

FROM THE RESEARCH DESK: "Thinking about Teaching Thinking Part 1, What's the Urgency?"

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Virtually every educational reform initiative of the past decade or more, every educational critic, and every national study of what's wrong with, and what will be needed in U.S. education in the future, calls for teaching our young people to be thinkers – analytical problem-solvers, imaginative and creative, critical thinkers. In this "From the Research Desk" I will explore this crucial and timely topic of "Thinking About Teaching Thinking" in two parts: Part I, in this issue of *Connections*, will look at what the problem is, why is it so important to develop these abilities in our students, what's the evidence that they are not becoming the kind of thinkers being called for, and why now? Then, in our summer issue of *Connections*, I will continue with Part II, possible solutions, what we can do about it, and how might we teach these skills.

I begin with our working definition of "critical thinking" from Daniel Willingham, Professor of Psychology at the University of Virginia and author of "Ask the Cognitive Scientist" column in the *American Educator*. "From the cognitive scientist's point of view, the mental activities that are typically called critical thinking are actually a subset of three types of thinking: reasoning, making judgments and decisions, and problem solving." (We may find this definition too narrow, too limiting, and possibly incomplete, but more on that later!). What follows is a sampling from some of our best educational thinkers on the crucial importance of teaching thinking (the titles alone speak volumes).

I begin with the most recent book by Tony Wagner, Co-Director of the Change Leadership Group at Harvard's Graduate School of Education. In *The Global Achievement Gap: Why Even Our Best Schools Don't Teach the New Survival Skills Our Children Need – and What We Can Do About It*, Wagner states a number of facts about our current high school students., For example:

"The high school graduation rate in the United States – which is about 70% of the age cohort – is now well behind that of countries such as Denmark (96%), Japan (93%), and even Poland (92%) and Italy (79%)."

The United States now ranks tenth among industrial nations in the rate of college completion by 25- to 44-year-olds.

Sixty-five percent of college professors report that what is taught in high school does not prepare students for college. One major reason is that the tests students must take in high school for state-accountability purposes usually measure 9th or 10th grade-level knowledge and skills. Primarily multiple-choice assessments, they rarely ask students to explain their reasoning or to apply knowledge to new situations (skills that are critical for success in college)...."

Based on several hundred interviews with business, non-profit, and education leaders, Wagner goes on:



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“I have come to understand that there is a core set of survival skills for today’s workplace, as well as for lifelong learning and active citizenship – skills that are neither taught nor tested even in our best school systems.... The First Survival Skill: Critical Thinking and Problem Solving.... In one form or another, the ability to ask good questions has been a recurrent theme in almost all of my conversations about core competencies and skills for success in today’s workplace. The habit of asking good questions was most frequently mentioned as an essential component of critical-thinking and problem-solving.... Equally important, they are skills that our kids need in order to participate effectively in our democracy.”

Yong Zhao, born and raised in China and now a distinguished Professor at Michigan State University, has written a recent critique of U.S. education, *Catching Up or Leading the Way: American Education in the Age of Globalization*. He summarizes a number of recent studies, including the “Partnership for 21st Century Skills,” “Engage 21st Century Skills: Literacy in the Digital Age,” and the “Recommendation of the European Parliament and the Council of European Union.”

“Underlying these proposals is the recognition of a number of core assumptions, which can be used to guide our decision about what schools should teach.... Assumption #4: Cognitive skills such as problem solving and critical thinking are more important than memorization of knowledge.... What is common across all is an emphasis on high-level cognitive skills.”

And in the preface to his book, Zhao explains its title:

“...what China wants is what America is eager to throw away – an education that respects individual talents, supports divergent thinking, tolerates deviation, and encourages creativity; a system in which the government does not dictate what students learn or how teachers teach; a culture that does not rank or judge the success of a school, a teacher, or a child based on only test scores in a few subjects determined by the government.”

So there is not only this somewhat newer recognition of a “global achievement gap” between the U.S. and other countries in developing thinking skills, but the more familiar “achievement gaps” between white and

students of color, between those students from families of wealth and those from poverty, students with and without “disabilities,” and between what it took for young people to be prepared for the 20th-century and what it now takes to be prepared for a future world of globalization in the 21st-century.

Mike Schmoker is an education writer, speaker, consultant, and author of *Results Now: How We Can Achieve Unprecedented Improvements in Teaching and Learning*, and *FOCUS: Elevating the Essentials to Radically Improve Student Learning*. In a short piece he wrote in the April 2012 issue of *Phi Delta Kappan*, “Can Schools Close the Gap?,” he identifies one of the major causes of these “gaps” is “disastrous literacy practices.” Referring to various recent studies, he notes that too many students get to college and “can’t read the textbooks in any discipline they encounter.” He also reports that “students write very little and receive even less instruction in academic, argumentative writing despite the immense effect such writing has on intellectual development and readiness for post-secondary studies.”

Lisa Delpit, Professor of Education at Southern University in Baton Rouge, Louisiana, also speaks to this issue in her new book [see my Review on page 15 in this issue of *Connections*]. In the chapter entitled “Picking Up the Broom: Demanding Critical Thinking,” she describes the following all too common situation in many of our urban high schools, those primarily serving students of color:

“What does it look like to demand critical thinking in classrooms serving low-income students of color? A native Alaskan teacher recounted to me a favorite story about her own schooling, which provided this teacher with the perspective she needed to teach her students in her own village. She says that her one Native teacher in a high school with a population of all Native students and otherwise white teachers once placed a broom on the floor of the classroom. As the students entered class, they all stepped around or over the broom. After all the students were seated, the teacher picked up the broom and began to lecture them. ‘Why didn’t any of you pick the broom up?’ Did they think it belonged on the floor? Who were they waiting for to tell them what was right? The message of the lesson was contained in her repeated word, ‘You cannot afford not to think! No one will think for you, and if they do, they mean you no good!’”

One of the most recent books to sound this alarm, published in 2013, is by Nel Nodding, Professor of Education, Emerita, at Stanford University. In *Education and Democracy in the 21st Century*, she notes: ***“Several major themes will guide our thinking throughout this book.... A third is to bring critical, analytical thinking to our work as educators.... While some 20th century ideas should be abandoned, others should be revived, analyzed carefully, and reevaluated. Critical thinking, for example, was mentioned as an educational aim throughout the 20th century, and it still appears prominently on lists all over the world. Indeed, it is more important today than ever, not only because of the increasing sophistication of technology but because we are trying to move toward a participatory democracy that is capable of deliberation.”***

Echoing this concern about developing students for a “participatory democracy” and using the often stated need for “21st century skills” is the article “Learning 21st Century Skills Requires 21st Century Teaching.” This article, in the October 2012 issue of *Phi Delta Kappan*, was written by Anna Saavedra and V. Darleen Opfer, a Policy Researcher and the Director of RAND Education at the RAND Corporation of Santa Monica, California. They state:

“Globalization, economic necessity, and low civic engagement compound the urgency for students to develop the skills and knowledge they need for success.... Regardless of the skills included or the terms used to describe them all 21st-century skills definitions are relevant to aspects of contemporary life in a complex world. Most focus on similar types of complex thinking, learning, and communication skills, and all are more demanding to teach and learn than rote skills. These abilities are also commonly referred to as higher-order thinking skills, deeper learning outcomes, and complex thinking and communication skills.”

Several authors over the past two to three decades, a period in which we have seen the unprecedented expansion of technology and media, have expressed deep concern that this new “information/digital age” is leading to the development of students who don’t think deeply about anything. When so much information about everything and anything is available in a nano-second, speed seems to be taking over the teaching of thinking. Here is a sampling of those who are sounding this alarm, beginning in 1990 with Jane Healy, an educational psychologist, teacher, educational consultant, and adjunct faculty member of Cleveland State University. In *Endangered Minds: Why Children Don’t Think and What We Can Do About It*, she reports:

“I developed a questionnaire requesting anecdotal information on cognitive changes observed in students. I handed it out at national meetings and conferences to experienced teachers in schools where population demographics had remained relatively stable. Approximately three hundred teachers responded, and I was amazed by the unanimity of response. Yes, attention spans are noticeably shorter. Yes, reading, writing, and oral language skills seem to be declining – even in the ‘best’ neighborhoods. Yes, no matter how ‘bright,’ students are less able to bend their minds around difficult problems in math, science, and other subjects.”

The second is by Alan November, internationally respected consultant in integrating technology across the curriculum, whose workshop I attended more than ten years ago.

“Imagination is more important than knowledge. For knowledge is limited, whereas imagination embraces the entire world, stimulating progress, giving birth to evolution.”
— Albert Einstein

He began that workshop with this story of Zack (also found in the beginning of his book, *Empowering Students with Technology*):

“The Danger of Ignorance – A fourteen-year-old named Zack was asked what he was learning in school by his retired neighbor. Zack answered, ‘I’m working on a history paper about how the Holocaust never happened.’ The neighbor was incredulous. ‘Zack, where did you hear that the Holocaust didn’t happen?’ ‘I found it on the Internet in my high school library. Concentration camps were really clinics to help the Jews fight typhus carried by lice....’ [turns out Zack had stumbled on a website by a professor who promoted this bizarre theory].

“Zack was fully equipped with all the technical expertise necessary to access the Internet. But his school failed to provide him with the tools to make sense of the information.... Many young people can be deluded by a false sense of confidence when they think they know what they are doing. Students and adults alike too often mistake technical mastery with critical thinking. Increasingly, students will become victims to the expansive dark side of the Internet unless we teach the critical thinking skills necessary to make meaning out of the overwhelming and potentially manipulative amount of information that is now available and growing every day.” [this book was written in 2001!]

The third I'd like to show you is the most recent, written in 2011. I reviewed Nicholas Carr's *The Shallows: What the Internet Is Doing to Our Brains*, in the September 2012 issue of *Connections* but felt it needed to be cited again briefly here. Carr raises the concern that our contemporary media-saturated lives are producing young people who are “shallow,” not “critical, analytical, creative thinkers,” possibly because of subtle, yet pervasive changes to their brains:

“While acknowledging that it’s now hard to imagine living without the Internet and online tools like the Google search engine... their heavy use has neurological consequences. What we’re not doing when we’re online also has neurological consequences. Just as neurons that fire together wire together, neurons that don’t fire together don’t wire together. As the time we spend scanning Web pages crowds out the time we spend reading books, as the time we spend exchanging bite-sized text messages crowds out the time we spend composing sentences and paragraphs, as the time we spend hopping across links crowds out the time we devote to quiet reflection and contemplation, the circuits that support those old intellectual functions and pursuits weaken and begin to break apart. The brain recycles the disused neurons and synapses for other, more pressing work. We gain new skills and perspectives but lose old ones.”

Lastly, I return to Daniel Willingham and his book, *Why Don't Students Like School?: A Cognitive Scientist Answers Questions About How the Mind Works and What It Means for the Classroom*. He describes nine key cognitive principles, the first of which relates directly to our question about teaching thinking – “People are naturally curious, but we are not naturally good thinkers; unless the cognitive conditions are right, we will avoid thinking.” Willingham goes on to explain this surprising and disturbing principle:

“Your brain serves many purposes, and thinking is not the one it serves best. Your brain also supports the ability to see and to move, for example, and these functions operate much more efficiently and reliably than your ability to think... It’s no accident that most of your brain’s real estate is devoted to these activities. The extra

Test your own problem solving abilities: In an empty room you find a candle, some matches, and a box of tacks. The goal is to have the lit candle about five feet off the ground. You've tried melting the bottom of the candle and sticking it to the wall, but that wasn't effective. How can you get the lit candle five feet off the ground without having to hold it there?*

Solve this in 20 minutes.

(Solution on back page.)

brain power is needed because seeing is actually more difficult than playing chess or solving calculus problems.”

He then enumerates three properties of the thinking brain to explain why thinking is so difficult:

“First, thinking is slow...Your thinking system does not immediately take in a visual scene. Second thinking is effortful; you don’t have to try to see, but thinking takes concentration. You can perform other tasks while you are seeing, but you can’t think about something else while you are working on a problem. Finally, thinking is uncertain. Your visual system seldom makes mistakes, and when it does you usually think you see something familiar to what is actually out there – you’re close, if not exactly right. Your thinking system might not even get you close; your solution to a problem may be far from correct.”

Thus, hopefully you can begin to see why teaching thinking is not only crucial to our students in the 21st century, and why it’s essential in leveling the educational playing field by closing the various “achievement gaps” between our students. I hope to have also referenced enough authors and books here to begin describing why it’s so difficult, how it may even involve limitations of and changes to our brains, and why it’s thus so hard to teach.

So stay tuned for our summer issue of *Connections* and “Thinking About Teaching Thinking, Part II: How Can We Do It?” We will look at specific strategies to address the issues raised today in “Part I: Why the Urgency?” Be prepared for an expanded, more holistic definition/understanding of thinking that includes creativity, imagination, feelings, intuition, even emotions; all essential aspects of thinking. — *Dave Lehman*

(Did you try the problem-solving puzzle on the previous page? If not, go try it now. You can find the correct solution on the last page of this issue of Connections.)

