



The **BEACON**

News from

The Coalition for Excellence in Science and Math Education

Volume VIII, No 3

Copyright © September 2004

IN THIS ISSUE: President's Report—Dr. Marshall Berman, **Who Learns the Most?**—Walt Murfin, **NCLB—Most Children and Schools Left Behind**—Marshall Berman, **Cartoon**—Dave Thomas, **The Lumbar Spine (Lyrics)**—Dr. Stephen Baird

President's Message

The CESE Annual Meeting was extremely successful. I outlined our recent achievements and plans for the future. The talk by Secretary of Education, Dr. Veronica Garcia, was superb. She discussed the Public Education Department activities, and plans for the future. Please check our website, www.cesame-nm.org, for detailed minutes of the meeting. Below are the highlights of my talk at the meeting.

Recent Activities

CESE has had an amazing year in 2003-2004. The year began with Dr. Art Edwards as president, and many challenges in all aspects of education in New Mexico. Art served with distinction until December, when his work responsibilities forced him to resign, and I, as president elect, was chosen to take his place.

Special election on constitutional amendments

CESE took a position opposing Constitutional Amendment 1 that would remove policy-making authority from the State Board of Education, and create the position of Secretary of Education. Our stand was based on data showing no long-term benefit of such a governance change, and the possibility of short-term instability. However, we stated publicly that we

would continue our mission in support of public school education, regardless of outcome. And we have.

Revised Science Standards

CESE was created eight years ago as a result of our concerns with the changes made in the science standards by a small number of State Board members at that time. Although CESE's mission now encompasses all aspects of education improvement, this issue has continued to be very important. Last year, the CESE Board and many of our members devoted an enormous effort to participating on the writing committee, evaluating the various versions of the new standards, suggesting revisions, and soliciting support from many science, religious, business and teachers organizations throughout the state and the nation. We also attended the State Board meetings in large numbers, and were ultimately successful when the new standards were adopted unanimously by the State Board on August 28, 2003. And of course, these high-quality standards could not have been produced without the hard work, perseverance and dedication of Education Department staff, especially Dr. Steven Sanchez and Sharon Dogruel.

A full accounting of the history of the standards from 1996 until today has been published in the "Reports of the National Center

Continued on page 2

The BEACON is published by the Coalition for Excellence in Science and Math Education (CESE). A 501(c)3 nonprofit corporation, CESE is incorporated in the State of New Mexico. Visit the CESE web site.

WWW.CESAME-NM.ORG
Dr. David Johnson Web Master

**BOARD OF DIRECTORS
PRESIDENT**

Dr. Marshall Berman
(505) 296-5640
mberman60@earthlink.net

VICE PRESIDENT/PRES. ELECT
(Vacant)

SECRETARY

Marilyn Savitt-Kring
(505) 856-6654
mmkring@juno.com

TREASURER

Jerry Shelton
(505) 296-1467
jshelton101@comcast.net

PAST PRESIDENT

Bill MacPherson
(505) 856-6241
wmacpherson3@comcast.net

MEMBERS AT LARGE

Steve Brugge
(505) 271-9273 (H)
(505) 292-2350 (W)
brugge@aps.edu

M. Kim Johnson
(505) 897-3364 (H)
(505) 247-9660 (W)
kimber@comcast.net

Dr. Timothy Moy
(505) 254-8991
(505) 277-7851
tdmoy@unm.edu

Dr. Matt Nyman
(505) 266-5984
mwnyman@unm.edu

David E. Thomas
(505) 869-9250 (H)
(505) 247-9660 (W)
nmsrdave@swcp.com

CESE annual dues are \$25 for individual, \$35 for family, and \$10 for students. Please make checks payable to CESE and mail to 11617 Snowheights Blvd. NE Albuquerque NM 87112-3157

Email submissions (subject to edit) to
Editor, Nancy Shelton
nshelton10@comcast.net

Continued from page 1

for Science Education, Volume 23, Numbers 5-6, Sep-Dec 2003, pp. 9-12." (Also on the CESE website. An article by Board Member Dave Thomas appeared in the July 15 special issue on education in *Crosswinds Weekly*.)

Helping classroom teachers to teach the new standards

New Mexico's new science standards are now among the very best in the nation. But it won't be easy to convert these standards into improved classroom instruction and student achievement. In addition, the Intelligent Design creationist movement continues to misrepresent the standards as supporting their views, when they clearly do not. To assist teachers, CESE and New Mexicans for Science and Reason joined forces to conduct a teachers' workshop. See our website for more information.

The Intelligent Design people also conducted their own workshop, falsely arguing that the new science standards support "teaching the controversy," where they have defined that controversy in their own terms.

Data Analysis and Interpretation

CESE statistician Walt Murfin and other members have been analyzing TerraNova and NAEP data over the last 5 years. This analysis is helping us understand our relatively low test scores, and look for ways to reduce the achievement gap that are based on solid data.

NCLB

NCLB is a well-intentioned federal law whose goal is an equal quality education for all Americans. Unfortunately, there are aspects of the law that may cause much more harm than good. We are studying the ramifications and potential consequences of this law, and we are very concerned. We will continue to do what we can to bring data and analysis to this issue, and to assist politicians and administrators in making beneficial data-based decisions. An NCLB critique by me appeared in the July 15th issue on education in *Crosswinds Weekly*. (See page 6.)

CESE takes quick action

Last year, CESE contacted KNME to inform them about the source, content and intention of the Intelligent Design videotape called "Unlocking the Mysteries of Life." KNME pulled the tape. However, the ID community continued to exert pressure and the TV station reconsidered and planned to air the tape in August of this year. Again we responded with letters and phone calls and eventually persuaded the station to pull the tape once more. This episode is strong evidence of the need for CESE to continue its mission indefinitely. The Intelligent Design Creationists continue to misrepresent their so-called "scientific evidence" against evolution. They wish to subvert the overwhelming scientific support for biological evolution into political and religious issues of "fairness," equal treatment, free speech, and "teaching the controversy." We must be vigilant and equally persistent.

Beacon

Our newsletter, The Beacon, under the leadership of its editor, Nancy Shelton, has been expanded and now includes regular articles on data analysis and interpretation, book reviews, education updates, and other articles on education in general, including science and math.

Website

The CESE website, www.cesame-nm.org, under the leadership of Prof. David Johnson, continues to grow. In addition to informing readers about important science and math education in New Mexico, it also provides a calendar of events, and links to other valuable and pertinent websites.

Future Plans

Data-Based Decision Making

We will continue our current efforts in promoting data-based decision making, and employing Baldrige Quality principles from the Public Education Department down to the classrooms.

Teachers Workshops

CESE plans to hold additional workshops for science teachers, perhaps in concert with APS.

Community Involvement

We are also becoming more involved with community and business organizations that share our goal of reducing the achievement gap among various groups in New Mexico.

Charter Schools

We may get involved in a new charter high school that focuses on bringing dropouts back to school to get a diploma instead of a GED. The school will also work closely with the business community to find employment for students during school as well as after they graduate. We are also discussing whether to increase our involvement in the Albuquerque MAST charter high school.

Supporting Successful Programs

CESE is supporting two education programs that have been extremely successful: **SQS** (Strengthening Quality in Schools) brings a Baldrige-based quality approach to all aspects of education. The **DAY** Foundation, having served about 3000 students to date in 18 schools, has already raised most reading and math scores one to two grade levels at a cost of only \$200 per student.

National Involvement

We are also planning to increase our involvement on the national level, perhaps through an organization we helped form called **CASE**: Citizens for the Advancement of Science Education.

Your input, suggestions, and help are extremely welcome. We have an enormous task before us to help improve education for all students, to close the achievement gap, and to help develop a scientifically, numerically, and socially literate population to maintain our democracy and our standard of living.

Marshall Berman
CESE President

Who Learns the Most?

We know that on average, minority and poor children tend to get lower scores on standardized tests than affluent Anglo children. Does that mean they are not learning well, or that they are being taught inadequately? Perhaps the snapshot of one year's scores does not tell the whole story. We need to look at annual gains – how much children gain from third grade in one year to fourth grade the next year, and so forth. That really tells us how much they're learning, regardless of where they started. Figure 1 shows statewide gains. The numbers on the horizontal axis represent the grade in 2002. The plotted points show the gain in score from the next lower grade in 2001.

(See Figure 1.)

You see that Hispanic students consistently gain a tad more than Anglo students. How can that be, if Hispanic students typically get lower scores than Anglos? Think about it; it's fairly easy to go from the 30th to the 40th percentile, very difficult to go from the 70th to the 80th, and almost impossible to go from the 90th to the 99th. For example, Dulce went from the 17th percentile in 1998 to the 34th percentile in 2001 – apparently a huge gain, while Los Alamos went from the 79th percentile to the 82nd – an apparently small gain. Dulce had lots of room to grow and Los Alamos had very little. It isn't that Hispanic students are more capable than Anglos. Hispanic students start at a lower level, so have more room to advance. Figure 2 shows that when annual gains are adjusted for demographics (race, poverty, mobility), the annual gains are lower for high starting scores. You see that there are many exceptions. Why? Well some schools and teachers are better than others. When everything else is accounted for, what else is left? (See Figure 2.)

Unfortunately, Native American students do not fare so well. The average annual gains of Indian students are typically no higher than those of Anglos, and for some grades are actually lower. Indian students are not being adequately helped to come up to parity with

Anglos. They start far behind and actually get farther behind as they go through school. We don't know whether predominantly Indian schools have more problems or whether the early family life of Indian children does not prepare them well for a learning environment. Maybe both are true. However, the relation between initial scores and gains is still evident. Indian students with lower initial scores do make greater gains than Indian students with higher initial scores. Indian students in largely urban districts make greater gains than Indian students in largely reservation districts.

Annual gains in APS schools show the same behavior. Groups that consistently get lower scores just as consistently make greater gains. That is especially true of special education students. They start very far behind non-special education counterparts and tend to make much larger gains. (See Figure 3.)

So why don't disadvantaged students catch up and eventually surpass affluent Anglos? There are two reasons. First, their starting point is far behind, and their advantage in annual gain is quite modest in comparison. Also, those who do catch up run into the same wall as the best Anglo students. Once you have achieved a higher level, it is hard to continue advancing at the same rate.

The bottom line for Hispanic students is that the schools are really not doing a bad job. They are learning as well as Anglos, even a bit better. Unfortunately, they start well behind their Anglo counterparts. Although Hispanic children make very adequate gains from year to year, their initial disadvantage stays with them. That is not the fault of the schools. The answer almost certainly lies in the home and the community. On the other hand, Indian students, especially those in nearly all-Indian schools, are not advancing at an adequate rate. Both schools and families might be at fault. The data we have are not adequate to tell us.

WALT MURFIN
CESE STATISTICIAN

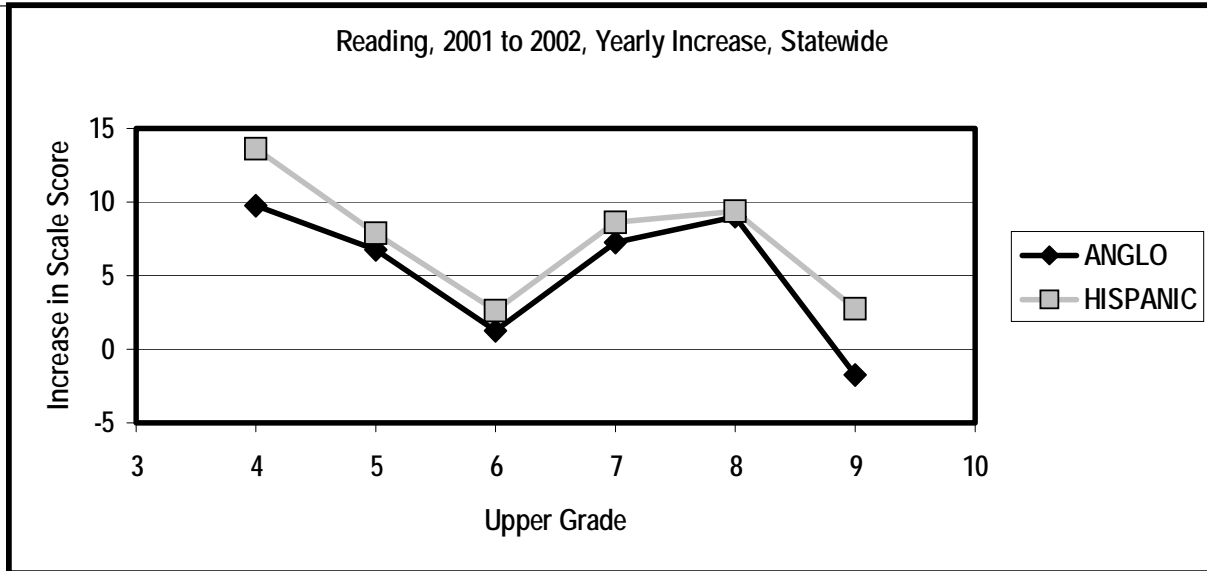


Figure 1. Annual Statewide Reading Gains.

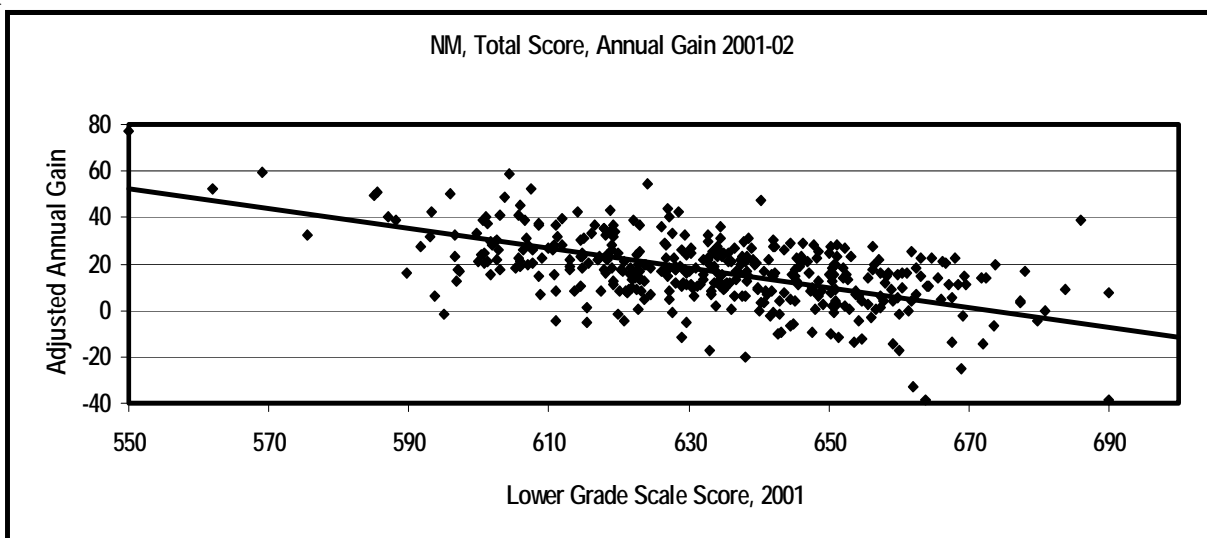


Figure 2. Adjusted Annual Gain vs. Initial Score.

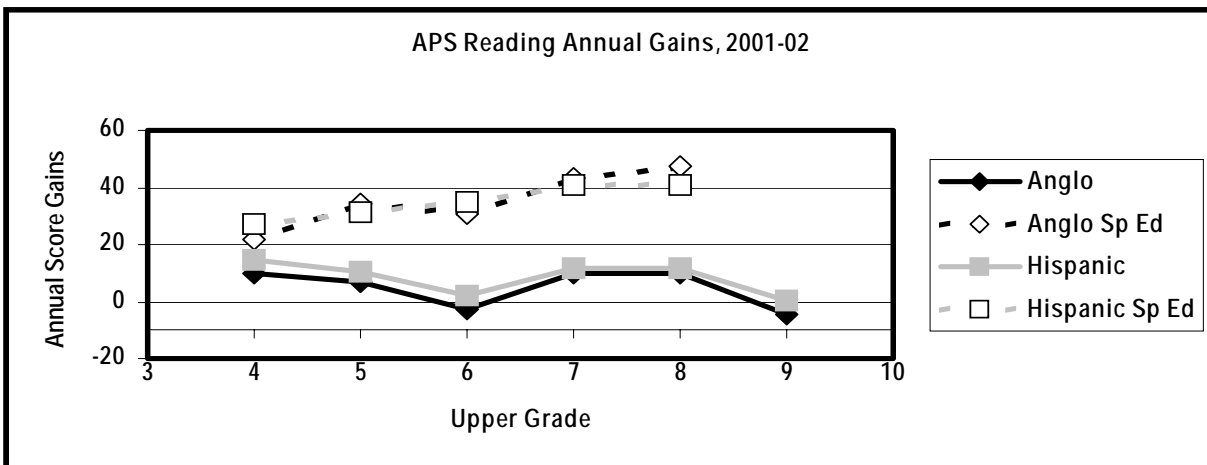


Figure 3. Average Annual Gains in APS.

NCLB—Most Children and Schools Left Behind

Dr. Marshall Berman

June 24, 2004

Allow me to relate a fable for our time: Imagine that the US Congress has decided that this nation faces a crisis in physical education. Obesity, diabetes, and just plain sloth are pandemic. The problem clearly begins in the public schools. So Congress has overwhelmingly passed the NCLB-2 law by a bipartisan majority of 87 to 10 in the Senate and 381 to 41 in the House. The president, to much fanfare, has signed the law into effect. A summary of the law's 1000 pages follows:

Mission of NCLB-2 Physical Education Achievement

In order to address the enormous health problems faced by Americans, and to redress the group inequities in physical achievement, this law will ensure that students reach adulthood physically fit, trim, and prepared to lead healthy and productive lives. Our goal is to set very high standards and ensure that they are met by all students.

Accountability

In the first year, this law will apply to all students in grades 4, 8 and 11. In subsequent years, all students in grades 3 through 8, and 11 will be subject to the following assessments: Every state will test students in the high jump. They will set the initial bar height as high as "reasonable." States

that set the bar too low will be yelled at.

In the first year, students will be required to jump the bar. The fraction that cannot clear the bar will be deemed "below proficient." The schools must then achieve Adequate Yearly Progress (AYP) in their goal of reaching 100% proficiency by the year 2014 (ten years hence). For example, if 40% of the students cannot clear the bar, then the school must increase "proficiency" by 4% per year until reaching 100%. Those students that can clear the bar already will have no effect on AYP. They will be mostly ignored for the rest of their public school career.

Schools must disaggregate (separate) students according to the following groups: obese, excessively skinny, lung challenged (e.g., asthmatics), disabled (paraplegics, blind, etc.; quadriplegics will be excused from testing), and poor. Physically-challenged (special ed) students may be provided accommodations; e.g., ramps can be used for wheel-chair bound students. 95% of all students must be tested each year.

If a school does not achieve AYP in two years for all groups, an accelerating set of sanctions will be applied. Students can switch to other schools with better coaches and facilities.

All coaches must be highly qualified, which means having degrees in physical education.

In the second year, for a broader measure of physical education, assessments in short (100 meters) and long (6000 meters) races will begin in the same fashion. Minimum race speeds will be determined by the state and all students will achieve or surpass this minimum by 2014.

Schools that continue to fail AYP will be subject to ever more severe sanctions, until ultimately the school is taken over, closed, or all federal funding is eliminated.

Complaints by basketball, football, baseball and other coaches will be ignored. Students must master the basics before they take on more complex tasks like team sports.

Does this sound ridiculous to you? Of course. Even so, every part of this analogy applies to the current NCLB law (<http://www.ed.gov/nclb/landing.jhtml>), except for the replacement of the words "Physical Education Achievement" with "Academic Achievement" and "bar height" with "minimum passing test score (proficiency)." "Team sports" is a parody for other subjects like history, government, economics, literature, ethics, etc.

It is clear that AYP and 100% proficiency will NOT be achieved by the 2014 deadline, or for that matter, ANY deadline. So it is certain that the vast majority of schools in the nation are destined to fail. A recent *Forbes* article says:

(<http://www.forbes.com/business/forbes/2004/0315/086.html>): “[NCLB] states, insensibly, that by 2014 *all* American students must be “proficient” in reading and math. Any school at which this doesn’t happen will suffer severe penalties, up to and including a takeover by the state. Yet the shape of the bell curve guarantees that most schools will fail. No amount of accountability, incentives and superduper teaching can possibly get all the kids in any sizable school up to 100% proficiency by 2014....”

Furthermore, since NCLB requires Criterion Referenced Tests (CRTs) and a simple pass/fail system of proficient or not proficient, a tiny fraction, or even a single non-proficient student in any subgroup can cause an entire school to “fail.” Similarly, since high standards and the number of students attaining proficiency are inversely proportional to each other (if one goes up, the other goes down), the current NCLB requirements will encourage states to lower their standards in order to increase the number of students who can become proficient (and many have already done that:

<http://query.nytimes.com/gst/abstract.html?res=F60613F93A5A0C728FDDAB0994DB404482> *How to Measure Student Proficiency? States Disagree on Setting Standards and Tests*). Hence, NCLB contains internal contradictions between high standards, accountability and closing the

achievement gap. It is likely to increase cheating. The system will also reduce efforts to support proficient and more advanced students, because those higher achieving students have no impact at all on AYP. These aspects of the law must be changed to a reasonable system that recognizes the normal individual (not group) variations in student ability. As currently written and implemented, NCLB is likely to do much more harm than good.

Like so many efforts to “reform” education, NCLB was well intentioned. Its worthy goals were to introduce strong accountability measures, raise standards, and close the achievement gaps between whites and Asians on one hand, and Blacks, Hispanics and Indians on the other. But it totally confuses equal opportunities with equal outcomes. Reducing the achievement gap means that it should no longer be possible to see gaps between different *groups*. But it will always be possible to see *individual* variations among people. The achievement of students should depend exclusively on their ability, motivation, hard work, and equal high-quality education opportunities—and not on which group they belong to.

When the obvious statements in this article are discussed with NCLB believers, their responses are often similar to “we want all children to be able to read and write.” This is a

desirable qualitative goal, but NCLB requires concrete measurements using CRTs. A CRT in NCLB is a simple pass/fail assessment defined by a certain number of correct answers on a test. Getting fewer answers than a specified number means the test-taker is NOT proficient. On the other hand, a Norm Referenced Test (NRT) compares student performance against the average performance of a national sample. Any test can be treated as both an NRT and a CRT. The huge gaps among various groups (by race, ethnicity, poverty, or English proficiency) were determined long before NCLB, and we should continue to provide such measurements in a more realistic way than the simple minimum-standard, pass/fail concepts of NCLB-promoted CRTs.

Rep. John Boehner (R-OH) and Sen. Ted Kennedy (D-MA) were key players in NCLB development. In Sep. 2003, Rep. Boehner’s view was discussed in the Washington Post:

<http://www.washingtonpost.com/ac2/wp-dyn?pagename=article&contentId=A15836-2003Sep15¬Found=true>

“Assume for a moment that Congress had decided instead to set a goal of 95 percent of all students being proficient in reading and math, said Rep. John A. Boehner (R-Ohio), chairman of the House Education and Workforce Committee. “Okay, so let’s throw 5 percent of the kids overboard,”

Continued on page 8

Continued from page 7

he said. "It wouldn't be my kid or your kid, but it will be somebody's child. Don't they count?"

This statement represents an extreme confusion of goals and outcomes, and the real danger of using an impossible name for a law such as "No Child Left Behind."

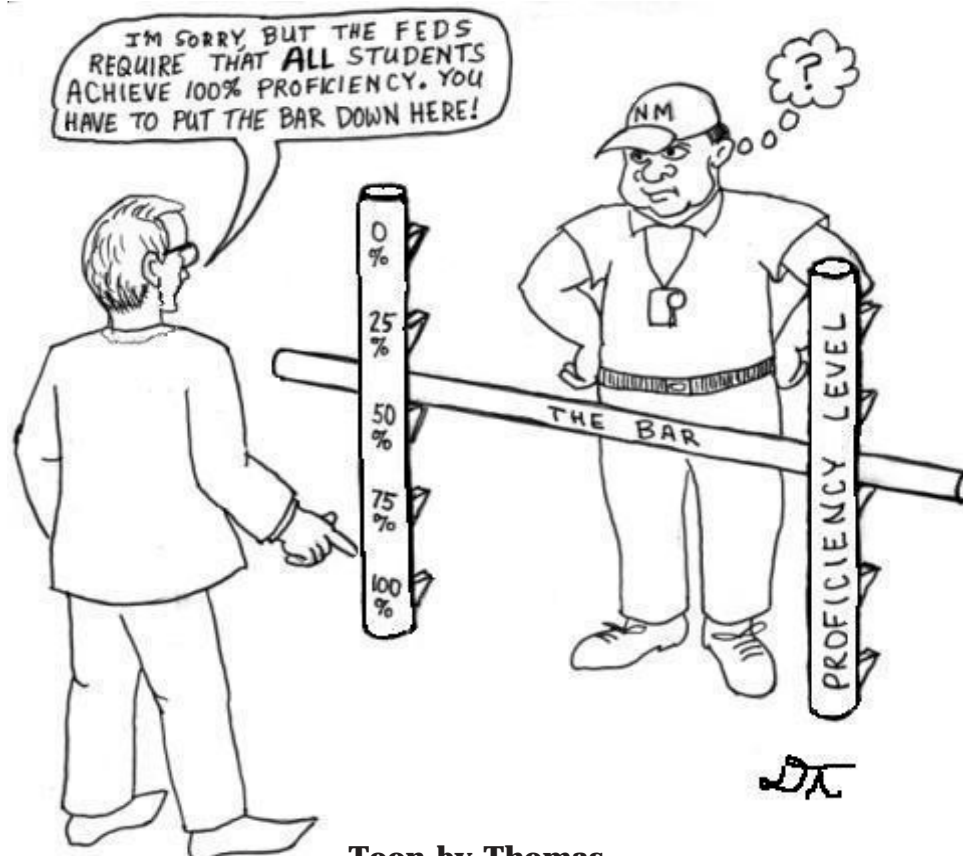
(see <http://www.enc.org/focus/assessment/document.shtm?input=FOC-001554-index> "Welcome to Lake Wobegon, where the women are strong, the men are good looking, and all the children are above average." Garrison Keillor.)

No single percentage, not 100% nor 80% nor any number, is appropriate; rather, we should use quantitative measures of the means and standard deviations in group achievement levels, apply efforts to reduce them, and then make comparisons against the higher group achievers (like Whites and Asians). Ultimately we want

to benchmark our students against the student achievement levels in other countries to keep American education competitive and world-class [e.g., TIMSS in science and math (<http://nces.ed.gov/timss/>) or PIRLS in literacy (http://isc.bc.edu/pirls2001i/PIRLS2001_news.html)]. The only **numerical** goal should be that differences due to variations other than individual ability (such as race, ethnicity, school and teacher quality, poverty, etc.) should no longer be statistically significant.

Most school districts across the country are complaining about insufficient funding for NCLB. This is like complaining about a stain on a carpet in the midst of a Richter 9 earthquake. It's time for states across the country to demand that the NCLB law be changed immediately to incorporate reasonable accountability requirements, time scales and goals.

MARSHALL BERMAN
CESE PRESIDENT



Toon by Thomas

<http://www.cesame-nm.org>

2004 Membership Form
Coalition for Excellence in Science and Math Education (CESE)
501 C (3) non-profit, tax deductible

Member \$25**Family \$35****(Expiration date is shown on address label)****Student \$10****New Membership []****Renewal []****Donation []****Name** _____ **Date** _____**Profession and/or affiliation(s)**

e.g. "Science teacher, member of ASCD"

Mailing Address _____**Phone** _____ **Fax** _____**E-mail** _____**(Most of our communication is by e-mail.)**

The Lumbar Spine

To whom do you think I should whine? To Darwin or to God?
 Because the human spine appears so clearly flawed.
 To rise up to our upward stance created a lordotic curve.
 So if we're lifting or twisting or dancing, there's danger we might pinch a nerve.

Chorus

Is lordosis from the Lord or all the options chance explored?
 If you're extolling our design, what about the lumbar spine?

For creatures crawling on the ground, a straight spine will suffice.
 And in the trees, to hang around, a straight spine's just as nice.
 But when we rise to stand erect, the curvature that was required,
 Compressed our lumbar discs at awkward angles, which leaves a lot to be desired.

Was it intelligent design or Darwin's randomness,
 That left the human lumbar spine such an ungodly mess?
 It's blasphemy to criticize the creator's adequacy,
 But if our low back were his thesis project, would you give him his Ph.D.?

Reprinted with permission from Stephen M. Baird, M.D.
 © 2003 Scientific Gospel Productions, LLC (858) 481-0765
<http://www.scientificgospel.com>

Coalition for Excellence in Science and Math Education
11617 Snowheights Blvd. NE
Albuquerque, NM 87112-3157



Return Service Requested

Thank You

Contributions, in addition to dues, were received recently from the following members. (Total contributions were \$245.) Some people simply add a little, or a lot, when paying dues, and others write an extra check. All are gratefully welcomed!

Olin & Jan Bray
Andrew Heckert and Kristan Cockerill
Robert E. Vardeman
Anonymous

Marilyn Savitt-Kring and Steve Brugge
supplied food and drinks for the annual
meeting.

Note

If your e-mail address changes, please tell Marilyn at mmkring@juno.com.