UNIVERSITY AT ALBANY
State University of New York

Teaching at Albany

Spring 2018

Mark Your Calendars for *ITLAL Spring Events*

May 21, 2018
Designing and Facilitating In-Class Activities
9:30am-12:30pm
Lecture Center 3C

In this half-day intensive workshop, you will learn and practice strategies for activity design, as well as methods of debrief and discussion, to help ensure that the outcomes of learning activities align with your expectations.

May 23, 2018
Summer Teaching Boot Camp (for Graduate Students)
9:00am-1:30pm
Lecture Center 3A

In partnership with ITLAL, the UAlbany Future Faculty Leadership Council (FFLC) is hosting a workshop for graduate student instructors in summer teaching roles. You will leave with practical strategies and immediately implementable tools for boosting student engagement and using class time efficiently.

June 6 & 8, 2018
Instructional Leadership Academy: Course Design
(By application)
9:30am-3:30pm
Lecture Center 3C

Whether you're teaching a new course or revisiting material that you've taught before, it's useful to slow down and do the work required to create a coherent set of learning experiences for your students. Join us for this opportunity to take the time to design (or re-design) a course for deeper, more lasting learning.

To learn more about our events and services, please contact us.

http://www.itlal.org
518-442-5521
teachingandlearning@albany.edu

Small Teaching for Deep Learning

Big changes in student learning require big changes in our teaching, right? Not necessarily! James Lang's most recent book, *Small Teaching: Everyday Lessons from the Science of Learning* (2016), offers teaching strategies that are manageable, evidence-based, and effective. Many of these strategies can be used to help our students begin thinking more like disciplinary experts.

Research suggests that a key difference between novice and expert thinkers in a field is the way we organize or make connections within and across a large body of knowledge (Bransford et al., 2000). Experts are able to connect new knowledge with prior knowledge, recognize and articulate how big concepts in our disciplines connect to each other, and examine our own thinking so that we can locate and fill gaps in our understanding. All of these intellectual moves are nearly intuitive for experts but very challenging for our novice students, and they need practice to build their conceptual networks. Most importantly, they need to do that practice in our presence so that their current thinking is visible and available for our feedback. Lang offers several small teaching strategies designed to help students develop "a denser, more richly connected network of knowledge and skills in your course content areas" (p. 96) and provide opportunities for us to respond to their emerging understanding of thinking in our disciplines.

Connecting New Knowledge with Prior Knowledge

If we want to help students build these richer networks, we must begin by surfacing their prior knowledge in ways that reveal their confusions, mistakes, and emerging conceptual understanding. When we demonstrate our expert knowledge through lectures and modeling, that prior knowledge is neither surfaced nor activated, and we are robbed of the chance to see how students are organizing and crafting conceptual connections. When students watch us work through problems, they are lured into a false sense of understanding. Because we act with expert fluency, they perceive the task as simpler than it really is. But how can we successfully activate students' prior knowledge so that their understanding can change and grow?

Lang offers a strategy called ***What do you already know?*** to "solicit and address existing knowledge networks" (p. 101). Before we teach students, we need to know what they already know about our subjects—and more importantly, how they are making use of and making sense of what they know. Let's see how this strategy might work in an Informatics class where the teacher wants to know how students approach the central disciplinary process of sequencing code. At the start of class, the teacher gives the students five possible sequences for a line of code. Two of these sequences work, two of them reflect typical novice mistakes that are important to address, and one of them can only work under specific conditions. Each option thus represents a different way that students may have organized some key principles at this early stage of their learning. Students choose which sequence is best and then compare their answers with other students and come to a group consensus. The teacher can get a clear picture of students' prior knowledge and how they are using it in the early stages of their learning about Informatics. Giving students feedback on these naïve attempts prepares the students to receive and integrate newer, more expert ways of thinking about coding into their current understanding.

Connecting across Concepts

In addition to integrating more expert ways of thinking, students also need to develop a network of conceptual connections that helps them make sense of our disciplines. One strategy to help them articulate these connections is the ***Concept Map***, which usually involves asking students to create a visual representation of their conceptual connections within or between the big ideas or principles of a discipline. Lang warns us that concept maps are often misused because teachers ask for a simplistic map of novices' concepts. For example, in a Social Policy course, simply asking students to create a concept map of their current understanding of a policy analysis framework may merely result in students recreating a chart they remember from the textbook. A more effective way to require students to explore and develop their conceptual connections is to have them create more focused maps as a response to a meaningful disciplinary question. For example, the teacher of the Social Policy course asks students to read about a policy on urban poverty and then respond to this prompt: "Draw a concept map that shows what key concept or concepts from the policy analysis framework would be the central focus in a critique of this policy and which concept or concepts would be ancillary. Be prepared to explain and defend how you are prioritizing specific concepts." After students have created and justified the organization of their ideas represented in the concept maps, the teacher gives them a quite different policy on urban poverty and asks them to create a different concept map so that they begin to see how the concepts in the framework can be re-prioritized depending on contextual variables surrounding the policy.

Another strategy for making thematic or conceptual connections is the ***Minute Thesis***, an "ideal small teaching activity: free, easy, and capable of use in any size class, for any length of time you wish, from 10 minutes to the full class period" (p. 106). The minute thesis works this way in Lang's Literature course: Lang writes the titles of the novels the students have read in one column on the board; in a second column he writes the themes that they have seen so far in the semester. A student is asked to go to the board, circle a theme, and then draw lines connecting that theme to two novels. But the real work comes next when students are given one minute to come up with a thesis for an argument that explains how the two novels are connected to that theme. Students share their ideas with the class and when enough new connecting arguments have been made, a new student comes to the board and draws her connections. Lang tells us that not only do students practice the deep thinking practice of connection making (and of course explaining that connection), but also they "gain some practice in what might seem to them the mysterious process of coming up with new or original ideas" (p. 108). The minute thesis is easily adaptable to any discipline: one column on the board can be homework problems and the other column can be core principles or concepts. In a course like Physical Chemistry, one column could contain key concepts such as the three laws of thermodynamics, entropy, equilibria, and so on; the other column could contain five diagrams of real world objects whose behavior can be explained using the key concepts in the first column. While students may initially be tentative about explaining the connections between concepts and phenomena in any field of study, requiring them to practice this expert habit of mind helps them forge and build upon these connections for future use.

Connecting Mindfully

When we use any of these small teaching strategies to help students build and develop expert-like conceptual connections, Lang emphasizes that the teacher's job is made easier because the students are now doing the work of learning. Rather than lecture and demonstrate, we require students to build their own conceptual connections. And then, as Lang puts it, our job is to "be present as the guide and expert who can provide feedback on their discoveries, and help nudge them in productive new directions when they get stuck or stray too far from what you know works for experts in the field" (p. 109). At the same time, Lang realizes that the most effective teaching pushes students to become their own guides who monitor and provide feedback to themselves as they develop new, rich conceptual networks.

In his chapter "Self-explaining," Lang introduces us to a powerful teaching strategy supported by some intriguing research. Self-explaining means requiring students to step back from the disciplinary work they are doing and explain their thinking to themselves (or to you), either out loud or in writing. This chapter points us to seminal research that identifies self-explaining as the key difference between undergraduate students' successful and unsuccessful attempts at solving Physics problems. Chiu and Chi (2014) found that successful students did much more "self-explaining" than unsuccessful students: they mindfully explained to themselves the inferences they were making as they solved problems, drew on Physics principles as they made these explanations, monitored their comprehension, and paraphrased problems and principles in their own words. In other words, these students used self-explaining to create a richer set of connections between problems, readings, principles, and their emerging understanding.

This kind of self-explaining is essential to developing the mental connections that support deeper thinking, and Lang offers a manageable strategy to prompt students to self-explain: the ***Why are you doing that?*** strategy. We can use this strategy in class by circulating through the class while students are working and asking them questions like "Why are you doing that?" "What reason is guiding your choice?" or "What principle are you using?" The goal is to require students to identify the mental work they are doing or need to do and articulate their thinking about that work. As students describe the choices they are making, they can examine their thinking to see if it is being guided by core concepts—or they may realize that their thinking is not well connected to core concepts. Self-explanations can provide effective feedback to support student thinking because we (and they) can now "see" that thinking. This small teaching strategy can also be used when students are working on their own outside of class. Before they turn in drafts of projects or papers, we might require them to annotate a few pages, slides, or tables and explain what principles or strategies they used to guide their work. As students explain their thinking, they recognize how they are or are not using the big themes, principles, or practices of the discipline. Self-explaining through annotations deepens students' thinking by pushing them to connect their work to the core of our courses and our disciplines.

What other small teaching strategies might help you?

These four small teaching strategies for making and explaining connections provide just a taste of the ideas in Lang's book. In addition to a section on teaching for deep learning, *Small Teaching* also offers strategies for effective retention of information and for motivation. As we work to push our students to think in more expert ways and to find the inspiration and joy in learning, it is easy to push ourselves too hard. Lang's book reminds us that often, less work on our part will mean greater change in our students' learning. We encourage you to take the small teaching steps of browsing Lang's book in our ITLAL library or meeting with an ITLAL consultant to implement small teaching strategies in your own courses!

References

Bransford, J. D., Brown, A. L., & Cocking, R. R. (Eds.). (2000). *How people learn: Brain, mind, experience, and school: Expanded edition.* Washington, DC: The National Academies Press.

Chiu, J. & Chi, M. T. H. (2014) Supporting self-explanation in the classroom. In V. A. Benassi, C. E. Overson, & C. M. Hakala (Eds.), *Applying science of learning in education: Infusing psychological science into the curriculum* (pp. 91-103). Retrieved from the Society for the Teaching of Psychology: https://teachpsych.org/ebooks/asle2014/index.php

Lang, J. M. (2016). Small teaching: *Everyday lessons from the science of learning*. San Francisco, CA: Jossey-Bass.

INSTITUTE FOR TEACHING, LEARNING AND ACADEMIC LEADERSHIP
UNIVERSITY AT ALBANY STATE UNIVERSITY OF NEW YORK
LI B69
1400 WASHINGTON AVENUE
ALBANY, NY 12222-0001