crushing Boredom of a Tired Curriculum" by David Brown V in *The Boston Globe*, January 25, 2015, http://bit.ly/1LDSsuu

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8. Short Items:

a. U.S. history map collection – This link http://www.davidrumsey.com/about has a large collection of U.S. history maps collected by David Rumsey, Cartography Associates, 2015.

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b. A statewide curriculum unit project – This YouTube video https://www.youtube.com/watch?v=rzpeLQMKLKc shows how Massachusetts educators are designing Common Core-aligned units following the Understanding by Design process.

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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.marshall48@gmail.com

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 44 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 64 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 50 issues a year).

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Core list of publications covered

Those read this week are underlined.

American Educational Research Journal
American Educator
American Journal of Education
American School Board Journal
AMLE Magazine
ASCA School Counselor
ASCD SmartBrief/Public Education NewsBlast
Better: Evidence-Based Education
Center for Performance Assessment Newsletter
District Administration
Ed. Magazine
Education Digest
Education Gadfly
Education Next
Education Week
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Educational Researcher
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Elementary School Journal
Essential Teacher
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Independent School
Journal of Education for Students Placed At Risk (JESPAR)
Journal of Staff Development
Kappa Delta Pi Record
Knowledge Quest
Middle School Journal
Perspectives
Phi Delta Kappan
Principal
Principal Leadership
Principal's Research Review
Reading Research Quarterly
Reading Today
Responsive Classroom Newsletter
Rethinking Schools
Review of Educational Research
School Administrator
School Library Journal
Teacher
Teachers College Record
Teaching Children Mathematics
Teaching Exceptional Children/Exceptional Children
The Atlantic
The Chronicle of Higher Education
The District Management Journal
The Journal of the Learning Sciences
The Language Educator
The Learning Principal/Learning System/Tools for Schools
The New York Times
The New Yorker
The Reading Teacher
Theory Into Practice
Time
Wharton Leadership Digest