Marshall Memo 550

A Weekly Round-up of Important Ideas and Research in K-12 Education
August 30, 2014

In This Issue:

Quotes of the Week

"It is deeply odd for teachers to think that teaching itself is the one thing that cannot be taught."
Robert Pondiscio in "Making Teaching Teachable" in *The Education Gadfly*, August 7, 2014 (Vol. 14, #35), http://edexcellence.net/articles/making-teaching-teachable

"[I]f teachers are to be made, after all, rather than born, then good instructional practice must be something that can be identified, named, practiced, and mastered by millions."
Robert Pondiscio (*ibid*.)

"In the end, it is not enough to be innovative. The innovations must stick."
Robert Pondiscio (*ibid*.)

"Psychologically, praise within the classroom can become problematic in that it fails to convey any genuine feedback information. Even worse, it can shift the students' attention onto irrelevant, even destructive, factors, such as excessive attention to the self or one's ability, thus discouraging further effort or listening to feedback about the task."
John Hattie and Gregory Yates (see item #1)

"Students are often reluctant to do anything that causes them to stand out from a group, and many middle-grade students are self-conscious and hesitant to expose their thinking to others. Peer pressure is powerful, and a desire to fit in is paramount."
A 2000 NCTM study (quoted in item #4)

"One can obey every rule and every stylebook ever published and still be a horrendous writer if one doesn't understand what one is trying to accomplish."
Steven Pinker (see item #3)

"[Some] writers assume too much, use jargon and abbreviations that their readers have no way of deciphering, fail to present background information that's critical to understanding the passage, and describe things at too high a level of abstraction."
Steven Pinker (*ibid*.)

1. Feedback – the Breakfast of Champions

In this chapter in *Applying Science of Learning in Education,* John Hattie (University of Melbourne) and Gregory Yates (University of South Australia) trace the history of the term feedback and offer a basic definition: "information allowing a learner to reduce the gap between what is evident currently and what could or should be the case" – in other words, guiding students to the next step they need to take.

But feedback doesn't always work smoothly in the real world of classrooms. Researchers have three observations:

- Teachers say they routinely give lots of helpful feedback to their students.
- Trained classroom observers, however, see very little teacher-to-student feedback, even with expert teachers.
- When students are asked, many report very little feedback from their teachers, typically a few seconds a day. Students do get quite a lot of feedback from their peers, but much of it is incorrect.

Hattie and Yates call this an "empathy gap" – teachers believe they're giving helpful feedback to the whole class, but students (when interviewed) say that group-level feedback "is largely irrelevant to those who have mastered an objective, and often is ignored by those who have not… many within the class are bored, tuned out, or simply focusing on other things in their life more important at the time."

Praise is a common form of feedback, but it is often unhelpful. Praise can be overdone, so that students learn, this is a teacher who praises a lot. "This is not a commodity you can increase and expect the effects of praise will increase," say Hattie and Yates. "Psychologically, praise within the classroom can become problematic in that it fails to convey any genuine feedback information. Even worse, it can shift the students' attention onto irrelevant, even destructive, factors, such as excessive attention to the self or one's ability, thus discouraging further effort or listening to feedback about the task."

Effective feedback, on the other hand, can double the rate of learning and is among the top ten influences on achievement. One of the hidden effects of feedback is the way it influences how much effort students are willing to commit. One study found that college students devote considerably more time and effort to tasks where specific and timely feedback is available, perhaps because that shows the importance the teacher places on the learning activity.

Hattie and Yates suggest that computer video games and GPS devices are excellent feedback-givers. Video games know each player's past history, pose challenges at the Goldilocks level – slightly beyond past accomplishment, not too hard, not too easy – and give feedback as the player persists for hours at a time. A GPS device guides a driver through unfamiliar territory, doesn't growl at mistakes, and maintains a patient, unemotional disposition as the driver finds his or way. Both technologies are good at knowing three important facts, all of which transfer to classroom feedback:

• *Where is the student going? What's the goal?* "Feedback does not work in a vacuum," say Hattie and Yates. "Instead, it registers discrepancy between the current state and a known objective… Each student's fundamental problem is to understand his or her world, and to feel able to control, or at least make more predictable, key elements that impact directly on adjustment within that world. One of the basal problems facing each student sitting in a classroom is assessing what to learn, how much to learn, and how much – and where – to expend effort." A challenging goal – knowing what success looks like – is essential to getting students to apply effort, but knowing there will be feedback along the way is equally important. "People work hard on difficult goals once they can perceive the availability of salient and supportive feedback," say the authors. "On the other hand, such feedback is unimportant if a goal is facile." Teachers also need to lay out a series of stepping-stone goals on the way to the eventual target. Providing "worked examples of the goal" is also helpful. And of course it's essential that teachers convey the idea that the goal is attainable and students will get there.

• *How is the student doing right now? What progress is being made?* "For goals to be effective, students need information about current achievements," say Hattie and Yates. "Feedback needs to take the form of realistic assessments as to how far along the journey the student has come, and can serve to reduce cognitive load by showing the student where in this sequence they need to exert their thinking and effort." Feedback on progress is much more helpful than grades or comparisons to how other students are doing. Lots of errors are made at this stage, and teachers have to inculcate a positive view – errors are feedback on the road to success. "Feedback must engage a learner at, or just above, the current level of functioning," say the authors.

• *What is the next step?* This builds on the first two. "Students are disinterested in past errors and post-mortems," say Hattie and Yates, "but clamor for guidance as to what to do in the future, as defined in terms of the next few minutes. The teacher's role is how to enable resources, help, instruction, and scaffolds to be in place to assist the student to know *where to next?* A clear direction has to be identified." The GPS device is a good model – it "can only look forward," say the authors. "It remains unconcerned about any past streets, suburbs, or erstwhile errors passed through on route… We may get to a location through using different roads and we may take longer or shorter to get there. But such differences are superficial since options are constrained severely by reality. At some point, all routes to one goal will converge, even though the starting points vary."

Feedback looks different at the novice, intermediate, and advanced level. Beginners need immediate feedback on content knowledge and vocabulary – lots of assurance and

correctives, as well as reassurance that they're heading in the right direction. Intermediate learners need feedback like, "Strong use of adjectives in just the right spots" and "A well-constructed argument, but have you thought of what this implies for the future?" Advanced students need help developing themselves as self-regulated learners. The teacher's task is to gradually build students' ability to self-correct, and that means becoming more critical (without negative affect) and sometimes withholding feedback as students become more proficient, spurring the retrieval process and building independent learning skills. "Once students are aware that they have some distance to travel, then 'errors' are no longer perceived as negative," say Hattie and Yates. "Errors are tentative trials rather than the endgame."

"For many students," the authors conclude, "school learning is hard, mentally demanding, and potentially energy-sapping. At the individual level, the problem is to perceive a knowledge chasm as a knowledge gap to be bridged. Such a view is aided by two other necessary perceptions: (a) that one's achievement is not limited by inherently fixed attributes such as intelligence, and (b) outcome is correlated with effort… This is the essential classroom context within which teachers' use of the feedback principle will determine how their students will elect to deploy their limited energies."

"Using Feedback to Promote Learning" by John Hattie and Gregory Yates in *Applying Science of Learning in Education: Infusing Psychological Science into the Curriculum*, American Psychological Association, 2014 (p. 45-58), http://teachpsych.org/resources/documents/ebooks/asle2014.pdf

Back to page one

2. The Fragile Dynamic Between Confusion and Learning

In this article in *The Chronicle of Higher Education*, Steve Kolowich explores the paradox that unclear teaching sometimes gets better results than clear teaching. Here's the experiment that piqued his interest. Ten years ago, Derek Muller, a doctoral candidate at the University of Sydney in Australia, made two instructional videos and showed them to students:

- The first video featured an actor explaining a basic physics concept using drawings and animations.
- The second video had two actors playing the part of a tutor and a student. The student struggled to understand the concept, and the tutor asked leading questions but didn't give clear answers. After some back-and-forth, the student got it right.

Students who watched the two videos said the first one was clear, concise, and easy to understand and the second was confusing.

But when students were tested on their understanding of the concept covered in the videos, students who watched the first one were more confident that they had learned from it but students who watched the second one actually learned more! How could an unclear instructional video teach more?

Muller believes that when students get a clear presentation of the correct information, five things happen:

- They think they know it.

- They don't pay close attention.
- They don't recognize that what was presented differs from what they were already thinking.
- They don't learn a thing.
- They get more confident in what they thought before.

Counterintuitively, a little confusion can prompt students to think harder and improve their understanding of complex matters. (For simple facts and memorization, clear, simple explanations are appropriate.)

"In other words," says Kolowich, "if teachers want students to learn really important stuff, like comprehending difficult texts and modeling complex systems, they should put their students in confusing situations." They should also not be too enamored of slick, cohesive lectures and tutorials (a word to the wise for teachers and professors who are creating videos for their "flipped" classrooms). "One can imagine a world," say Sidney D'Mello (University of Notre Dame) and Arthur Graesser (University of Memphis), "where interventions that expose misconceptions might be cherished instead of chastised, complexity might be a valuable substitute for clarity, and less cohesive texts and lectures might replace the polished information deliveries of textbooks and formal lectures."

But "confusing" teaching has to be handled skillfully. "Confusing works, except when it doesn't," he says. "Confusing students on purpose is more like loading the elastic of a slingshot: It creates tension that can propel them into higher altitudes of understanding; pull too far, though, and the elastic will snap." And some students will snap sooner than others. The trick is tracking and moderating the confusion and knowing when students need to be rescued from their confusion – but that's especially difficult when explaining things to large groups.

"Confuse Students to Help Them Learn" by Steve Kolowich in *The Chronicle of Higher Education*, August 14, 2014,
http://chronicle.com/article/Confuse-Students-to-Help-Them/148385/

Back to page one

3. A Cognitive Psychologist Talks About Good Writing

In this interview with Matt Huston in *Psychology Today*, Harvard professor Steven Pinker shares insights from his new book, *The Sense of Style* (Viking, 2014). The main impediment to good writing, says Pinker, is that people "assume too much, use jargon and abbreviations that their readers have no way of deciphering, fail to present background information that's critical to understanding the passage, and describe things at too high a level of abstraction." They're falling prey to the "curse of knowledge" – they know something and fail to put themselves into the shoes of a reader who doesn't.

Why is there so much abstract writing? Our brains evolved as our ancestors interacted with physical objects and observable events, says Pinker. But when modern humans become familiar with a subject, we can think more and more abstractly. The problem is when we write abstractly for a reader who's not as familiar with the subject matter as we are – the result is a

baffled reader. "You have to show a draft to a real specimen of your readers and probe what this person does and doesn't understand," he says.

The shortcoming of most manuals on writing, Pinker continues, is that they "present advice as dogmatic dictates, and so a writer has no way of appreciating why and when the rules contribute to good writing – and therefore is likely to apply them robotically and to misapply them. One can obey every rule and every stylebook ever published and still be a horrendous writer if one doesn't understand what one is trying to accomplish."

Pinker suggests that revision needs to be done separately from initial writing. "It's too cognitively demanding to assemble a coherent argument and to express it clearly at the same time," he says. "The order in which thoughts occur to you is not the order in which they are most easily assimilated by a reader. For the vast majority, this requires an entirely different process."

"Q & A with Steven Pinker" by Matt Huston in *Psychology Today*, October 2014 (Vol. 47, #5, p. 10), no e-link available

Back to page one

4. The "Matthew Effect" in Classroom Groups

In this article in *Elementary School Journal*, Brian Lack (a K-8 math specialist in the Forsyth County Schools, GA) and Susan Lee Swars and Barbara Meyers (Georgia State University) report on their study of four students (two high-achieving, two low-achieving) working with small groups of classmates on fractions. The teacher in this suburban middle school was making a concerted effort to promote rich discourse around real-world math problems, and the researchers took videos and followed up with interviews to see how it was working.

The focus of the study was equity – who was taking part in classroom interactions and who wasn't – and the way peer dynamics affected participation. The authors quote a 2000 NCTM study that echoed their concern: "Students are often reluctant to do anything that causes them to stand out from a group, and many middle-grade students are self-conscious and hesitant to expose their thinking to others. Peer pressure is powerful, and a desire to fit in is paramount." Lack, Swars, and Meyers noticed inequities in three areas:

• *Meaning making* – All students found it easier to solve the fractions problems at a computational level than to explain the deeper meaning of solutions to their classmates. "Students did not naturally discuss or explain their thinking," say the authors, "particularly when there was agreement about an answer among some of the group members. Instead, students were fixated on finding answers and immediately moving on to the next problem…" The authors observed:

- Higher-performing students didn't give more detailed and easy-to-understand explanations than their lower-performing peers.
- Peer-to-peer explanations weren't clearer and easier to understand than the teacher's.

- Lower-performing students were hesitant to ask for help or clarification for fear of looking stupid, and when they did ask for help, their questions were sometimes overlooked.

The main issue seemed to be, as one perceptive student noted, "a weak sense of audience awareness."

• *Unequal use of conversational space* – Lack, Swars, and Meyers found that higher-achieving students were more likely to seize opportunities to participate in small-group discussions, and lower-performing students spoke less – especially when the teacher wasn't present to facilitate the discussion and make sure students assigned to different roles were doing what they were supposed to do. "The low-performing students in this study found it difficult to keep pace with high-performing students in problem solving and what they called 'working it out'," say the authors. "The low performers reported sometimes being lost and overwhelmed with anxiety when they realized that they were significantly behind their higher-performing peers in generating correct solutions." In other words, there was a self-reinforcing dynamic – being behind produced emotions that kept struggling students from doing what was necessary to catch up.

But there was an interesting difference between the two low-performing students in the study. One was mostly silent and unassertive while the other tried to stay in the game, begging other students to "wait" or "hang on." The first student was mostly ignored by more successful students, who made no attempt to involve her in solving the fractions problems. The other student was only occasionally successful in getting help.

• *Peer status* – The two high-performing students tended to talk exclusively with each other during task discussions, especially when the math got tricky, and they often ignored or overlooked the two low-performing students. "High-performing students reported a greater level of ease and comfort in communicating with each other," say the authors, "and described the act of explaining mathematical content to low-performing students as burdensome and challenging."

Lack, Swars, and Meyers conclude that there is a strong tendency for the "Matthew Effect" to play out in classroom discussions: students with stronger preparation surge ahead and students with weaker preparation fall further behind. Here's what the authors believe teachers can do to counteract that tendency:

- There need to be explicit classrooms norms about equitable participation, with roles assigned to each student in a group so low-performing students have a clear, "official" role in the proceedings.
- Teachers need to think about putting students with widely divergent achievement levels in the same group (the researchers think the math gap between the pairs of students they studied may have been unbridgeable).
- Low-performing students need to be explicitly taught how to assertively ask for specific, clear explanations from peers.
- High-performing students need to learn how to craft clear and precise explanations so that all group members have greater access to mathematics discourse.

- Students need to be led to reflect on participation levels and group dynamics, perhaps viewing videos of group discussions. "Though video playback is not typical practice and requires the willingness of teachers to use such a method," say the researchers, "the quality of participation cannot improve without substantial reflection on the part of both teachers and their students."

"Low- and High-Achieving Sixth-Grade Students' Access to Participation During Mathematics Discourse" by Brian Lack, Susan Lee Swars, and Barbara Meyers in *Elementary School Journal*, September 2014 (Vol. 115, #1, p. 97-123), http://bit.ly/1sPQkVp

Back to page one

5. Some Surprising Findings on Kindergarten Math Instruction

In this *Elementary School Journal* article, Martha Cecilia Bottia, Stephanie Moller, Roslyn Arlin Mickelson, and Elizabeth Stearns (University of North Carolina/Charlotte) report on their analysis of the U.S. Department of Education's ECLS-K study (Early Childhood Longitudinal Survey – Kindergarten). The researchers looked at the impact of several instructional practices on student achievement:

- Manipulatives
- Drills in worksheets, workbooks, and exercises
- Interactive group work
- Music and movement

They found that some classroom practices helped all students but others had differential impact according to students' academic readiness, socio-economic status, and race. Specifically:

- Interactive group activities and giving and receiving help were associated with higher math achievement.
- More exposure to drills was associated with higher achievement, especially for students who entered kindergarten with better-developed skills and knowledge.
- Manipulatives had very little impact on the achievement of most students, and a negative impact on the achievement of African-American students.
- Music and movement had a negative impact on African-American students' achievement.

The authors qualify the last two findings by saying that there are big differences in how much and how well different teachers implement various instructional strategies. It's possible that African-American students are getting less-effective instruction with manipulatives and music/movement.

"This study shows that the quality of the curriculum is only part of the answer," conclude the authors. "There are significant differences in the way instructional practices foster or undermine the achievement of kindergarten students depending on their racial, ethnic, socioeconomic, and math academic readiness backgrounds… Mathematics instruction should be both consistent with curricular standards and tailored to benefit the diverse population of children that attend schools. Mathematics curricula, as currently implemented, seem to leave portions of the student population behind."

"Foundations of Mathematics Achievement: Instructional Practices and Diverse Kindergarten Students" by Martha Cecilia Bottia, Stephanie Moller, Roslyn Arlin Mickelson, and Elizabeth Stearns in *Elementary School Journal*, September 2014 (Vol. 115, #1, p. 124-150), http://bit.ly/1vuHHUM

Back to page one

6. Short Item:

Free student perception survey questions – Panorama Education, a start-up developing and analyzing student opinions of their teachers, has just released a free, open-source set of questions that are quite distinct from the Tripod Project's items. You can access Panorama's survey here: http://panoramaed.com/panorama-student-survey

Back to page one

Do you have feedback? Is anything missing?

If you have comments or suggestions, if you saw an article or web item in the last week that you think should have been summarized, or if you would like to suggest additional publications that should be covered by the Marshall Memo, please e-mail: kim.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 43 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
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Education Digest
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Journal of Staff Development
Kappa Delta Pi Record
Knowledge Quest
Middle School Journal
NASSP Journal
NJEA Review
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 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