

were empowered by instruments that allowed them to test water from the school's drinking fountains, said Robert Tinker of bridge-based nonpr search center. The dence and the adm when they quickly perts on the school's

many schools. It uses student observations of the sky as a focus for bringing together knowledge from

sense of what scientists do and to provide examples and role models for them to follow.

a New Hampshire inven-preneur, said the idea est came to him after he lf shocked by talking to o were walking through

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Lagging US test scores called misleading

By David L. Chandler
GLOBE STAFF

Tests that seem to show US students far behind those in other countries in math and science may not really reflect meaningful differences, according to new critiques of those comparisons.

For years, educators have decried what appeared to be a frightening disparity between scores of American students on standardized math and science tests and those of students in other countries. The gap, many thought, explained why the United States is losing ground in the international economic arena.

But the comparisons are fatally flawed, said Iris Rotberg, an educator with the Rand Corp.'s Institute on Education and Training, who spoke yesterday at the Boston meeting of the American Association for the Advancement of Science.

For one thing, she said, there are vast differences among nations in terms of the proportion of low-income students who are in school, and who therefore take the tests. The

United States has "a higher proportion of poor kids than most industrialized countries, and this has an effect on test scores," she said.

There are also significant differences in the curricula, which result in big differences in test scores. But those may not be very significant, said Rotberg and other educators at the session on international comparative test scores. "Because of differences in the societies, it's simply not possible to select comparable samples" of students, she said.

While these educators do not question the importance of improving science education, they emphasize that the impetus for change should not come from such international comparisons. All nations have plenty of room for improvement in science education, Rotberg said, but the needs differ from country to country. How best to reform science teaching "is a reasonable debate, and it can't be decided by test scores," she said.

"The kind of agonizing that goes on in the US about the quality of our education is going on all over the world, both developing and developed," said Sylvia Ware of the American Chemical Society's education division.

"The glory of the American system is its flexibility," she said. Whereas rigorous testing to narrow the field of applicants to college are the norm in many other countries, the American system "provides late bloomers with opportunities."

Rotberg said that while some say there is no harm in the unfavorable test comparisons with other countries, since they provide an impetus for improvement, Rotberg said "I believe it matters. The rhetoric is not consistent with the facts."

The danger is that "the emphasis on tests leads to 'silver bullet' solutions." What is needed instead, she said, is an effort to improve the "problems of inadequate resources," especially in less affluent areas.

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