

Small Teaching

From Minor Changes to Major Learning

James M. Lang, Ph.D.

The Power of Small Changes

“Much of what we’ve been doing as teachers and students isn’t serving us well, but some comparatively simple changes could make a big difference.”

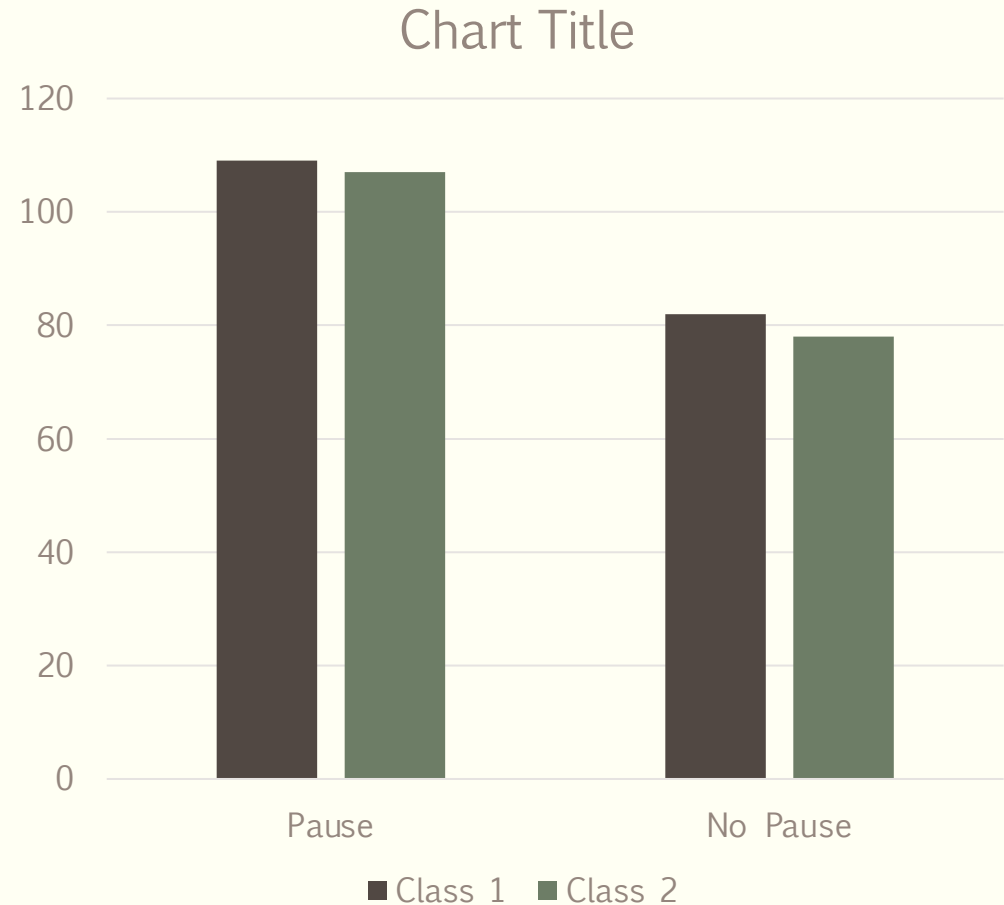
Brown, Roediger, McDaniel

Make it Stick



Pausing for Learning

- “In the current study the procedure consisted of pausing for 2 minutes 3 times during each 45-minute lecture. During the pause, subjects formed dyads and discussed lecture content (e.g., asked each other for clarification of concepts or caught up on notes). No instructor-subject interaction occurred during the pauses.”





Small Teaching Innovations

- **Brief** (5-15 minute) interventions into individual learning sessions
 - **Limited** number of interventions or activities within an entire course
 - **Minor** changes to course design, assessment structure, or communication with students
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Overview

Small Teaching



Retrieval (QA)



Connection



Inspiration

RETRIEVAL

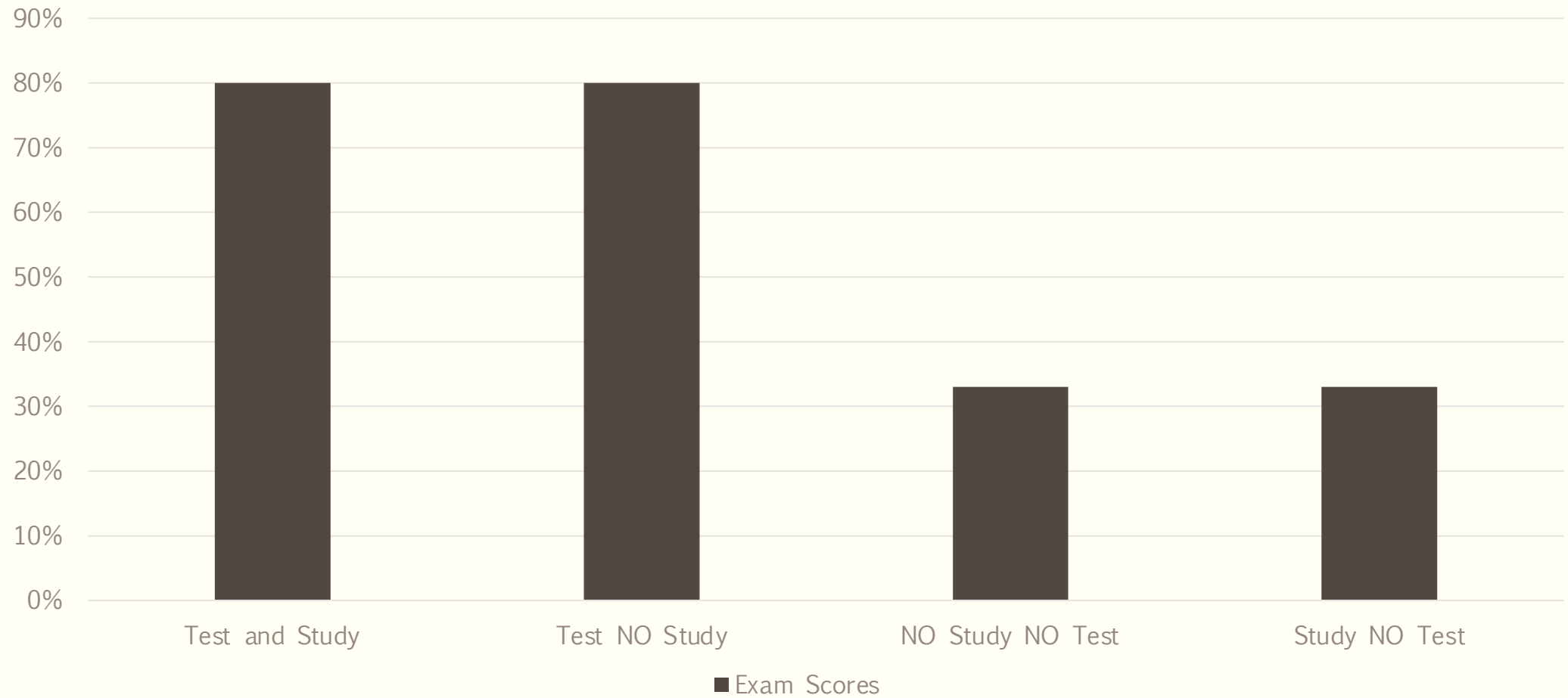
Mastering Foundational Knowledge

Knowledge: “The Hidden Power” of Cognition

“Learning skills grow organically out of specific knowledge domains—that is to say, facts . . . The wider your knowledge, the more widely your intelligence can range and the more purchase it gets on new information.”

Ian Leslie, *Curious*

Retrieval Practice in the Laboratory



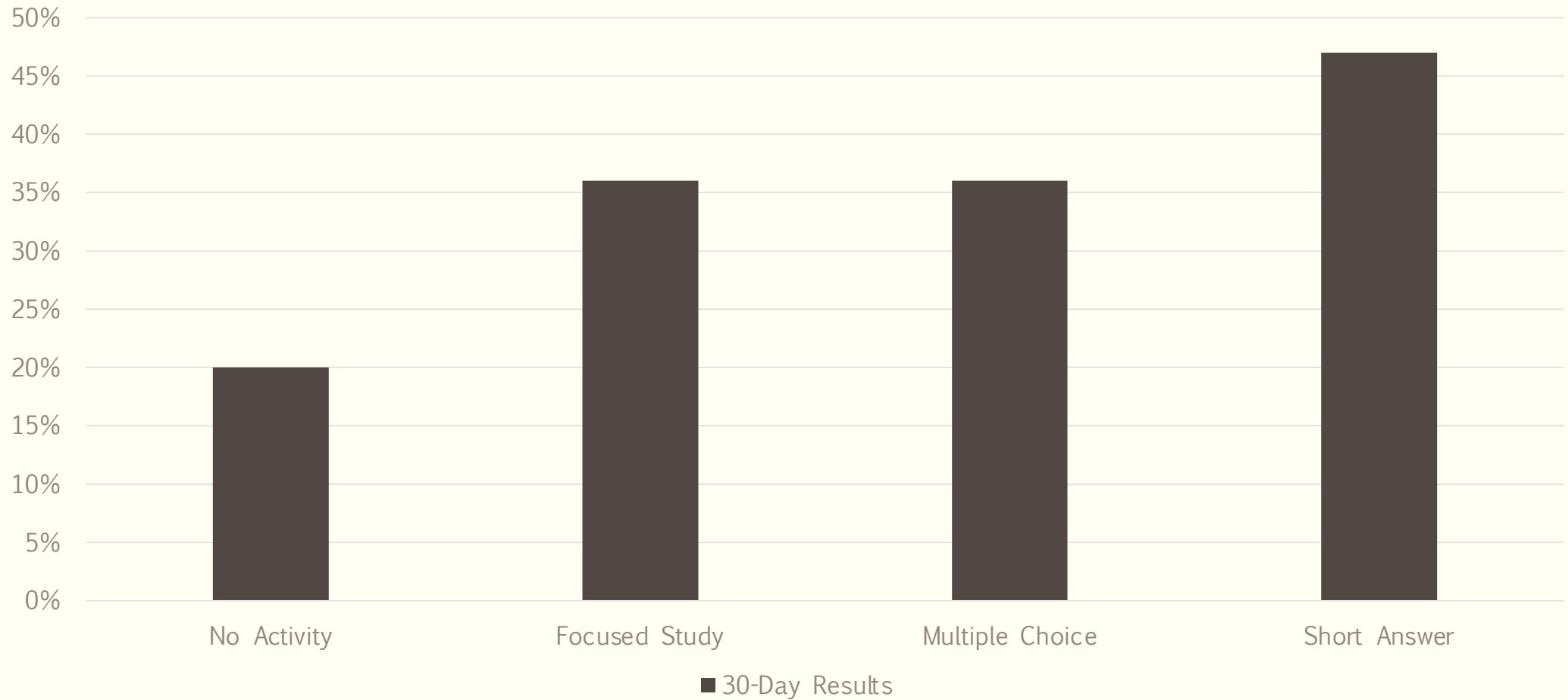
The Importance of Retrieval Practice



“In long-term-memory the limiting factor is not storage capacity, but rather the ability to find what you need when you need it. Long-term memory is rather like having a vast amount of closet space—it is easy to store many items, but it is difficult to retrieve the needed item in a timely fashion.”

Michelle Miller

Thinking to Retrieve



Opening Questions

- What did we talk about last time?
- What did we talk about last week?
- What are the most essential facts on this topic?



Closing Questions

What is one thing I learned from our class readings?

What is one thing I learned from today's class?

What am I unclear or would like to know more about?

Low-Stakes Quizzing

Polling

Limited Re-Takes

Two-Stage Quizzes

Dropped Scores

Small Teaching: Retrieval

- Open class by asking students to *“remind” you of previous content or summarize readings.*
- Close class by . . . asking students to *write down the most important concept from that day* (i.e., the minute paper) and *one remaining question.*
- Use quizzes to help students master core knowledge—*lower stakes and allow for mistakes.*

CONNECTION



Transfer

- **Transfer:** Expecting that students will apply the course content or skills they have learned in our courses to novel situations
- **Example:** Students will transfer skills learned in composition to writing assignments in other courses . . . and to their professional careers.

However . . .

“Transfer does not happen easily or automatically. Thus, it is particularly important that we ‘teach for transfer’—that is, that we employ instructional strategies that . . . help students **make appropriate connections** between the knowledge and skills they possess and new contexts in which those skills apply.”

How Learning Works

Letting Students Make the Connections

“We don’t have to make the connections for them; in fact it is much better if we don’t. We can just throw a concept out there, like a ball, and ask, “What does this remind you of that you’ve encountered in your everyday life?” When students hit the ball back, they come up with the most wonderful examples and ideas that give them not only an efficient path to learning and mastery, but also *the most efficient path for them.*”

Saundra McGuire

Teach Students How to Learn

Connections to Prior Knowledge

- What do you know about this topic already?
- What have you learned in previous classes about this topic?
- What are people's general impressions of this topic? What might they know or not know about it?

First Day of Course

Unit Starters

Lecture Openings

Connection Notebooks

- Describe one way in which the day's course content manifests itself on campus or in their home lives.
- Identify a television show, film, or book that somehow illustrates a course concept from class.
- Explain how today's material connects to last week's.
- Articulate how that day's material connects to something they learned in another course.
- How would you connect today's material to any current political/economic/social debate we are having?

Quick-Write or Pair Questions: Can You Think Of...

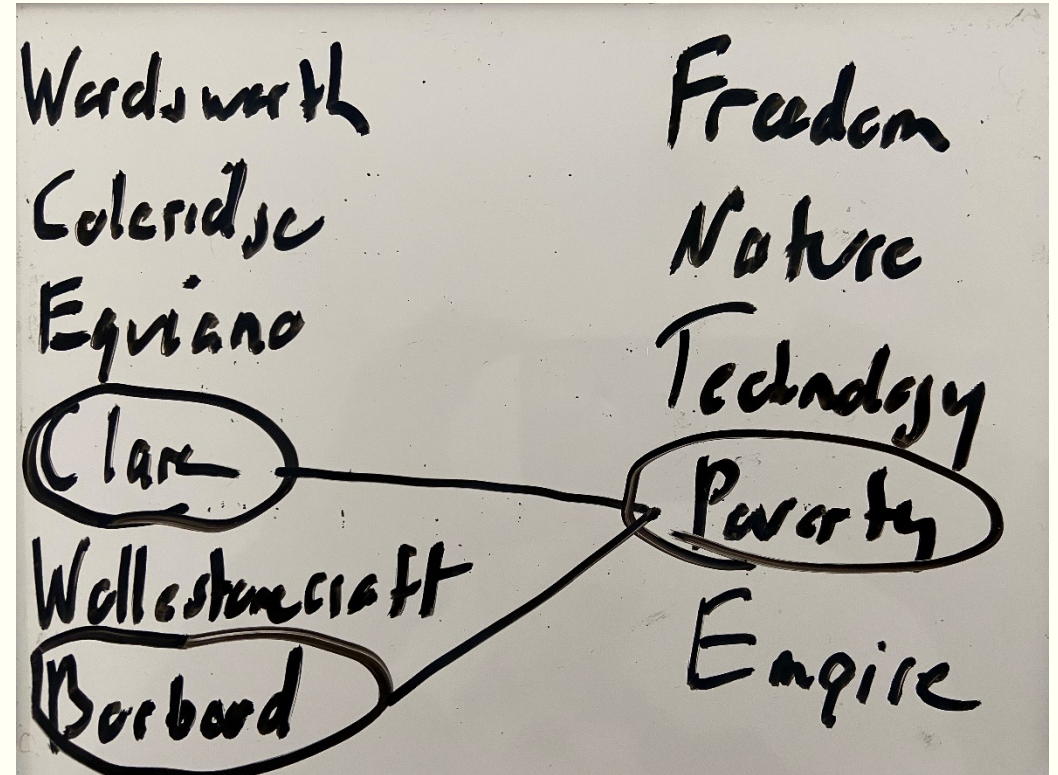
An Analogy: What's It Like?

An Example: Where Have You Seen It?

A Reason: Why Does It Matter?

The Minute Thesis

- Put course material in categories.
- Invite students to draw lines between items.
- Give them the opportunity to theorize a connection between the items.
- Discuss their ideas, and do it again.
- Conclude with an opportunity for students to record a great idea.



Small Teaching: Connections

- *Invite students to make connections to their prior knowledge* at the opening of courses, units, and lectures.
- *Use connection notebooks or discussion posts* to help students connect course material to their lives.
- At the end of the semester, play the *minute thesis game* in order to allow students to theorize new connections in advance of final exams, paper, or projects.

INSPIRATION

Question-Driven Learning

A Box of Content

The focus of this course is on nutrient uptake and translocation, nutrient deficiency symptoms, plant primary and secondary metabolism, physiological responses to biotic and abiotic stresses, hormones and signal transduction, defense and immune responses. The laboratory component of this course will provide opportunity for students to have hands on experience and assess plants physiological behavior by determining metabolites content and enzymes activities and studying hormones and nutrients.



The Power of Questions

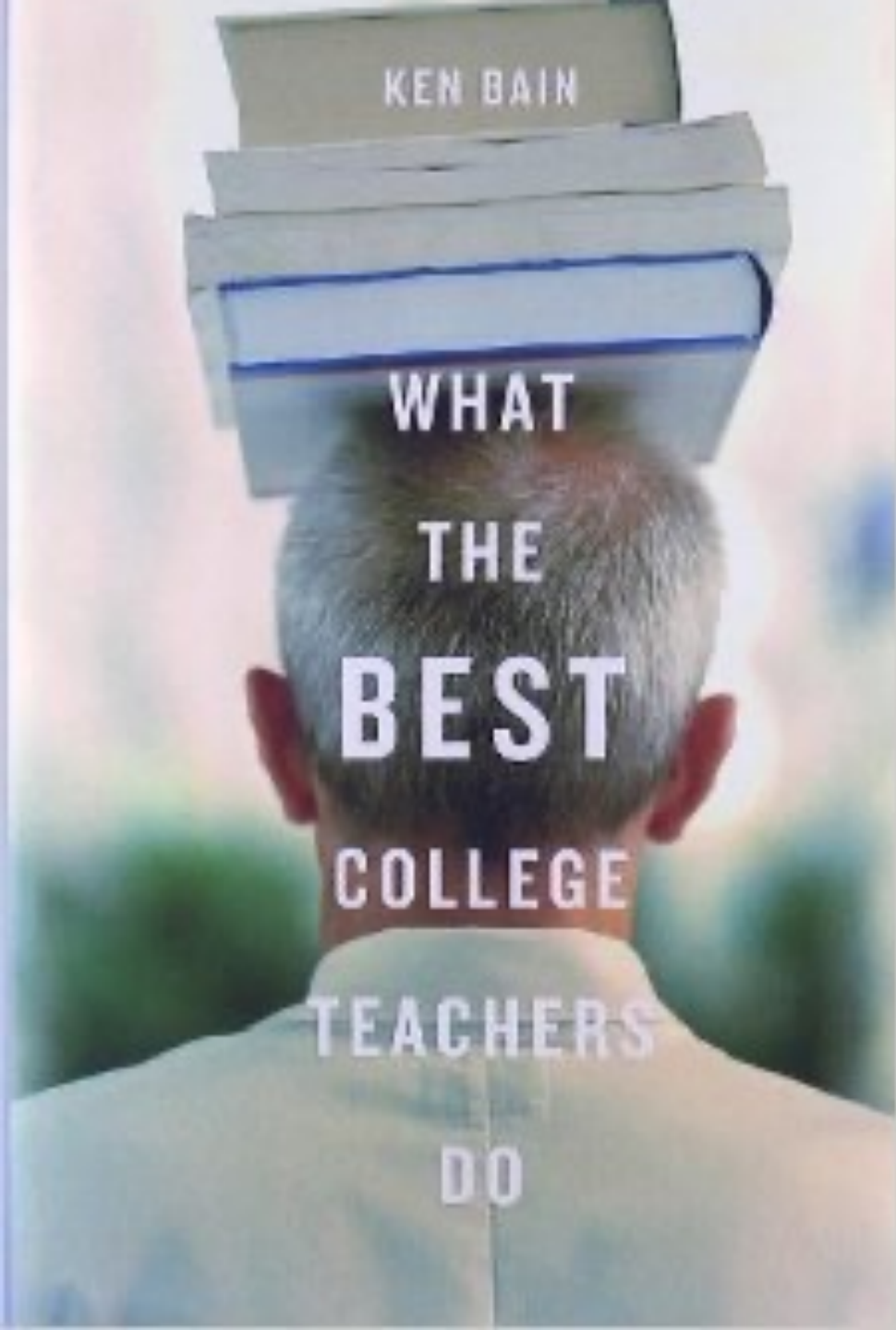
“The material I want students to learn is actually the answer to a question. *On its own, the answer is almost never interesting.* But if you know the question, the answer may be quite interesting . . . we, as teachers, are so focused on getting to the answer, we spend insufficient time making sure that students understand the question and appreciate its significance.”

Daniel Willingham

Why Don't Students Like School?

What the Best Teachers Do





Building a Learning Experience

1. Articulate Problem or Question
2. Explain Significance or Relevance
3. Give Students Opportunity to Answer
4. Provide Answer
5. Conclude with Problem or Question

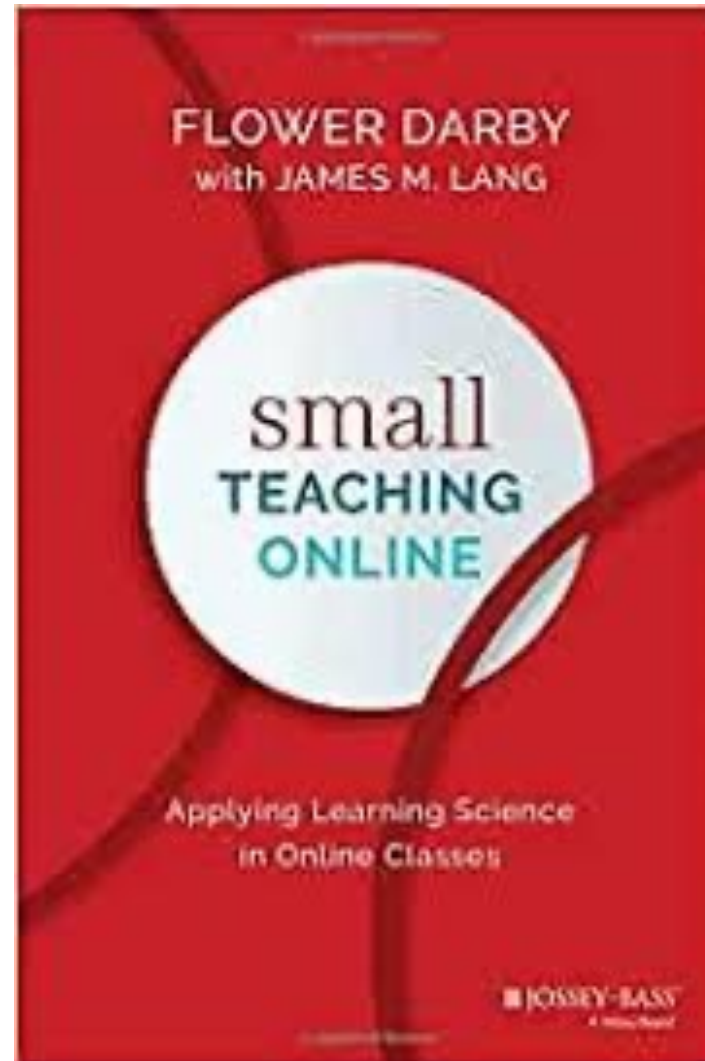
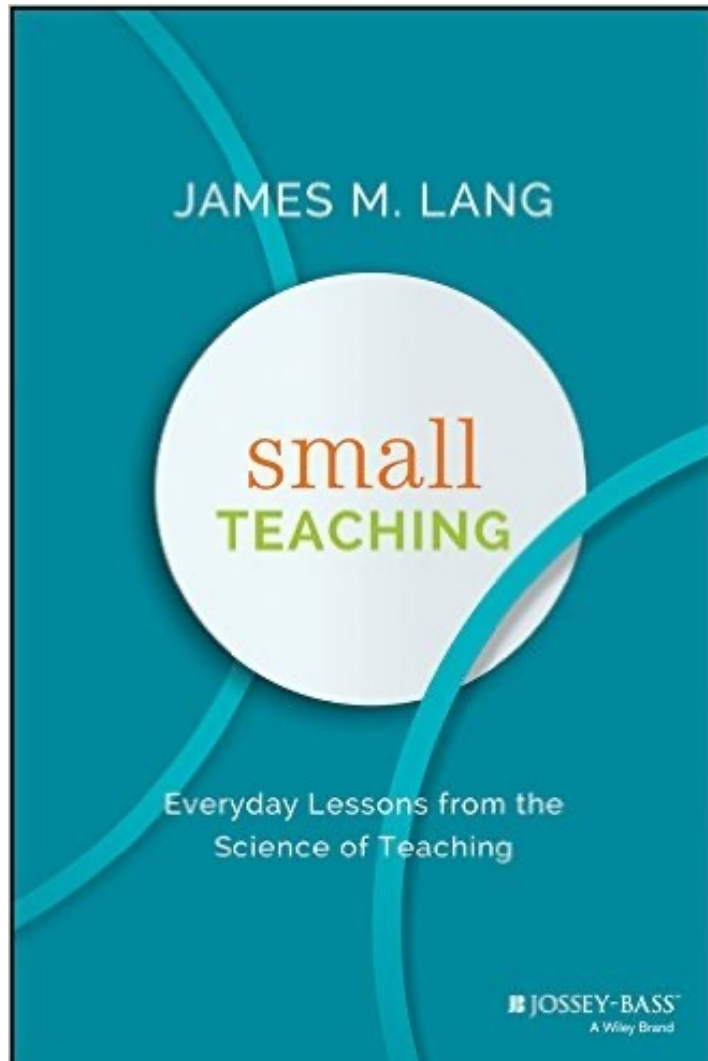
A Question-Driven Syllabus

Can you be confident that the person sitting next to you on the bus is really a human rather than some remarkable replica conjured up by a mad scientist or, perhaps, an alien from another planet? What evidence is needed to conclude that the person casually looking at her mobile device is human? . . . How have we constructed the conceptual boundary between what we qualify as human and what we categorize as robotic, animal, android, or alien? What, in the end, makes the human “human”?

James Egan, Brown Univ.

Small Teaching: Designing

- *Re-write your syllabus description* in order to highlight fascinating questions or problems that can drive the learning in your course.
- Design *opening-day or initial course activities* that introduce students to the potential challenges, problems, or questions of your discipline, and give them the opportunity to wrestle with them.
- Begin *lectures* with quick descriptions of intriguing cases or problems in your discipline (and give students the opportunity to think about and discuss them).



More
Information
and
Resources . . .