



The Claremont

Letter

Examining current issues in education highlighting the ongoing work of the faculty of the School of Educational Studies at Claremont Graduate University.

This issue of the Claremont Education Letter examines common mistakes educators make and how we can learn from those mistakes.

Three Flaws in the Education System and How to Fix Them

By David E. Drew

Whenever international assessments of student achievement are conducted, in which tests of subject matter knowledge are given to students around the world, the United States scores poorly. I will identify three mistakes American educators make that undermine student learning, and suggest how these problems can be corrected.

Mistake 1: Basing educational decisions on aptitude.

After years of conducting research, I believe the single biggest mistake educators make is to tell some—actually many—students that they are not smart

enough to master complex material, e.g., mathematics. That statement is wrong 99% of the time. Yet, frequently students of color, girls and women, and students from poverty are discouraged or prevented from studying the subjects they need because of such erroneous judgments.

There is a long, and misguided, tradition in this country of basing important admissions, assignment, and pedagogical decisions about students on aptitude. For example, the SAT, which is a key gatekeeping test for college applicants, originally was designed to measure aptitude. Many have forgotten that the A in SAT stands for aptitude. The



College Board now refers to the exam only by the acronym SAT, much as Kentucky Fried Chicken now refers to their product only as KFC, in an attempt to make people forget that pesky middle word, "fried."

Several years ago I was talking with a colleague who is a mathematics professor in China. He noted that virtually every student in China learns advanced mathematics, while only a few do



School of Educational Studies at Claremont Graduate University

For more than 75 years, the School of Educational Studies (SES) at Claremont Graduate University (CGU) has been a leader in providing graduate education. Many of our more than 5,700 alumni have held positions as college presidents, superintendents, principals, award-winning teachers, and tenured professors at colleges and universities around the world.

so in the United States. He said that in China it is assumed that everyone can master advanced concepts, and everyone is expected to do so. He said that in America we have this “strange concept of aptitude.”

Our task as educators is to make sure that every student masters the mathematics or science or history he or she needs; virtually every student has the capacity to learn these subjects.

Since aptitude measures are highly correlated with socio-economic status, i.e., with affluence, the use of aptitude in deciding students’ options has become an allegedly scientific method of preserving the economic status quo and keeping people down. Perhaps not intentionally, the measurement of aptitude has become an instrument of discrimination.

It is time we sent the concept of aptitude (or intelligence) to history’s wastebasket. The concept has done more harm than good, particularly when politicians and others try to advance the erroneous idea that some groups are genetically inferior to other groups.

Early in the twentieth century, statistician Karl Pearson argued that Jews were innately inferior and perhaps not worth educating. In the 1980s, the authors of *The Bell Curve* argued that African-Americans were innately inferior. Over time, both arguments have failed the tests of both rigorous scientific review and experience.

Even erroneous ideas can have powerful effects. Psychologist Claude Steele identified the phenomenon of “stereotype threat”—destructive performance impeding anxiety that results from an awareness, often subconscious, that others erroneously believe you are less intelligent because of your ethnicity or impoverished background.

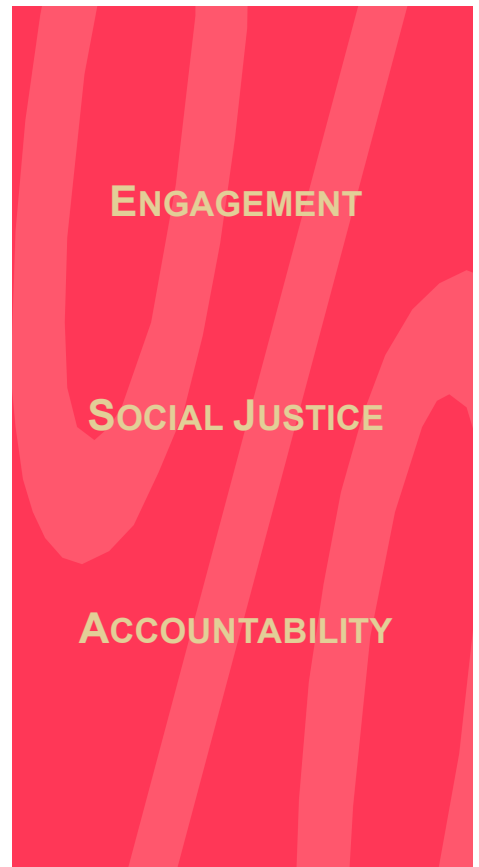
Young women who are told by authority figures that they are not smart enough to master or excel in mathematics and science are less likely to pursue careers in those

fields—except for those who are unusually resilient and self-confident. Many young women, including the best and the brightest, have become convinced that they are inferior.

In a 1994 study of the science pipeline funded by the National Science Foundation, I examined a national sample of college students who were asked to rate their own ability in mathematics twice—as first-year students and again three years later. I studied only those students who were in the top ten percent, based on their score on the quantitative portion of the SAT. Though they had been told their score and their percentile rank by the College Board, only about a quarter of the women who actually *were* in the top ten percent *believed* that they were, in both surveys.

The earliest women mathematicians, like early African American scientists and inventors, had to overcome both prejudice and insufficient recognition of their work. For example, historian K.D. Rappaport noted that both Sophia Germaine, who received the grand prize of the French Academy of Sciences in 1816 for her paper “Memoir on the Vibrations of Elastic Plates,” and Mary Fairfax Somerville, who presented a paper titled “The Magnetic Properties of Violet Rays of the Solar Spectrum” to the Royal Society of London in 1826 and who was elected an honorary member of the Royal Astronomical Society, were self-taught. Both had to hide their studies of mathematics from their families, who didn’t approve of their daughters studying such material. Many years later the Women’s College of Oxford was named Somerville College in recognition of her achievements.

Because intelligent women were suspect, Sophia Germaine signed the name LeBlanc to her writings and letters. Augusta Ada Byron Lovelace, arguably the world’s first computer programmer, published under the initials A.A.L. The Defense Department programming language is named ADA in her honor.



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-From our mission statement

Programs to confront these negative expectations and prejudiced beliefs have dramatically reversed the male/female achievement gap as well as the White/minority achievement gap. For example, during the past five years my colleagues and I have observed such turnarounds in colleges and universities in Louisiana and Texas. Such programs focus on recruitment, consistent and engaged mentoring, and providing resources to support a peer culture in which students work collaboratively towards academic achievement.

CGU's Gail Thompson has identified the factors that facilitate the resilience and achievement of successful African American students, including effective and supportive teaching.

Instead of focusing on the elusive concept "aptitude," educators should build programs characterized by effective teaching, supportive mentoring, and collaborative learning. Students should be evaluated based on their achievements, not their so-called aptitude.

Mistake 2: Failing to learn from research and experience.

If educational reform is to be effective, educators and political leaders must learn a common language and depart from jargon. For example, educational researchers (like me) write articles containing statements such as: "In the hierarchical multiple regression analysis, the beta for the treatment effect approached significance. If we had access to a larger sample, thus avoiding a possible Type II error, or had measures of additional covariates, the beta might have been statistically significant. Nonetheless, the regression findings are of great heuristic value." Translation: "The program didn't work. Maybe we did the evaluation study wrong. If we're lucky, we can find something useful here."

Politicians say things like this in their speeches, "The problems in

our schools really aren't that complicated. All we need to do is return to the basics." Translation: "I've got a good job, earn good money, and I went to a small town public school during the Eisenhower administration. If we would just return to the 1950s, everything would be fine."

Politicians believe many educators can't speak English and deal directly with problems. They are right. Jargon serves no purpose except to make professors feel important. It obscures the important messages the researchers are trying to deliver. Educators believe many government officials don't understand the complexity of the social, educational and economic problems that plague schools. They are right. Politicians have a low tolerance for nuance.

Scholars have learned a lot about what works in schools. But they have failed to communicate this to the public and to our leaders.

In addition, most educational policy debates don't consider history, as though this were the first time a given issue was confronted. But we can learn from the successes and failures of the past.

Debates about bilingual education have been conducted as though Americans had always been taught in English and only the recent influx of immigrants from Latin America, Asia, and elsewhere forced us to consider instruction in other languages. However, in the early days of this Republic many schools, particularly in Pennsylvania, carried out instruction entirely in German. One expert estimated that one million pupils attended public bilingual schools during the 1800s, when the U.S. population was much smaller. In the third Congress, two Congressional committees debated whether to print all federal laws in German as well as in English.

In debates about the effective uses of computer technology in the classroom, critics of these instructional innovations make three arguments: (1) the teacher is presented with a prepackaged

curriculum; (2) the more students work on computers, the less they will interact with teachers; (3) the latest hardware and software are more available to affluent students. Each of these arguments has some merit. But in an earlier era, each of these arguments was also made to oppose the introduction of books.

Mistake 3: Relying on poorly designed testing programs.

We have entered an era of high-stakes testing, epitomized in the Federal No Child Left Behind (NCLB) Act. Much about this is positive. Statewide testing can correct for teacher grading biases. Disaggregated student achievement data allows decision makers to identify schools with overall high achievement levels that are shortchanging students of a particular ethnic group or from impoverished backgrounds.

But there are three major problems in the implementation of high stakes testing that I will address.

First, there is too much testing. This steals time from the instructional program and significantly increases student anxiety levels. Both effects reduce student learning. Second, virtually all testing is done with standardized, multiple-choice exams, although we know that such testing only scratches the surface of assessment of learning. Third, frequently norm-referenced tests, which score on the curve, are used. But we should be assessing whether a student has mastered the material, regardless of what his or her peers know, through criterion-based tests.

As a metaphor to illustrate these problems, imagine that the federal government and the states have launched a new program to evaluate and improve hospitals. Suppose they decide to conduct rigorous assessment of the health status of those released from each hospital. There are many indicators of health status; one important measure is blood pressure.

A. Suppose the testing program was to assess only each

patient's blood pressure. This would mean ignoring other vital indicators of health status. Furthermore, serious health evaluations require the experienced clinical judgments of a health professional.

- B. Suppose, further, that nurses had to measure each patient's blood pressure once every half hour. This repeated testing would add little to our assessment of a hospital, but would prevent patients from engaging in the very activities, e.g., aerobic exercise, that would lower their blood pressure.
- C. Suppose hospitals and patients were assessed not against a nationally-recognized standard, e.g., readings of 120/80 or lower, but by comparison with other patients. What if many of the comparison patients had high blood pressure, partly due to poverty's effect on their diet?
- D. Now suppose the hospitals that performed poorly on the blood pressure tests were told they had to improve or risk heavy federal sanctions, but were given no resources, e.g., blood pressure medication or educational materials, to change the situation.
- E. What if the best health professionals left hospitals for private practice because the constant focus on assessing blood pressure dramatically interfered with their ability to apply their expertise?

This may sound ridiculous, but this is what we are doing to our schools and to our students.

Recommendations: Mistake 1

David E. Drew is Professor of Education and Executive Management at Claremont Graduate University. His research focuses on the development, management and evaluation of programs to strengthen research and development and to improve mathematics and science education.

No educational decision should be based, even in part, on assumptions about a student's aptitude or intelligence.

Mistake 2

- A. Researchers should be required to learn and use clear writing. They should be penalized for using jargon whenever clear English would suffice.
- B. Government agencies should develop mechanisms for scanning and summarizing the research literature, and then taking it seriously.
- C. Educators should train specialists who bridge the gap between researchers and decision-makers.

Mistake 3

Those designing tests and testing programs should:

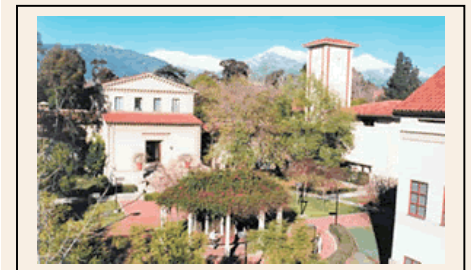
- A. Use criterion referenced tests only.
- B. Sharply reduce the number of school days and hours devoted to testing.
- C. Incorporate more testing modalities, beyond multiple choice exams, even if that means more work for those conducting the tests.
- D. Insist that the teacher's holistic judgment be weighted more heavily than the standardized test results in a given student's assessment

We can provide more successful schooling for our students if we focus on achievement, develop more effective assessment programs, and build on lessons learned from history, experience, and research.

I wish to thank the following colleagues who commented on an earlier draft: Hedley Burrell, Charles Kerchner, Daryl Smith, Gail Thompson, and the students in my multivariate statistical analysis course (Ed 467).

Claremont Graduate University

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The Claremont Letter is published three times per year in the **fall**, **winter**, and **spring**. If you would like to subscribe or unsubscribe please send an e-mail to ses@cgu.edu.