

What Does It Mean To Think Like A Teacher?

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At any given moment, the disciplines represent the most well-honed efforts of human beings to approach questions and concerns of importance in a systematic and reliable way. (Howard Gardner, The Disciplined Mind, p. 144)

What they never tell you is that when you're eleven, you're also ten, and nine, and eight, and seven, and six, and five, and four and three, and two, and one. (Sandra Cisneros, "Eleven," from The House on Mango Street)

As a small child, according to Howard Gardner, you form powerful theories about how the world works (1995, p. 2). When, as an infant, you come to terms with the fact that your mother leaves the room, and then you work your way toward a theory that allows for her continued existence and for her eventual return, you're going to rely on that theory. You will formulate it out of your lived experience, then test and re-test it. It will be activated and reinforced every time your mother leaves a room, then later returns. Not only are you going to remember this theory,

you're going to operate by it. Constructed over time, vetted through testing and re-testing, it is self-authored and put into practice. Of course it is powerful; it is authentic learning. This applies to all sorts of phenomena—why it gets dark at night, why flowers bloom in the spring, why you love to read and hate the dark. Your young mind is hard at work through those early years.

The fact that we already have deeply embedded theories about how the world works is, Gardner argues, one of several reasons that academic learning in schools tends toward the superficial. We don't just "believe" our theories. We invented them; we live by them. Formed out of experience and honed through repeated testing, they aren't on the table for critique. That's why, according to Gardner, "even students who have been well trained and who exhibit all the overt signs of success—faithful attendance at good schools, high grades and high test scores, accolades from their teachers—typically do not display an adequate understanding of the materials and concepts with which they have been working (p. 3).

Our intuitive theories can be interrupted, Gardner argues, when we think disciplinarily. We change, for example, not when we study grammar but when we think like writers; not when we read a textbook, or fill out a worksheet, or memorize a list of facts from history but when we think like historians. It begs a question though: What does it mean to think like a writer, or like a historian?

According to Gardner, "performances of disciplinary (or genuine) understanding...occur when students are able to take information and skills they have learned in school or other settings and apply them flexibly and appropriately in a new and at least somewhat unanticipated situation" (p. 9). This presents a delightfully rich challenge to classroom teachers. It reinforces the imperative toward invoking prior knowledge in any lesson and is congruent with contemporary practices around both project-based learning and deeper learning. Thus, when we ask a youngster to "think like a scientist" as she engages in an experiment on gravitational pull, we must first invoke her prior knowledge, her compelling, intuitive theory about how gravity works. We must ensure that it is present so that it can be interrupted.

Then we must provide the counterpoint to that—a lesson that invites, that compels her to "think like a scientist." This is nicely congruent

with the project-based model of curriculum development, the hallmarks of which are inquiry, student agency and connection to the world beyond school. While the power of this contemporary model is being explored, articulated and developed, it is quite counter-cultural to our ingrained model. One approach to maintaining a project-based learning (PBL) mindset is to continually ask how practitioners in the world are applying the concepts we introduce in schools.

A disciplinary mindset is invoked when the humanities teachers at my school run a writing workshop—because that’s what writers do; when math students think like programmers, applying principles of mathematics as they create video games; when physics students think like engineers applying basic principles of physics as they build a car. When our school’s learning specialist asked to see the car-builders’ physics notes, they claimed they had not taken notes, but when she asked them to explain the physics, they were happy to explain and elaborate (and strikingly adept at it).

As we design engaging activities to enable students to go deep, to engage with course content in authentic and meaningful ways, and to think about the ways in which their understandings transfer to situations in the world beyond the classroom, we should ask how would a writer/historian/scientist approach this task? What does it mean to think like a writer? Like a scientist? Like a historian? Even more wonderfully challenging: What does it mean to ask a first grader or a third grader or a tenth grader to “think like an historian,” or a scientist or a writer?

Teaching is a Cultural Activity

There is another, perhaps more profound, layer to the challenge facing teachers, and the teachers of teachers. In their 1999 book *The Teaching Gap*, Stigler and Hiebert reported on their work in the Third International Mathematics and Science Study, known as the TIMSS Study. Their comparative study of eighth grade mathematics classrooms in Germany, Japan and the USA revealed differences in classroom practice from the use of bell time, worksheets, and questions, to the ways in which students greeted teachers, interacted with each other, and approached the challenge of a new problem.

One of their conclusions is that teaching is a cultural activity—so much so that the most conservative teacher in the United States looks more like the most progressive teacher in the United States than like a teacher in either Germany or Japan. Anticipating that “there would be great variability in teaching methods within the United States” (p. 11), they reported instead “as we looked again and again at the tapes we collected, we were struck by the homogeneity of teaching methods within each culture, compared with the marked differences in methods across cultures” (p. x). While there are certainly marked differences in teaching styles and philosophies among and between American teachers, Stigler and Hiebert discovered that “these differences, which appear so large within our culture, are dwarfed by the gap in general methods of teaching that exist across cultures” (Stigler and Hiebert, p. x).

What does this mean, that teaching is a cultural activity? It means, according to Stigler and Hiebert, that “we learn to teach indirectly, through years of participation in classroom life, and we are largely unaware of some of the widespread attributes of teaching in our own culture” (p. 11). It means that the toddler in Gardner’s model, who observes the world and forms powerful theories about where her parents go when they leave the room and why it gets dark at night, will continue to engage in that activity several years later, as she sits in a classroom, observing the behaviors of teachers and students, including herself. She will, again, form powerful models of what it means to inhabit this world—in this case, the world of “school.”

Notions like homework, tests, and report cards are part of that model. Appropriate behavior; what is “academic” and what is not; what constitutes “important” or legitimate subject matter and what does not; how we define “mastery” and how that is demonstrated (even the very use of the term “mastery”)—all of these are formed, as in Gardner’s model, personally, through observation and analysis, through repetition and application. Notions about school and schooling are constructed in the deepest sense. They are not what we “believe.” They are what we know and come to understand intuitively—“in our bones.”

What does this mean for teacher education and school reform? It means that much like the superficial learning that too often occurs

in K-12 classrooms, teacher education programs and programs of professional development are relegated to the superficial. Stigler and Hiebert are quite direct about it: “the fact that teaching is a cultural activity explains why teaching has been so resistant to change” (p. 12). And in the same way that students’ deeply-held, intuitive theories must be invoked so that they might be interrupted, so, too, must we extract our deeply held understandings of school and teaching, not only so that we might examine them critically, but so that we might reinvent them.

According to Stigler and Hiebert, “the cultural nature of teaching gives us new insights into what we need to do if we wish to improve it” (p. 12). Their recognition of the deep power of culture allows us recognize and frame the larger structures of what we are trying to address systemically, and provides a lens through which to reflect on many of the smaller cogs in the machinery—the tropes and mindsets that we act on from deep habit with roots in a system that took form long before any of us ever set foot in a department of education, or sat in a classroom desk. It allows us to find clarity in contemporary learning practices as we move away from the ingrained habits of disciplinary specialists doling out content, designing lesson plans in isolation and closing the door when class starts, to a collaborative model in which we work in teams to design contexts in which students discover and apply knowledge, skills, and understandings. This is where we begin to understand what it means to “think like a teacher.”

The Essential Question

What *does* it mean to “think like a teacher?”

Is education a discipline? Or is it a “meta-discipline,” the core concern of which is to worry about teaching the other disciplines? A complex array of questions unfolds: Indeed, what *does* it mean to think “disciplinarily?” What does it mean to think like a scientist? To what extent does that differ from what has been going on in science (or history, or English) classrooms for the past century?

Traditional transmission-mode classrooms are not centered on formulating and articulating questions. But professionals in the field—in any field—engage in research. And research is always in response

to questions. That is, in fact, what keeps work focused, what allows you to make sense of it. So how do you “think like a scientist?” Is it as simple as asking scientific questions and applying the scientific method of observation, hypothesis, and testing?

If Gardner is correct that the way to change a youngster’s understanding of the world is to find ways to compel him to “think like a scientist,” then it follows that the teacher’s question is, “how do I get a nine-year-old (or a 12-year old, or a 15-year old) to think like a scientist?” If “thinking like a scientist” means posing research questions, then attempting to answer those questions through experimentation, does it not follow that “teaching” science means helping youngsters to pose, refine, and frame appropriate research questions, followed by the construction of appropriate means of exploration and experimentation? Simply put, professionals who are engaged in research begin by asking questions.

In this reflexive model, the question, “what does it mean to think like a teacher?” leads us immediately to consider what it means to ask students to think disciplinarily. “What does it mean to think like a scientist or a writer?” is accompanied by questions about cognition and brain research and how learning happens, about what is socially, emotionally, and developmentally appropriate. These are the research questions that teachers ask. The complexity of the question-within-a-question, along with concerns with methodology and child development, elements of teaching not rooted to a specific discipline, make teaching one of the most intellectually complex, challenging, and engaging of professions.

Jo Boaler (2008), in *What’s Math Got to Do With It*, claims that “school math is widely hated, but the mathematics of life, work, and leisure is intriguing and much more enjoyable.” There are, she says

Two versions of math in the lives of many Americans: the strange and boring subject that they encountered in classrooms and an interesting set of ideas that is the math of the world, and is curiously different and surprisingly engaging. (p. 5)

Boaler uses the terms “mathematical thinking” to describe what she wants teachers to ask of youngsters. She says, “children need to solve complex problems, to ask many forms of questions, and to use, adapt, and apply standard methods as well as to make connections between

methods and to reason mathematically” (p. 12). She describes a process of teaching youngsters not only to ask questions, but of teaching them “the qualities of a good mathematics question” (p. 154). Students’ good questions were posted around the room. Students were invited to extend problems by “posing their own questions.”

Boaler and her graduate students encouraged “mathematical *reasoning*. Students learn to reason through being asked, for example, to justify their mathematical claims, explain why something makes sense, or defend their answers and methods to mathematical skeptics” (p. 154). Additionally, students articulate their understandings through “representations” that might include graphs, charts, diagrams, etc. They engage in many activities that involve the flexible use, interpretation and adaptation of mathematics and mathematical thinking.

The inquiry-based, authentic approach that Boaler is developing and advocating stands in opposition to classroom practices that she and Stigler and Hiebert bemoan: “The traditional K-12 mathematics curriculum with its focus on performing computational manipulations, [which] is unlikely to prepare students for the problem-solving demands of the high-tech workplace” (p. 8).

In humanities classrooms, the question “what does it mean to think like a writer” leads to authentic inquiry in writing workshops, as students ask questions of their peers: what works in this piece, and how can I make it stronger? In genuine, collaborative inquiry, they hone their writing skills. My colleague, Dana Huff, observes, “if we write professionally, we expect to have an editor. No one says we don’t really know how to write on our own if someone edits our work. No one says we’re cheating. Yet, with students, I have heard teachers argue that students need to write in isolation.”

Once teachers begin thinking this way, project-based learning becomes second nature, and inquiry, student agency and application to the world beyond the classroom become deeply rooted in meaningful curriculum created by teams of teachers engaging in their own meaningful work.

Conclusion

Culture is intractable. It runs deep, is largely subconscious. Jung referred to it as the “collective unconscious.” Freud referred to

“archaic remnants.” To claim that culture is resistant to change is a profound understatement.

This cultural moment, this paradigm shift we are experiencing in education, is a confluence of evolving factors, including constructivism, brain research, inquiry-based education, and the ubiquity of knowledge in the digital age. All of that is for naught if we cannot interrupt the cultural stranglehold of our habits and mindsets. The correlation of Gardner’s theory with Stigler and Heibert’s findings leads us to profound insight into the necessity of invoking prior knowledge and understandings as we continue to learn how to teach and learn in this new paradigm.

One of the principles of the Coalition of Essential Schools is that “The principal and teachers should perceive themselves as generalists first and specialists second” (Coalition of Essential Schools). As teachers, we are both students of how children learn, and passionate specialists in one or more disciplines. Those disciplines might be traditional or emerging, singular or cross- or trans-disciplinary, but they constitute the context from which we engage our students in the real work of the world beyond the walls of the school, to discover the pleasures to be found in looking at a problem through various lenses—the lens of the scientist, the venture capitalist, the journalist, the social scientist.

As generalists first, we are, asSizer noted, engaged in the process of teaching kids to “use their minds well.” This does not preclude being thoroughly versed in one or more subject areas, even in imagining—in partnership with our students—new and trans-disciplinary subject areas. We too, have an imperative to “use our minds well.” As we fearlessly invoke our own prior knowledge and deeply held understandings in order to challenge and disrupt them, we ask ourselves fundamental questions—what is school, homework, rigor? Why do they matter? *Do they matter?*—we are reinventing schools and reinventing ourselves. We are thinking like teachers.

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