America 2000: An Education Strategy


On April 18, 1991 President Bush released America 2000: An Education Strategy. It proposed six major, long-range educational goals. These goals can be grouped into three categories. First, there are two goals that focus on improving the plight of preschoolers and on making schools safe places to be. Clearly these are laudable and worthy of intense effort.

Second, there are two goals that focus on high school completion and on adult literacy. The general idea here is that functional literacy is needed for all citizens and that the overall average level of education needed by adults is increasing. These goals are consistent with changes being wrought by the Information Age.

Finally, there are two goals that focus on student achievement. Nationwide competency testing is strongly encouraged; there is a specific goal that "By the year 2000, U.S. students will be first in the world in science and mathematics achievement."

Competency Testing

The America 2000 document calls for competency testing at the 4th, 8th, and 12th grades in English, mathematics, science, history, and geography. I find the list of subjects to be tested interesting because of what is omitted. For example, in the Information Age it would certainly be desirable that every student would learn one or more languages in addition to English. There is no mention of the arts or of international studies. The emphasis is on testing in specific subject areas rather than on interdisciplinary understanding of how to use these basic subjects to creatively approach and solve a wide range of interdisciplinary problems. The overall flavor of the competency testing recommendation seems closely aligned with a back-to-basics, mimetic approach to education.

There are two major difficulties with our current testing system. First, performance on the objective types of competency tests being used in the U.S. is not a good measure of preparedness for responsible citizenship in our Information Age society. Second, the tests themselves have increasingly shaped the curriculum. Curriculum content and process is increasingly being designed to raise test scores on the types of tests used for nationwide assessment. Taken together, these two difficulties, along with quite a lot of supporting research on testing, strongly suggest that increased use of objective types of competency tests will not improve our educational system.

There are very good alternatives to objective tests. The terminology "authentic assessment" refers to performance-based tests that closely resemble the area being tested. Clearly, it is not appropriate to use an objective test to determine if a student can draw and paint, compose and perform music, or perform well in athletics. Educational researchers have gradually come to realize that the same observation holds true for performance in writing, mathematics, and other academic areas. They conclude that the nation would be better served by a major decrease in objective testing, substituting instead authentic assessment.
Science and Mathematics

I read the America 2000 report while I was flying at approximately 600 miles per hour, at an elevation of 33,000 feet, on the way to a meeting several thousand miles away from my hometown. During the same flight I read about an international track meet. At the track meet, by dint of a lifetime of intense physical training, the best pole vaulters in the world cleared nearly 20 feet and the best runners covered a mile in a little under four minutes. These outstanding human performances pale to insignificance when compared to machine-aided performances. This set me to wondering about international competition among students studying science and mathematics.

The "knowing and doing" tools used by scientists and mathematicians are changing very rapidly. The world's scientists are now quite dependent on computer-based instrumentation for the acquisition and processing of information as well as for controlling experiments in process. We now have mathematical software that can solve the full range of math problems that students study up through the first couple of years of college.

In light of the impact of Information Age technology on science and math, what should students be learning? Should students learn in a high-tech environment that includes routine use of the modern tools for knowing and doing science and math? Many people argue "yes." Students should be educated in an "authentic" environment that closely resembles the environment in which, as adults, they will be expected to perform. There is a clear trend in this direction. For example, many school systems in the U.S. now provide students with handheld calculators and encourage their use throughout the curriculum.

Recommendations

To a great extent, we understand the challenges that face our nation's citizens in the Information Age. We know that education must prepare students to make effective use of an ever-improving set of tools to address an ever-changing set of problems. Thus, school restructuring must include restructuring for the Information Age. This means that students need to have appropriate access to the tools for knowing and doing that are routinely used by adults. It means that assessment must be authentic. Students must be assessed in the environment of the tools that they are learning to use and in the multidisciplinary problems that they are learning to solve.