



THE CENTER *for* TRANSFORMATIVE
TEACHING & LEARNING
AT ST. ANDREW'S EPISCOPAL SCHOOL

The Bridge

v.1.5

Welcome back to *The Bridge*, the monthly newsletter of the Center for Transformative Teaching and Learning. Each month *The Bridge* analyzes a specific aspect of teaching and learning through a Mind, Brain and Education Science research-informed lens.

A Wintertime Mulling Recipe

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Winter vacation is good mulling time. And of the many things we might mull, the mind of a teacher might on occasion turn to what great things we could do next. With this in mind, I would like to drop in a nugget of wisdom from one of our favorite brilliant minds in education, Professor Rob Coe at Durham University in the U.K.. When asked what is theory of learning was, Rob Coe, legend has it, paused as if for dramatic effect, then said, "Learning happens when people have to think hard." He immediately added that this is a vague, over-simplistic and unoriginal statement, but that it does lead to a question that, if teachers had it buzzing in their heads, might lead to better learning: "Where in this lesson will students have to think hard?"



(Can you guess the mountains?)

From a neuroscience standpoint, thinking hard leads to greater rewiring of neural network - what we refer to as learning. Passive experiences, such as just being "exposed to something" do not reshape the brain. As Professor Kurt Fischer put it, "we need to actively work on the objects that we are experiencing anew." When we learn, new ideas and information are being mapped onto existing knowledge stored in long-term memory - and this creates actual physiological changes in our brain. If nothing has changed in long term memory, we cannot say that learning has happened. We should be teaching with a mind to changing long term memory (and resist whenever we can the urge to teach with a mind for short term "accessibility"). Thinking hard is crucial to making this happen.

So where in your lesson will students have to think hard? Mull this over, but with the following points in mind. In full disclosure, we are now veering away from the "research evidence informed" path, but think of these as strategies to operationalize an idea that is rooted in research, and it is based on ideas from two highly enjoyable British educationalists, Martin Robinson and David Didau.

1. The Importance of Relationships

Relationships underpin our ability to do everything. They certainly underpin our ability to get students to dig deep and think hard in areas that stretch their level of comfort - and stretch it in any one of many ways. How do we push students to think hard? It begins with strong positive relationships.

2. Content Knowledge

Content knowledge is really important. Students need to be thinking hard about the right things (thank you David Didau for this line[i]). Robust content knowledge should be built strategically - using techniques from our last Bridge article! There is an idea from the most wonderful small book on teaching that might be helpful here. It is the difference between priming and painting. If you are re-painting the walls in your house, a casual observer may see you with a roller in your hand - but are you painting? Or are you priming?[ii] Building content

knowledge may often be the precursor to thinking hard. But can we pick times to add "thinking hard" to this phase of learning? We can intersperse active learning segments into lectures to force students to interact with the ideas. We might also simply make this phase hard, knowing that our planned spacing and interleaving means they will see the key information again. But as you plan heavy content delivery classes, mull over, "how will I get my students to think hard?"

3. The Body Dialectic

Students need to use their newly constructed body of content knowledge. Explore ideas through questioning, critiquing, arguing, or whatever dialectic method that your professional opinion as a teacher and your mastery of the subject matter knowledge suggests. There is never one right answer, and you are the professional in the room, so have fun choosing. But make room for dialectic, make sure it is grounded in well-chosen content knowledge and, very importantly, have the thought buzzing in your head, "how will I get my students to think hard?"

4. New Contexts

Having had some experience manipulating and exploring a body of knowledge, now have students take aspects of this knowledge and apply them and explore them in a new context. Maybe the context is of the student's choosing, maybe the teacher's, or maybe a hybrid. Use student choice wisely as a spice to foster deep cognitive engagement with the task, but with sufficient judgment to nudge the choice into avenues that will lead students towards thinking hard. The task might be open-ended, but the teacher might instead have a set goal in mind, or it might be somewhere in between. Again, you are the professional, and your professional judgment - a combination of your great subject knowledge and knowledge of the craft of teaching - of where to go exploring is key.

5. Scaffolding and Strategies

What do individual students need to support this learning journey from content knowledge, to dialectic exploration, to trying it out in new contexts? And how readily can you begin peeling these scaffolds away? Remember, students need to think hard to learn, so don't cosset - but what can you give to help them over the frustration hump to help them stay in the game and think hard?

If steps 2 - 4 sound familiar, it may be because they are essentially the trivium, a teaching methodology with ancient roots, but which has been revitalized by Martin Robinson.^[iii] 'Trivium' is a phrase coined in the Middle Ages for the educational concept of grammar, dialectic and rhetoric developed in ancient Greece. For a long time a cornerstone of a "classical" western education, the essential nature of the trivium, as represented by Robinson, holds up well to MBE research:

Step 1: Grammar - learn the knowledge base

Step 2: Dialectic - use the knowledge base in discussion

Step 3: Rhetoric - expand the idea to somewhere new and communicate it

Learning, remember, involves mapping new ideas and information onto pre-existing knowledge stored in long term memory. How does this happen in your class? Our goal with this article is to help guide you in crafting strategies that will work for you and all the contexts of your subject, your classroom, and your own personal voice as a teacher. Thinking hard will look very different in each of our classrooms. But whether you use aspects of this guide or not, we do want you to have buzzing in your head, to an annoying degree, where will people have to think hard in this class?

[i] Didau and Rose, What Every Teacher Needs to Know about Psychology.

[ii] Rocha, A Primer for Philosophy and Education.

[iii] Robinson, Trivium 21c: Preparing Young People for the Future with Lessons From the Past

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