

Modern Education Reforms in the United States, 2000–2012

John Richard Schrock and Eric Yixin Yang
Emporia State University, KS 66801-5087

In 2003, Schrock described the major U.S. Education Reforms affecting biology teachers from 1960 through the end of the 1990's (Schrock, 2003). Here, the last decade of U.S. education reforms are described and data are provided on the effects of these reforms on U.S. science literacy and biology teacher production.

In summary, nearly half of the states had enacted high stakes state-wide uniform exams for high school graduation by 2000. Under President George W. Bush (2002-2008), his “No Child Left Behind” policy required states to follow federal policies requiring testing in math and reading, causing a dramatic decrease in science education at all school levels. As many students who were not capable attended and failed college, encouraging students to pursue career and technical education has increasingly taken resources away from bonafide science courses and watered down the science curriculum. As American students become more spread out in their academic abilities with many students performing below grade level, teachers were forced to diversify their coursework and collaborate with other teachers to provide remedial coursework. Computer and media companies gradually increased the use of “paperless” media, claiming textbooks and other teaching methods were not “21st Century Learning.” Computerized modes of education promote a “personalized” education. The number of online “schools” increased dramatically, in part serving students who dropped out of regular schools.

State “High Stakes” Graduation Exams

The number of states requiring students to pass a state exam to graduate from high school rose to 21 and has leveled off. These states are along the east and west coast and the southern U.S. where there are dramatic teacher shortages. When there are many teachers teaching out-of-field, the grades they give students were not as reliable. Requiring an exit exam standardized the grading but also caused good teachers to teach-to-the-state-test. Before 1990, only the state of New York required a test to graduate. This “Regents test” required only a few weeks of preparation and did not keep the science teachers from engaging students in creative labs and questioning. The Midwestern states had fewer out-of-field teachers and did not resort to the “high stakes” testing. Most of these 21 states have indicated they will also adopt the new national “Next Generation Science Standards.” It is not known at this time if the future NGSS national test planned for 2015 will replace the various state science tests being used for graduation.

“No Child Left Behind”

While he was Texas Governor, George W. Bush implemented a penalty system for schools that had high numbers of students who performed poorly on newly-required tests. When he became President, he applied the same system nationwide. In the United States, the bulk of state taxes fund schools and the state controls educational policy. The federal government is actually prohibited from having a national curriculum. But federal money goes to states to fund about 7 percent of school expenses for handicapped students and other special reasons. President Bush therefore tied each state’s receipt of federal money to compliance with his system that penalized schools if they failed in continuously raising test scores until every student was reading and doing math at grade level by 2014. However, these tests were state tests that varied from state-to-state. As it became more-and-more difficult to reach the 100 percent mark as 2014 approached, schools required elementary teachers to shift as much teaching time to reading and math. Many schools reduced or eliminated the teaching of science for younger students (Gardiner, 2009).

Career and Technical Education

As teachers began teaching-to-the test, they left out activities including labs and field trips. Student interest in school declined and high school dropout rates increased to 30 percent. In addition, the ranking of U.S. students on international tests (TIMSS, PISA) continued to decline as students from other developed nations with lower poverty rates increased their proportions of young adults with a college education. In addition, U.S. businesses and industries complained that recent students were had fewer academic and work skills. As a result, state boards of education directed schools to offer students “career

and technical education” with the expectation that students who believed they were aiming toward a future specific job would work harder in class. This “reform” will continue for additional future years. However, the dropout rate has not significantly improved and some rigorous science courses have been modified to become easier science courses stressing applications in industry.

Collaborative Teaching

With all 50 states under pressure to raise the scores of low-performing students, teachers were directed to spend more effort bringing these students’ scores up to minimal proficiency in math and reading. As it became more difficult, poor-performing students were scheduled for extra classwork in math and reading. Sometimes called a “Multi-tier support system” or MTSS, teams of different teachers were required to focus on these students. Everyone understood that another purpose of this was also to encourage less-effective teachers to adopt newer teaching methods. Because the “100 percent of students proficient by 2014” became an impossible goal, and the U.S. legislature was deadlocked and could not make any decisions, the Secretary of Education provided waivers from the NCLB requirement in 2012. While testing remained, the “100 percent by 2014” requirement has been taken away for the majority of states. Without this pressure, collaborative teaching, similar to “diagnostic teaching” in 1964, is rapidly disappearing.

Dual-credit or Concurrent Enrolment

Because high-performing students were left behind by the No Child Left Behind system that ignored them and shifted resources to helping low-performing students, parents of good students looked for courses that would serve their students. Prior special arrangements were available in most states for the rare high school student who is exceptional and can complete college courses. Rather than have the student leave the high school to attend a few college classes, they could receive “dual credit” or be “concurrently enrolled” in both high school and college for one single course. When schools shifted attention and resources to the poorly-performing students, many of the more capable students enrolled in these courses to the point that many average students now take these courses in high school and get college credit for the course. Despite many of them being unable to perform well in college later, this practice is spreading as public and private universities base their success on constant growth.

Value-added or “Growth-Model” Accountability

State education officials who realized that it is impossible for 100 percent of children to perform at grade level in reading and math pointed out that under No Child Left Behind, their school was penalized when a 4th grade child was not reading at 4th grade level, but that the teacher may have brought the child forward from a 1st to 3rd grade level in just one year and that they should not be penalized. Based on the business model of “value-added,” the growth model substitutes detailed measurement of student growth for the NCLB requirement of all children performing at grade level. Many of the waivers granted by the Secretary of Education have involved using the growth model.

“21st Century Learning”

The computer industry in the U.S. is very powerful and continues to send many free publications to schools from elementary to university levels, promoting computers and the internet as a solution to all education problems and blaming teachers if they do not use the technology. Using the change in the century, the computer companies accuse any teacher who is not using the newest technology of not supporting “21st Century Learning.” The shift to the term “learning” is a shift to placing the responsibility for learning to the student and minimizing the role of the teacher. All of these reforms involve buying the most advanced computers and smart phones to access lessons on the internet. Rich schools are shifting from use of paper textbooks that are carefully reviewed by science specialists, to using online “textbooks” and websites that are often incorrect. In addition, unlike printed textbooks that last for many years, the expensive technology rapidly becomes obsolete and unable to run the new software and hard media, costing schools from 10 to 20 times more than the textbook. Students in poor communities do not have access to internet connection at home and cannot complete homework, causing a serious injustice. Teachers spend substantial time trying to place all assignments online. Students who can access the lessons spend substantial time making the programs work rather than learning the science. “Flipping a classroom” is a current reform where the teacher assigns students to “research” a topic online and present

it to the class, leaving class for questions and discussion rather than lecturing. Advocates assert that this makes students more responsible for their own learning and that each student can advance at their own speed. So far all evidence is that our students are less responsible for learning and are learning less science.

Online Education

Because online courses have difficulty proving that the student has spent the time and effort to learn, technology advocates are lobbying to end the “Carnegie credit hour” that is a measurement of the classroom meeting time combined with tests given by the teacher to determine if the student has learned. Under the argument that the Carnegie unit is “mere seat time,” the technology advocates are asking for all credit to be based on external tests of competency.

For-profit online high schools and universities have arisen as business enterprises that mainly offer courses and degrees of questionable value. They spend far more money on advertising than on teacher salaries. Many advertise that a student can complete a diploma or degree in 18 months while the student continues a full time job. Because they operate under the idea of “free enterprise,” it has been difficult for the government to shut them down.

Competency-based Education

The U.S. and Canada already use the General Educational Development or “GED” as a substitute for completing high school. A Western Governor’s “University” offers college credit without courses and merely for taking what are standardized final exams. Students can gain credit for coursework by merely studying for the test for a few days. The problem with avoiding a true teacher-student interaction was readily described in 1199AD by the Neo-Confucian scholar Chu Hsi when he said “a scholar must know the difference between an education and an examination.”

In addition, the U.S. system continues to blame teachers when any student fails to learn. As a result, the number of science teachers retiring early or leaving teaching is increasing. And the number of college students entering science teaching has fallen over the last decade.

U.S. schools are still not allowed to “track” students into college-bound and non-college-bound students, although we may be able to group students by “ability grouping.”

All of these reforms have originated in and been promoted by education schools that continue to drive U.S. education policy. Unlike China, most U.S. secondary teachers continue to be trained in education schools rather than in the content department. This continues to prevent any discipline-based educational reforms.

References

Griffith, George W. 2009. *The Initial Impact of No Child Left Behind with a Focus on Time for Elementary Science and Equity in Science, Math, and Reading*. Ph.D. Dissertation, Kansas State University. 206 pages.

Schrock, John Richard. 2003. A Summary of Modern Education Reforms in the United States *Shengwuxue Jiaoxue* 28(3): 9–12 [in Chinese].