Science & Math CESE Education

The BEACON

News from The Coalition for Excellence in Science and Math Education

Volume XX, No. 2 Queries? email Rebecca Reiss (next page)

PRESIDENT'S MESSAGE, Jesse Johnson

You may recall that in the last Beacon, one of our members, Lisa Dirkin, wrote an article detailing her ordeal with the teacher evaluation system. In that article, *How New Mexico's Teacher Evaluation System Translates to the Classroom*, she discussed the production of 710 pages of documentation required to move up from an Effective rating to an Exemplary rating. If producing this documentation is what it took to raise her rating, that tells us that part of the teacher evaluation system is measuring how well teachers can jump through bureaucratic hoops. With 710 pages, I would argue that makes paperwork production a significant part of the evaluation, at least in terms of time expended by the teacher. This is time that is not spent teaching.

When we look at what we are measuring in our teacher evaluations, we are skipping over very important question: What should we be measuring? A teacher's ability to produce massive amounts of documentation is not the answer. We need to know what we, as a society, expect out of the school system. I have yet to see a logical, coherent set of expectations on this topic that most people can agree on, but I do see a lot of emphasis placed on evaluation. But where are the clearly articulated standards? You can point to the standards promulgated by the state for specific subject areas and say that these are the expectations for teachers and to some degree this is true, but this misses the point. You can also say "I want students to be well rounded and ready to enter college," but that is rather vague and we need to decide what 'well rounded' actually means. The idea that every student should be prepped for college at the end of their high school careers may not make sense, considering that around two thirds of them will not go on to get a bachelor's degree. What about the non-college bound students? Is it possible to define what "well rounded" means and determine that it is realistic? Can we agree upon outcomes that are applied to all students, whether they are ready to go to college or not? In short, what is the end goal of the public education system?

I am asking for an answer to a deeper philosophical question than just the wording of math and science standards and I think an earnest discussion regarding this needs to take place. What do we want for our students at the end of their public education? It is a seemingly simple question that is difficult to answer, and I do not believe that we have answered it. If we cannot answer the question of what the end game is, how can we expect to realistically evaluate our teachers, students and schools? Test scores alone do not account the effects of demographics, and leads good teachers in schools populated by impoverished minorities getting poor evaluations. Measuring 'growth' will lead to good teachers in affluent schools hitting a wall and getting poor evaluations. Requiring 710 pages of documentation will lead to teachers becoming good bureaucrats, but does not contribute to the quality of education that they provide.

If we cannot answer this basic question of what our students should get out of the school system, then we have lost our way.

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EDITOR'S MESSAGE, Dr. Rebecca Reiss

The recent controversy over NM science standards consumed much of our time this fall; although we are vindicated by the outcome, there are many other issues involving the PED that need to be resolved. For example, according to an interview she gave in November of this year, the former New Mexico Secretary of Education Hannah Skandera, is most proud of how she raised student performance on tests during her tenure. Does the data support her assertion? Stay tuned for the answer in the next Beacon.

I'm pleased to unveil a column "Notes From The Trenches," devoted to the view of teachers on the frontlines of public education.

Next-Generation Science Standards Versus New Mexico STEM Ready Standards: The Whole Story?

The NM Public Education Department's (PED) website includes the motto "Kids First New Mexico Wins!" But the recent debacle over the PED's attempt to adopt science standards that removed scientific issues such as climate change, the age of the earth, and evolution from the Next-Generation Science Standards (NGSS) proves that they are putting the opinions of a select few constituents first. Although the recent uproar over the unscientific changes to the modified NGSS that the PED called "NM STEM-Ready Science Standards" resulted in PED's adoption of NGSS in its entirety, questions remain regarding the attempted politicization of educational standards.

NM Science Standards: A History

In 1996, the State Board of Education (SBOE) adopted a set of science standards stripped of those items that would upset creationists such as age of the earth and evolution. This event resulted in the founding of the New Mexico Coalition for Excellence in Science and Math Education (CESE) and the establishment of the Beacon Newsletter. Through the efforts of the late Marshall Berman, the still alive-and-kicking M. Kim Johnson, and many others, the State Board of Education (SBOE) stripped the creationist language from the standards. Science standards come up for review every seven years, so in 2003 CESE and others joined forces to ensure that NM Science standards weren't diluted by non-scientific language. As a result, the current standards (2003) were adopted. We have been vigilant ever since and now keep a watch over the events that impact public education in New Mexico, including standard changes, teacher evaluation

practices, and school grading. Another important event occurred in 2003; a constitutional amendment was passed that replaced the SBOE with a Secretary of Education in charge of the PED. This put the governor in charge of the public education by the appointment of the Secretary of Education (which requires confirmation by the Senate). With this change, the Secretary can implement rules unilaterally, only requiring a 30-day public comment period and a public hearing, where input is recorded and to which the PED responds. This has led to a less-than transparent process for changes.

In 2010, the 2003 standards were re-adopted. The 2017 review of the science standards focused on the adoption of NGSS, which are the result of several years of work by educators and scientists to develop national standards to prepare students for science and engineering careers as well as to educate all students with a good science foundation. Despite efforts by the PED to significantly change these standards, overwhelming public input has driven a recent decision to adopt the full NGSS with its Framework, plus the addition of six New Mexico-specific standards that will be incorporated into that framework.

The Next Generation Science Standards: A History

The national effort to establish science standards effort can also be traced back to the 1990s, when the National Science Foundation (NSF) Committee on Equal Opportunities in Science and Engineering (CEOSE) gathered information on efforts to promote science careers to underrepresented groups. Their 2004 report to congress[1] summarized efforts from 1994 to 2003 and included this statement on efforts made during this time:

> Teacher professional development, standards and frameworks for teaching mathematics and science, and programs to motivate young children by making science and mathematics more inviting were parts of the multi-faceted response to the problem of early attrition from STEM education. (pg. 83)

In 2007, the Carnegie Corporation of New York's Institute for Advanced Study Commission on Mathematics and Science Education was formed to study issues of science education in the U.S. One of the four recommendations in their 2009 report[2] is the establishment of "common standards in math and science that are fewer, clearer, and higher, coupled with aligned assessments." (pg. vii)

A committee of educators and scientists was formed in 2010 by the National Research Council (NRC) to identify effective science, technology, engineering and math (STEM) teaching practices and these were published as *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas in 2011*[3]. Finally, in 2013, the NGSS were published by the NRC, followed by publications outlining the development of assessments for the NGSS in 2014, and a guide for implementation in 2015. All of these (and other) peer-reviewed documents are available as free downloads from the National Academy of Sciences (NAS) under the heading *Next Generation Science Standards Collection*[4]. This history demonstrates that there is no need for PED to reinvent the wheel; it has already been invented, tested, and successfully implemented in 18 states, by the District of Columbia, and by numerous private educational institutions.

PED'S "NM STEM-Ready Science Standards"

On September 12, 2017 the PED announced a public meeting regarding the rule change for the NM science standards that they called the "NM STEM-Ready Science Standards." Although the PED initially would not acknowledge the connection to NGSS, the rule change involved replacing the current standards with modified NGSS performance expectations; although the announcement included the statement that "No technical information served as a basis for this proposed rule change." The modifications eliminated one performance expectation relating to evolution, changing the terms evolution to biodiversity and climate change to temperature fluctuation, and the elimination of the age of the earth upon which geologists agree. There were additional 'standards' (a.k.a. performance expectations) proposed for NM students, but these were not written

in the same format as the NGSS performance expectations, and appeared as if they were suggestions for lesson plans; poorly written ones at that. Nor did any of the proposed new "standards" fit into the very necessary NGSS framework that allows the NGSS standards to flow and link across multiple disciplines with common, core science principles. This crosslinking to all science disciplines and even to disciplines outside of science is what makes the NGSS an effective teaching resource.

The response to the rule change was swift and decisive: the changes are unscientific and will be a disaster for NM students and teachers. The issue generated national attention and through the efforts of Glenn Branch from the National Center for Science Education (NCSE), the controversy was published in the New York Times[5], Newsweek[6], and Mother Jones[7].

October 16, 2017: The Showdown

The October 16th public hearing was over-crowded; the PED selected a venue that was far too small. There were over 200 people signed up to speak, but only 94 had the opportunity. A fire alarm that was activated by an unknown party interrupted the hearing and the scheduled noon-end time was extended to 4 pm. Everyone who spoke was against the changes, and essentially all were for the adoption of the NGSS without modification and superfluous additions.

The PED leadership most certainly expected to have little attention paid to this meeting, since little public notice of its scheduling was given, other than a small, innocuous notice on its rule-making website. But once the media fell on it and the word spread, many, many questions were asked both before the meeting and during. These questions centered around why the PED was making the unnecessary and harmful changes, especially after its own highly qualified advisory group, the Math and Science Advisory Council (MSAC), had studied these standards for some time and strongly recommended their adoption. This was after the New Mexico Academy of Science, CESE, business organizations, and academic institutions, had written multiple letters recommending that the full NGSS be adopted. Over a period of about two years scientists and science organizations had been formally recommending the adoption. Interestingly, the Secretary-designate of Education stated to the press that people should have spoken up sooner when the uproar over his changes became so loud that it could not be ignored. We had spoken up many times. It seems no one listened, or if they did, they thought that we would just go away. Apparently there were other, unamed advocates whose opinions mattered more to the PED leadership.

Who were these people who had suggested these rather egregious changes? When asked that question, the Secretary-designate had answers ranging from districts around the state to a promise to keep their names confidential; at least that is what the press said. So much for transparency. We never did find out just who had made these suggested changes.

The Aftermath

The Legislative Education Study Committee (LESC) added the topic of the science standards to its agenda for its Oct. 26th meeting. This was the second time that pro-science constituents needed to show up, but many had already taken vacation to speak at the PED meeting. Many teachers wanted to be there, but they can lose evaluation points based on days absent. But advocates did attend. The crowd was not nearly as big as the Oct. 16th hearing, but there were enough to speak for a few hours. The night before, the Secretary-designate released to the media that he would accept the NGSS standards without modification, with only six New Mexico-specific new standards. That word got out quickly, and most people took it as very good news, but some of us worried. After all, we had been told that we had never spoken up about this before. We were told several different versions of who contributed to the very bad changes and why that happened, but had learned nothing about the specifics. And at least one group of people, a number from CESE, had taken the Secretary Designate up on his words to the media: he said he would meet anyone, anywhere, at any time. And he accepted a meeting. But, about an hour and a half before the scheduled time, he cancelled, after some people had left home to attend the meeting.

So what really happened after the PED meeting? We are not really sure. The new rule was published indicating that the NGSS would be accepted as written and six new standards were added, specific to

New Mexico[8]. In other words, it looks like we won the battle. Let's hope that this doesn't turn into an ideological war.

We wanted to work with the Secretary-designate; we still want to work with the Secretary-designate; we are still looking for that transparency that his boss had promised, but we have not seen it, yet. Who made the changes, or who ordered the specific changes to the NGSS that were originally proposed? Why didn't the Secretary-designate attend a simple meeting after promising to, or rescheduling the one he cancelled?

We are pleased that the NGSS were adopted in full, even if there are six new, but unnecessary, New Mexico-centric standards. We can live with that. But we have always wanted to work with the PED to effect change and help look at educational data from a different point of view. We used to be welcomed at the PED; but we don't feel so anymore. There also used to be more transparency; real transparency. Where is it? Will it ever come back? Will the Secretary-designate accept a meeting with us and let us show him how we have helped in the past and hope we can help in the future? Nobody knows and that is a real shame. We are here and waiting to prove that we have much to offer. But we are still not sure why our early input to the MSAC was ignored and who has the ear of the PED. Can we trust the PED to put NM Kids First or if they will still insist on relying on unnamed special interest groups to determine the educational landscape in NM?

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A Toon by Thomas

"The real lesson being taught to our children by this [a teach-in critical of PED standards] is that public posturing is more important than face-to-face dialogue."

PED Acting Secretary Chris Ruszkowski, October 13th, 2017

Three days later, the PED's long-awaited hearing on proposed science standards was held. Hundreds showed up to comment, but the room only allowed 140 people. The Interim Secretary did not attend.

So much for "Face-to-face dialogue"!

Has the PED really restored the full NGSS standards?

"Trust, but Verify" Russian Proverb

Notes From the Trenches: Why We Lose Teachers

Lisa Durkin

Let me begin by saying this: I love teaching kids. I do. If I didn't I wouldn't have been at it for almost 30 years, and I wouldn't have an exemplary rating on my evaluation either. What I've noticed is how, over the past two decades, teachers have moved in and out of the profession as if it's a carousel ride. The dynamics at work in this miasma have to do with the clash between ideology and reality. It's popular for people to value what they think teachers should do, but they don't value what teachers actually do. We can no longer pretend that policy born of this misconception is working.

Here's an example. In the 1988 movie Stand and Deliver, did you notice that the teacher, Jaime Escalante, began with a class so chuck full of kids that many of them had to stand at the back of the room for lack of seats? Yet there were only eight inspired kids who won the big math competition at the end of the story. In today's educational era, Mr. Escalante would be rewarded with an ineffective rating on his evaluation. The administration would put him on a growth plan. Throwing away 80 percent of the students in a class, for the benefit of eight kids, is not applauded, and it shouldn't be. This romanticized view of the teaching profession is causing trouble.

Here's an example from my world. A few days ago there was a purple condom on the floor after fifth period class. You know, THAT class, the one with the kids that I want so much for, yet they don't see it, and even when they do, they don't believe me. It's not that they come from such deplorable conditions that they have no context for trust. For some kids that's true, but there's fewer of the downtrodden than sympathetic folks estimate. No, these are the kids who come from a place, deep inside, where doing the hard work necessary for personal investment is met with a shrug – yeah, that's for someone else.

For decades the narrative has been about how our schools are failing our kids. One reform initiative after another has rolled by with no significant educational gains. Absent from the discussion is the question; what have kids done to pass? Most kids do strive for educational growth, but too many don't. The assumption is that every kid works their heart out to learn, while educators fail to teach them.

Those generous souls who enter the teaching profession, do so knowing they will never pull-down six figures. After a Herculean effort to prepare lessons that might grab children and lift them from their complacency, one of them left a purple condom on the floor. On many occasions it feels like I'm throwing pearls before swine.

It isn't as if I have issues with classroom management. I must say I've done it effectively for years. I have to. Those who don't learn how to be firm, fair, and consistent in correcting immature and deviant behavior, flee teaching. It's a survival technique. Instruction is impossible when a teacher is thrown from their horse every day.

Socio-demographics and poverty are all sanitized terms bandied about by the educational community with hopes of explaining why some kids don't learn like others. The issue is motivation.

Everyone wants all kids to learn. "Let's not leave a single one behind." It's as if teachers are either too lazy or incompetent to get on board. "Whip those teachers into shape! Make them accountable for their lassitude," heralds the cry! I guess the reformers missed the condom on the floor. They didn't understand that teachers put more effort into the success of their students than many of their students.

Motivation is tricky. It seems like a teacher simply needs to stimulate their kids, so what's the big deal? They should make education more fun, create lessons on an iPad, or analyze test data to target struggling students; that'll do it. Well, if you believe that, deep in your heart, it will deflate your ego to hear that, whatever you think a teacher should do to spark enthusiasm, there are sometimes insurmountable obstacles. If a kid is motivated from the outside by tricks and treats, they never learn to motivate

themselves. Without intrinsic motivation, educating the apathetic is sunk. Non-biased statistical analysis corroborates the absence of this reality. Worse yet, no one has the solution. If we did, kids wouldn't get left behind. No amount of retribution aimed at educators will help; it only makes kids brazen.

Since 1965, when the federal government became involved with reforming schools with the Elementary and Secondary Education Act (ESEA), schools have witnessed one reform initiative after another to fix the problem. Schools have improved, but correlation between reform initiatives and educational outcomes is less than stellar. Perhaps it's time to concede that the latest round of accountability initiatives hasn't fared any better, in fact, academic mastery is on the decline, especially in New Mexico. Teacher attrition is quite alarming, especially in socio-demographically challenged schools where we need good teachers the most. Without adequate staffing, schools are in deep trouble. Alas! CESE has a way to look for solutions, but that's for another column.

It wasn't the teacher who left the condom on the floor. It was a few students who did, typifying their utter disregard for what education has to offer, which is paved by societies message that they are victims of a system that has failed them. As teachers toil to bridge the gap between the achievers and the less inclined, the responsibility for learning is shifted to teachers. Student then have no sense of urgency to try harder or show respect. This simple fact explains why it is the schools with challenging socioeconomics, where educational attainment is rarer and teacher attrition is the highest.

What does it look like when the education system is broken? Unlike a business, the doors of the school will open every fall, no matter what. Kids are generally good and decent down inside. I truly and honestly believe that. This isn't a commentary on the failures of society. This isn't whining either. The reality is that teachers, like anyone else, are ground under heel when what they have to offer isn't valued. I look forward to the day when condoms on the floor are a thing of the past.

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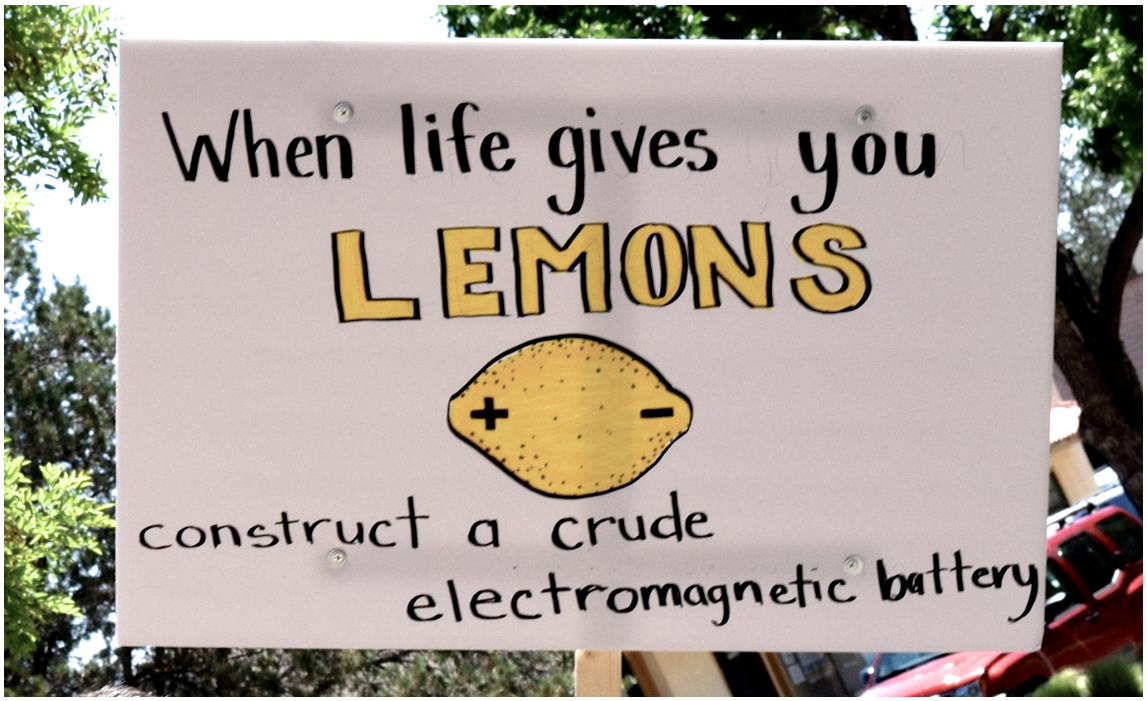

Socorro, NM March for Science, April, 2017

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