

# EXECUTIVE SUMMARY

Students  
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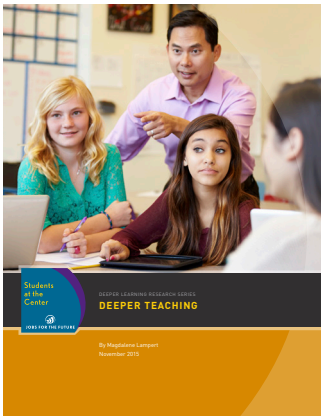


JOBS FOR THE FUTURE

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## DEEPER TEACHING

By Magdalene Lampert



Most high school students are accustomed to learning in two ways: by listening to the teacher and by reading books and other texts. And in a sense, these familiar ways of learning work for them, so long as their teachers demand only that they grasp and remember the given content. However, if the goal is to help students learn in more intellectually sophisticated ways, then teaching and learning will have to look quite different.

This paper describes what the author calls “deeper teaching,” referring to the kinds of instructional strategies that teachers will need to adopt in order to help students learn deeply.

What does it *look like* to teach to deeper learning competencies? What can one do in a classroom to give students opportunities not only to understand the academic content but also to identify themselves as strong learners, contribute meaningfully to discussions, succeed at working through difficult assignments, set ambitious academic goals, monitor their own progress through school, and so on?

### WHAT DOES DEEPER TEACHING LOOK LIKE? A COMPARISON

The author examines how one piece of “core content”—widely understood to be central to the secondary school curriculum—is taught in two very different classrooms.

The first of these two lessons typifies the sort of instruction that is most common in secondary schools across the United States. The second features a teacher who is at the same point in the curriculum, introducing the same content, but who makes a deliberate effort to support students’ deeper learning.

The examples focus on algebra, specifically the concept of slope, which is usually treated as a distinct subject area sometime between eighth and tenth grade. Studying algebra can be an exercise in memorizing formulas and rules, as is the case in much of U.S. education. By the time students arrive at high school, most have come to believe they are not “cut out” to do much more than basic arithmetic. Or, algebra can be an introduction to a powerful mathematical language that people can use to describe patterns and make predictions, as well as an opportunity to learn how to learn in new ways.



What does it *look like* to teach deeper learning competencies?



Deeper teaching is enormously complicated, and it is and always has been rare in U.S. classrooms.

### **Teacher A: Providing a Conventional Introduction to Slope**

The paper offers a close description, based on the author's own observations, of a typical lesson in Ms. A's classroom. She begins by introducing two formulas and demonstrating how to plug values into one of them to find the slope of a line. She asks students to write those formulas in their notebooks and gives them a textbook definition of the new academic term "slope." She builds her introduction on terms that students have heard before: quadrant, horizontal, vertical, axis, and origin, and on their representations in graphical form, which students should have learned to make. She is quite animated—speaking, drawing, and showing slides she has prepared—and students appear to be "on task," actively listening, watching, and copying material into notebooks.

These interactions between teacher and students will seem entirely familiar to most readers: the teacher talks, and the class sits facing the teacher, usually taking notes. And if students talk at all, it is to give answers to the teacher's questions, which the teacher judges to be correct or incorrect. This form of teaching has persisted in the U.S. for more than a century. Teachers do it because it is what they have experienced themselves, it is the way they were taught, and it is what many students and parents expect them to do. But while Ms. A's teaching could be considered satisfactory, it does not fully engage students, and it does not support deeper learning.

### **Teacher B: Teaching the Same Content Deeply**

In the second lesson, Ms. B engages her students in a very different way of "doing school," involving much less teacher-talk, more discussion among students, and more time spent working through interesting problems and sharing solutions. As the author describes in detail, Ms. B makes a number of very deliberate choices about how best to introduce her students to the material, and she opts not to use some familiar classroom techniques that Ms. A appears to take for granted.

For example, instead of presenting an abstract mathematical formula and then assigning students to use it to solve practice problems—a familiar pattern in most classrooms—she starts by giving her students a set of graphs and some written narratives describing real-world scenarios (in this case, having to do with driving a car from Boston to New York City). In each, the distance from Boston is related to how much time has passed since the beginning of the trip. (Formally, one might say that the distance from Boston is a *function* of time, and the *rate* at which the distance *changes* in relation to time is what determines the steepness of the lines.) The students' task is to figure out which narrative goes with which graph, which means having to make sense of the concept of *rate of change*, which, in turn, gives them a reason to know the term "slope" and how and why one would calculate it.

In short, Ms. B's goal is to build a foundation for understanding the meaning for terms and formulas that students will learn in subsequent lessons. By starting with familiar scenarios, she provides a conceptual anchor that will secure them as they go on to work with abstract symbols, reminding them how their calculations relate to real-world situations and problems.

At the same time, Ms. B also wants to help her students feel secure about their *ability* to move into unfamiliar academic and professional territory in the future. Thus, she gives them a task—matching graphs to narratives—that allows them to learn an important and interesting new concept in a single class period. And rather than faulting students for not knowing this concept already, Ms. B repeatedly seizes on opportunities to build on what they do know, encouraging them to explain how the graph shows that the car is headed toward or away from Boston, or that it has speeded up or slowed down, or stopped or turned around. Also, she familiarizes them with a classroom routine—explaining that it will become a regular feature of the class—that involves collaboration, student-to-student communication, and oral presentation. Moment by moment, she is careful to anticipate students' concerns about how they come across in public, and she invites them to

participate in ways that minimize the social risks involved in speaking up in class (which researchers have found to be a serious impediment to active participation in classroom discussion) and in working with peers to solve challenging problems.

## **CONCLUSION: MOVING TOWARD DEEPER TEACHING**

In order to enact deeper teaching, the teacher needs to make a myriad of decisions—some while planning a class and others on the spot, while teaching that class—about what content to teach, how to build on students’ current understanding of it, how to engage them in talking about that content in public, how to show them that there’s no shame in getting the wrong answer, how to convince them that they can and will learn material that now seems to lie beyond their abilities, how to design activities that will get pairs and groups of students to work together productively, and so on. Deeper teaching is enormously complicated, and it is and always has been rare in U.S. classrooms. So, then, how can large numbers of teachers learn to manage this kind of complexity and provide this sort of instruction on a regular basis?

One option is to provide the sort of structured support and tools that Ms. B has received as a new teacher. The lesson described here was developed through a process of repeated observing, planning, teaching, and analyzing her own use of specific teaching routines, known as “Instructional Activities.” These are, in effect, well-designed templates for organizing classroom instruction, outlining activities that feature problem solving, communication, collaboration, and support for students’ learning to learn and to develop academic mindsets. When the use of Instructional Activities is woven into teacher preparation and professional development, the cognitive load of

ambitious teaching is reduced, so that the teacher can pay close attention to students, their understanding of the given content, and their participation in the classroom.

### **How can Deeper Teaching Happen more Broadly?**

The question inevitably asked about any ambitious instructional reform is whether it can improve the quality of teaching beyond a single classroom, school, or district. Researchers find that it is when educational resources are coordinated systematically, that large-scale change can be initiated and sustained. Indeed, Ms. B is part of a coherent, though small, system of instructional improvement. She is working in a group of teachers who use the same set of Instructional Activities, which in this case are aligned with the Boston Public Schools’ academic goals and targets, and the Massachusetts Curriculum Frameworks. These are, in turn, aligned with one another and with the Common Core State Standards. Similar systematic instructional approaches to deepening teaching and learning are occurring in several places around the country.

All of these systems disrupt the conventional relationships among teacher, students, and content with deliberate, practice-sensitive designs for instruction. Each design is based on answers to a set of fundamental and closely related questions.

- First, what do we think students need to learn?
- Then, what do we know or believe about how those things are learned?
- And finally, how should the classroom be organized to make learning possible?

It is only in the particular interactions between a teacher and a class that an instructional design can be implemented in a way that utilizes its power to achieve the learning goals that its designers embrace.



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