# SCIENCE INSIGHTS

NEWS AND COMMENTARY FROM THE
NATIONAL ASSOCIATION OF SCHOLARS

*Volume 7, Issue 7 ● June 2004*

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### 1. State Standards in Education

From the Editor:

Even after being signed into law on January 8, 2002, the effects of The No Child Left Behind Act continue to be debated with great vigor, and the controversy over the act crosses party and ideological lines. One of the issues this act deals with is that of standards and how to implement them; these questions are rightly of concern to everyone, and in this connection the power of state boards of education in the determination of specific standards and the picking of textbooks has become an issue in many fields, including science.

The following post from the Illinois Council of Teachers of Mathematics (ICTM) concerns one battle on this front in California. Specifically, the question concerns the struggle over a proposal from the California Curriculum Commission that would have allowed no more than 20 to 25 percent of hands-on material in future K-8 science textbooks and would have mandated the adoption of only one textbook to meet those standards. On March 10 this proposal was altered by the California State Board of Education, which instead adopted language stating, "the California Science Standards can be comprehensively taught from the submitted materials with hands-on activities composing at least 20 to 25 percent of the science instructional program."

Because these standards will apply to a state with such a huge population, the results will have repercussions throughout the entire nation: textbook publishers will be reluctant to develop any

books which do not pass muster in such a large market. Simply put, California may be making a choice for the entire nation instead of simply for itself (which is momentous enough).

The question of mandating standards is a difficult one. In the universities, it would never occur to a board to dictate standards, since faculty members are the ones who do that, and in a perfect world the science teachers in the public schools or their departments should be the ones setting standards. However, we do not live in a perfect world, nor are we trying to get there by requiring, for example, that high school teachers have at least a bachelor's degree or equivalent in the subjects they teach. Still, the idea that a state board should mandate specific standards so strictly tends to infantilize teachers and should be rethought.

The other problem is state-level directives mandating uniform adoption of a single textbook. Agreed-upon standards can be taught from a variety of texts, and it is far more important that the teachers be reasonably comfortable with any given books, than it is that a committee be satisfied with what is often a compromise. Further, it is better that a variety of textbooks be adopted so that the experience of their use be compared. A single textbook cannot be judged against others when none is used.

Below is the original post from the ICTM (freely plagiarized by myself in part of the above), along with various links. Of particular interest to the question of textbooks is a letter from a distinguished group of concerned citizens ranging from the chairmen and CEOs of various firms and the heads of various universities in California, including the Chancellor of Berkeley and the President of Stanford, to George Lucas of Star Wars fame. The letter contains the following important paragraph:

"There is an approach that would better serve California's future. If districts were instead permitted to use state funds to purchase curricula from different publishers and then combine and integrate them in ways that, collectively, address all standards for a given grade level, our teachers and students would have access to a wide range of excellent choices. This would make possible a state approval process that is much more inclusive - one in which an individual curriculum unit, rather than a publishers entire program, would be evaluated on its merits for meeting one or more of the standards in the CSS at a particular grade level. Different state-based and regional organizations, with different approaches to instruction, could then generate their own recommendations for what schools should use at each grade level. Each school district could carefully consider these alternatives in selecting what it wants to purchase with State funds."

In this regard, the following paragraph is, along with the quoted paragraph above, most relevant. It was written by Sandra Stotsky in the Book Reviews Section of the current issue of *Academic Questions* (Summer 2003, volume 16, number 3), which occurs in the review of *The Language Police: How Pressure Groups Restrict What Students Learn* by Diane Ravitch.

"Ravitch offers three solutions to combat the language police. First, eliminate the textbook adoption practice in California and Texas, the two states whose guidelines for textbooks influence every publisher in the country. One state is dominated by religious fundamentalists, the other by multiculturists. Let teachers and schools buy whatever textbooks they want, she

suggests, so long as they address their state's academic standards. (However, in its favor, the practice of textbook adoption in California has served to promote sound mathematics and science curriculum materials since its adoption of first-class mathematics and science standards in the mid-1990s.)"

These two paragraphs state a point of view that needs careful consideration. There are some nations with national standards and a national curriculum managed from above, while this nation has always had a hodge-podge of local standards, some more rigorous than others, along with a vast variety of methods to implement those standards. Even on the state level, there is a tradition of letting local school boards have a large say in how to meet standards. The political problem, then, is how to square the circle of insisting on high standards without telling local school boards exactly what they should be or how to implement them. This problem is exacerbated by the insistence of both California and Texas on picking textbooks for all school districts in the state, especially given the danger that decisions of this nature may turn into decisions for the nation.

The conundrum on standards and textbooks is only the latest version of how school districts reconcile the requirements for both wisdom and consent. In the question of textbooks, should a duly constituted body make a choice for all districts, thereby ensuring a result which does not fall below a certain standard, or should it let the proverbial hundred flowers bloom, with the hope that experimentation will be encouraged and hopefully better ways found, understanding that those flowers will be accompanied by some weeds?

The solution will no doubt emerge from the time-tested method of muddling through. Whatever we do, those who insist on emphasizing wisdom have to remember that sometimes wisdom is found in consensual politics, while those who emphasize consent should remember that the truth is not determined by majority vote.

In this case, it seems to me that the two paragraphs quoted above both get it right: allowing a certain amount of local freedom is the most prudent solution, even if it is not a perfect one. Those who would impose what they consider the perfect solution should remember not to make the best the enemy of the good: experience shows that solutions rammed down everyone's throat generally turn out to be mistakes - remember the new math?

I think a reasonable compromise would allow the state to set general standards without micromanaging everything by making the standards too specific or by insisting on picking the specific textbooks to meet those standards.

On the question of textbooks, perhaps local districts could be allowed to choose them with some oversight function reserved to the state in order to make sure this latitude is not abused. In any case, I think state mandated selection of textbooks needs drastic revision: Politburos don't work any better here than they did in the USSR. The ideas set forth in the two paragraphs quoted above seem to me a good place to start.

To read these documents, see below.

ICTM (The Illinois Council of Teachers of Mathematics)

Science Ed. in CA: IMPORTANT DEVELOPMENT

California State Board of Education Votes Against Proposal to Limit Amount of Hands-on Instruction in Future Textbooks

On Wednesday, March 10 the California State Board of Education voted down the textbook adoption criteria language recommended by the state's Curriculum Commission that would have allowed no more than 20 to 25 percent of hands-on material in future K-8 science textbooks. Instead, the state board of education adopted new criteria language that says "the California Science Standards can be comprehensively taught from the submitted materials with hands-on activities composing at least 20 to 25 percent of the science instructional program."

The California Science Teachers Association (CSTA) was instrumental in successfully working with the state education board to change potential textbook adoption language that could have had repercussions for science education nationwide. NSTA and National Academy of Sciences also submitted a letter to the California board outlining their concerns -- See below

(http://science.nsta.org/nstaexpress/lettertocaliffromgerry.htm) -- Dr. Bruce Alberts, President National Academy of Sciences

For more information, go to
http://science.nsta.org/nstaexpress/california_letter.htm -- Dr. Gerald F. Wheeler, Executive Director / NSTA

http://science.nsta.org/nstaexpress/ltr_to_commission.htm -- Sharon Janulaw, President / California Science Teachers Association

See also below --
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March 5, 2004

Mr. Reed Hastings
President
California State Board of Education
1430 N Street, Room 5111
Sacramento, CA 95814

Dear Mr. Hastings:

We write on behalf of the leading institutions of higher education and industries in the State of California to convey our deep concern about the January 16, 2004 Draft Criteria for Evaluating K-8 Science Instructional Materials, and the limits and restrictions they would place on local school districts, schools, and teachers as they strive to improve the teaching and learning of science for all of our students.

The California Curriculum Commission's (CCC) Science Subcommittee has developed Draft Criteria for use in grades K-8, subject to approval by the State Board of Education on March 10, 2004. Currently, the only approved materials for science are textbooks. If the Draft Criteria are approved, with their even tighter constraints, the present "textbook only" situation is almost certain to continue for the next adoption cycle: 2006- 2012.

US businesses and industry seek from today's high school graduates a high capacity for abstract, conceptual thinking, and the ability to apply it to complex, real-world problems. The Draft Criteria would greatly restrict access to nationally produced, widely acclaimed instructional materials for grades K- 8 that promote these skills and habits of mind. While acquisition of knowledge is essential, it is well known that students do not easily acquire scientific knowledge without, at the same time, learning to understand the facts by engaging in active experimentation. Thus, the Draft Criteria are counterproductive to the hope of expanding California's economy, and they will severely limit the opportunities for California's children to learn science and scientific methods.

In addition, all school districts will soon be required to demonstrate increased student achievement, as measured by new high-stakes assessments in science. Despite these new output measures, required by the "No Child Left Behind" federal education act, California would persist in tightly constraining the inputs that each district can purchase with state funds to help students learn. Our poorer districts especially will have no choices other than textbooks, making the present large disparity between them and more affluent districts even greater. Our school districts will be largely forced to use a one-size-fits-all approach to science teaching and learning, known as "direct instruction." This dogmatic approach is reminiscent of the unfortunate State dictate that phonics not be used for the teaching of reading in a previous decade.

The following items in the Draft Criteria are especially problematic, since they would make it impossible to approve any instructional materials other than new textbooks that are custom-written for California.

Item 2 requires that each set of materials submitted by a particular publisher provide for the "comprehensive teaching of all California Science Standards [CSS] at the intended grade level(s)". In addition, "the only standards that may be referenced are the CSS. There should be no reference to national standards or benchmarks."

Item 4 requires that for this set of materials "extraneous lessons or topics that are not directly focused on the [CSS] standards are minimal, certainly composing no more than 10 percent of the science instructional time."

Item 5 requires "evidence demonstrating that the CSS can be comprehensively taught from the submitted materials with hands-on activities composing no more than 20 to 25 percent of science instructional time."

The recognition that the above specifications are completely wrong for California's future requires two important pieces of background information:

1) The production of outstanding, research-based curriculum materials requires 2-4 years of testing and revision; much of this has been supported with funds provided by the National Science Foundation, with the results subsequently licensed to commercial publishers.

Because they have been designed for a national market, these instructional materials are likely to mention national standards, and for the same reason, they are likely to contain more than 10 percent of so-called "extraneous lessons or topics." In addition, as recommended by nearly all of the national science and teaching organizations, hands-on activities will very often compose more than 25 percent of the recommended instructional time. The evidence suggests that students who are able to access such inquiry-based instructional materials as a major component of their science learning demonstrate greater levels of learning and deeper understanding of scientific concepts than students not provided with such opportunities.

2) Many of the nationally recognized, outstanding curriculum materials for grades K-8 are modular, with each unit intended to cover only 1-3 months of instructional time.

It therefore makes no sense to specify that the instructional materials from each publisher must cover all of the CSS at one or more grade levels to be eligible for state adoption. In the previous adoption cycle, the only inquiry based, hands-on elementary science program that was submitted for adoption was not approved, primarily because this publisher did not meet every standard at the specified grade level. Because of the highly restrictive criterion in the new Draft Criteria, none of the outstanding curricula developed nationally could be approved for adoption in California in 2006, either.

There is an approach that would better serve California's future. If districts were instead permitted to use state funds to purchase curricula from different publishers and then combine and integrate them in ways that, collectively, address all standards for a given grade level, our teachers and students would have access to a wide range of excellent choices. This would make possible a state approval process that is much more inclusive - one in which an individual curriculum unit, rather than a publishers entire program, would be evaluated on its merits for meeting one or more of the standards in the CSS at a particular grade level. Different state-based and regional organizations, with different approaches to instruction, could then generate their own recommendations for what schools should use at each grade level. Each school district could carefully consider these alternatives in selecting what it wants to purchase with State funds.

This approach follows the Business Roundtable's Principles for K-12 Education Legislation:

Flexibility: States, localities, and schools should have flexibility for their educational organization, innovation, and instruction while being held accountable for raising student achievement.

Math and Science Excellence: Investments must focus on raising student achievement in math and science by encouraging the use of world-class educational materials and instructional practice.

We urge the Board of Education to develop a new set of criteria that would allow each school district a much broader set of options for purchasing materials (both textbooks and hands-on inquiry-based instructional materials), and request an independent evaluation of the Draft Criteria that includes the rationale and research based evidence upon which they are based.

Sincerely,
Arthur D. Levinson -- CEO, Genentech
Craig R. Barrett -- CEO, Intel
Riley P. Bechtel -- Chairman and CEO, Bechtel Group
Ed Catmull -- President, Pixar
George Lucas -- Chairman and CEO, Lucasfilm; Chairman, The George Lucas Educational Foundation
John E. Warnock -- Co-Founder and Chairman of the Board, Adobe Systems Inc.
Robert Dynes -- President, the University of California
Robert Berdahl -- Chancellor, University of California, Berkeley
J. Michael Bishop -- Chancellor, University of California, San Francisco
Albert Carnesale -- Chancellor, University of California, Los Angeles
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Larry Vanderhoef -- Chancellor, University of California, Davis
Henry Yang -- Chancellor, University of California, Santa Barbara
David Baltimore -- President, California Institute of Technology
John L. Hennessy -- President, Stanford University

* Titles are given only for purposes of identification and do not imply endorsement of the institution.

CC: Governor Arnold Schwarzenegger
Secretary of Education Richard Riordan
State Superintendent of Public Instruction Jack O'Connell
Hon. Jackie Goldberg
Hon. John Vasconcellos
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The postings on the ICTM list express only the ideas and opinions of the person posting them. The Illinois Council of Teachers of Mathematics does not endorse any of the comments or opinions made on this list unless they are explicitly presented by the president (or other designated member) as a statement of its board of directors.

ICTM mailing list
ICTM@lists.mste.uiuc.edu
http://www.mste.uiuc.edu/mailman/listinfo/ictm

## 2. Fingerprints

From the Editor:

This newslist is dedicated to strengthening the claim of science to represent the truth, rather than the "truth," which is to say that we reject the notion that modern science is merely one more weapon in the hands of the powerful with which to perpetuate the evils of dead white homophobic European males against the powerless, etc., etc.

It seems that the greatest enemies of science in this fight can sometimes come from its supporters. The following article on fingerprint evidence is a good example of this, as well as being truly frightening in its legal and other implications. Click on http://www.newscientist.com/news/news.jsp?id=ns99994611 to read further.

## 3. Indoctrination at Indiana University

From the Editor:

The following article is, if accurate, one of the worst examples of the misuse of scientific credentials I have ever seen. Apparently an entire course in "Threats, Violence & Work Safety" has been hijacked in order for the teacher to subject her students to her views on the Middle East. Read it by clicking on http://www.frontpagemag.com/Articles/ReadArticle.asp?ID=11924.

## 4. Tuskegee Experiments

From the Editor:

Most reasonably well-informed laymen are aware of the Tuskegee Study, which was a study of Southern black men with untreated syphilis lasting from 1932 until 1972. When the story hit the newspapers in 1972 it created a scandal. The gist of the controversy was that the medical profession had allowed its scientific curiosity to interfere with the treatment of patients by measuring the results of syphilis without treating it; and since the patients were all Southern

black men, and white men dominated the medical profession, the obvious question of racism made the affair still worse.

Richard A Shweder is a cultural anthropologist, Carnegie Scholar, and the William Claude Reavis Distinguished Service Professor in the Committee on Human Development at the University of Chicago. He has written an article entitled "Tuskegee Re-examined" in which he draws no definitive conclusions about the experiment, but does make arguments that show another possible and totally contrary conclusion from the one that has become accepted wisdom.

I was in academic life for thirty-four years, and the last sixteen of them were spent as the grievance chairman of The Cook County College Teachers Union. In that job, I often listened to the complaints of faculty members and others in the various job classifications we represented - janitors, secretaries, security personnel, and various categories of professionals. More often than I like to admit, I would charge into a grievance meeting filled with righteous indignation, only to hear the other side of the argument and watch my own position go up in flames (this happened to the other side as well). One would think that after a while I would learn never to come to a conclusion without hearing both sides, but it is amazing how difficult that can often be.
This article should be must reading for everyone who read about the Tuskegee experiments and concluded along with the reporter that this was another particularly egregious example of our unfortunate racial heritage and the tragedies lying in its wake, not to mention the prostitution of science for use against the powerless. To read another view, and one which is superbly and dispassionately stated, copy and paste the following link: http://www.spiked–online.com/Printable/0000000CA34A.htm.

## 5. Latest Update on Kennewick Man

From the Editor:

Volume 7, Number 1, of *Science Insights* included an article on Kennewick Man written by Glynn Custred, an anthropology professor at California State University at Hayward as well as the co-author (with Thomas Wood) of the famous Proposition 209, which outlawed the use of race preferences in public institutions in the State of California. I strongly recommend that anyone not familiar with this article log on to www.nas.org, scroll down to Publications, click on it, then click on *Science Insights*, and finally click on volume 7, number 1.

The latest chapter in the Kennewick Man story was written this February, 2004, by a three-judge panel of the Ninth Circuit Court of Appeals, which upheld a lower District Court's ruling that allowed scientists to study the 9200-year-old bones of Kennewick Man despite the attempts of Indian tribes to deny them that right. Four Indian tribes then asked the full Ninth Court to hear the case, but that request has just been denied this month (April, 2004).

To read a news article on this latest triumph of science over politics, click here (Seattle Times, http://seattletimes.nwsource.com/html/localnews/2001850585_webkennewick04.html) or here (newscientist.com, http://www.newscientist.com/news/news.jsp?id=ns99994666) for the panel's ruling.

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*Science Insights* is a free, on-line publication edited by John Wenger, Ph.D., and released periodically by the National Association of Scholars. The views and opinions expressed in *Science Insights* are not necessarily those of its editor or of the National Association of Scholars. Our goal is to keep the scientific community informed about developments -- both positive and worrisome -- affecting research and teaching in the life, physical, and social sciences. Previous issues can be accessed HERE.

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