

## **Standards and Testing as Constraints and Affordances**

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### **VEXATION**

In my current position as an assistant professor of education at CSU Chico, every discussion I have with student teachers inevitably refers to educational standards or standardized testing. All discussions now lead down the same road regardless of the content, whether it concerns service-learning projects, inquiry-based science teaching, modeling and argumentation in science, differentiating instruction, or teaching science for social justice. The question from the students is always the same: “Can we really do *[insert here any educational innovation]* when we have to teach to all these standards in order to get our students ready for state level tests?” This ubiquitous and often frustrating discourse arises from the tension created by two opposing forces: teacher education programs designed to supply student teachers with the tools needed to be agents of change, and an educational system dominated by teaching to standards and tests that promotes a more technocratic view of teachers’ work. In my world, and I believe in many others as well, this is the profound tension of our time, one that demands some resolution. Hence, my vexation and venture concerns working within this tension. I will apologize now for my lack of solutions, as I am at somewhat of a loss and consider my venture to be the promotion of civil discourse about this issue at the Crossroads conference.

I will first address the issue of educational standards. To avoid the dichotomous argument over whether or not to have standards, I agree that any profession, as evidenced by the recent collapse of the financial sector of our economy, needs to have some kind of standards. The question for many therefore focuses upon what form these standards should take. The current standards for science education in California can be found at <http://www.cde.ca.gov/be/st/ss/>. The standards are content focused, laying out the facts and concepts that students will learn at each grade level. The standards are written to build scientific knowledge deemed necessary for student success in the current as well as subsequent years, resulting scientific knowledge deemed appropriate by those who devised the standards.

My critique of such standards lies in both their focus and their specificity. The focus upon content ignores many processes central to science: inquiry, problem solving, modeling, and the building of evidence-based arguments. As a result, innovative approaches to science education remain largely ignored. Further, the specificity of the standards leaves little room for teachers to cover any material outside of these well-defined boundaries. The standards then serve primarily as a tick list of facts and concepts to be covered. Such micro-management of content leaves little room for teacher agency. If we agree that the work of teachers involves getting to know students’ interests, motivations, and resources and then creating curriculum that will be authentic and engaging, the current specificity of our standards greatly constrains a teacher’s ability to connect content with the lives of their students.

Standardized tests further constrain teachers’ work by encouraging student learning at low levels of human cognition. Most standardized test items are of the multiple-choice variety, which for the most part, evaluate student understanding of facts and concepts. While working as a consultant helping states align tests to standards, I conducted item analyses of hundreds of test items. Only in rare cases did the multiple choice items go beyond the lowest levels of human cognition. Given that teachers want their students to perform well on such tests, they tend to teach to these lower levels of cognition. They do so as they often base their instruction on their knowledge of previous test items and release questions made available by state departments of education. One of the results, as demonstrated by a small learning community of science teachers with whom I currently work, is that the students actually prefer traditional lectures, as these are the easiest means to transmit low-level forms of factual information. The tests in their current format therefore promote the elimination of innovative science teaching.

Combining micro-managed standards with standardized tests then creates a lethal blow to science teacher professionalism. A focus upon knowledge level content-based standards and the preponderance of student learning at the lowest levels of human thinking promoted by multiple choice tests greatly constrains the work of teachers. This is especially true of student and beginning teachers who feel profound political pressure to support their students’ performance on standardized tests in order to keep their jobs.

Hence, when I work with student teachers, especially those who are currently engaged in their practicum experiences, many of my attempts to provide them with the tools to become innovative teachers to promote change are thwarted from the get go. Given how difficult it is for all of us to appropriate these difficult concepts

and practices, the initial resistance by my student teachers greatly decreases the chances that they will gain a level of understanding necessary to put such teaching methods into practice. The likely result is that many student teachers engage in practices that reproduce the existing system without promoting any significant change. Although I remain encouraged and positive at the end of my first year as a professor of education, I grow tired of the incessant but valid resistance of my student teachers to any innovation whatsoever in the face of standards and state mandated tests.

### **VENTURE**

My venture is to begin building social capital (Coleman, 1988) among my colleagues at Crossroads and within my department at CSU Chico by sharing ideas on how we each approach this problem. Perhaps through such conversations, reoccurring themes may emerge that can serve to guide our efforts to help our students overcome the obstacles that stand in the way of innovation in science education. The community would also involve local teachers, as well as student teacher volunteers, that have found ways to include innovation in their pedagogy in spite of the constraints placed upon them by the state and the district. My hope is that such conversations can develop tangible aspects of social capital including trust building, the opening of new channels of information, and the promotion of change for the common good (Dika & Singh, 2002).

Framing the discussion, at least in part, could be Gidden's (1979) notion of structure as both constraining and affording. As evident in my Vexation, we often see structure as constraining, but what does it afford us as well? For instance, what do standards, regardless of how they are written, afford us in terms of how to structure innovation? An excellent example is the backwards design approach of Wiggins and McTighe (2005). Standards play a large role in guiding this process; however, Wiggins and McTighe encourage teachers to deconstruct standards in order to uncover the big ideas and core concepts that can be used to help students make sense of facts and concepts learned. Standards provide a starting place then to create pedagogies that teach for understanding, affording teachers a focus that was not provided prior to the standards movement. The result can be then a more cohesive curriculum resulting in student learning of the big ideas and core concepts of science, as well as the foundational factual and conceptual knowledge that supports such understandings. As the current science standards in California are written in this format, they can easily be utilized and adapted as starting points of innovative curricula and pedagogies.

Likewise, a question that we could ask of standardized assessment is as follows: What do state-wide tests afford us in terms of external assessment data that could complement other forms of internal assessment data to help us better evaluate the effectiveness of our innovations? Again, Wiggins and McTighe encourage us to think about the end first when designing curricula in the form of performance assessments to demonstrate student understanding of intended scientific knowledge. How could teachers then include various forms of assessment, including multiple-choice items, in order to provide a wide range of assessment data to evaluate student learning as well as the effectiveness of our innovations?

The multiple answers to the questions like those posed above would emerge from conversations within the community of educators proposed in this venture. The outcomes could provide teacher educators with the kinds of knowledge and resources to help students move past the current dichotomy of innovative teaching pedagogy in science and the current domination of standards and tests.

Forming such a community and focusing its efforts upon the task at hand will be difficult. As we are all well aware, professors, teachers, and student teachers are very busy people. One option might include a Blog or Wiki in which educators would be invited to write about their approaches to the issue. However, I do not want to rule out the possibility of organized action designed to influence national reform of educational standards currently being proposed by Arne Duncan. I look forward to the innovative ideas from my colleagues at Crossroads to help move my thinking along.