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## From the Editor

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How can students be encouraged that educational progress is happening? The usual encounter with formal education is often painful and filled with tension. If these latter elements are replaced by joy and excitement students often need reassurance that learning is occurring.

It took me many years after I graduated from college to come to believe that I could make an original, significant contribution to knowledge or to the state of the world—or to myself—that my task was not to prepare for examinations and learn what others had done, but rather to respond creatively to my environment. The job of education is not only to transmit knowledge or culture, but to encourage creative responses.

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Rita Colwell, director of the National Science Foundation (U.S.A.) was interviewed by K.C. Cole of the Los Angeles Times (March 8, 2001). Dr. Colwell, a biologist, had good things to say about mathematics:

“Mathematics reduces complex problems to the fundamentals...You can express complicated situations in a way that’s clearly understood, and allows you to make predictions...”

*But isn’t all the mathematics that you need...already out there?*

“Not at all. It will require new mathematical research. Before mathematics concepts can be applied, they must be invented. This is not going to be achieved by simply linking together the computers we’ve got. We’re moving into entirely new approaches, computers for the future...”

“But we haven’t talked about beauty. Mathematics is so soul-satisfying. There’s such enormous beauty in mathematics, and scientists have almost been embarrassed by the fact that the work they do is beautiful.”

*But doesn’t the problem with mathematics start...in grade school?*

“We know that the ‘valley of death’ is between fourth and eighth grade, for both math and science...”

“We’ve been hoping, dreaming of a plan to start centers for the science of learning that would focus on education in science and math with as much intensity as we now put into other areas of research in science and engineering...”

“Now look at education. In 1900 we had books, teachers, classroom, blackboard, desks. In 2000 we have books, teachers, classrooms, blackboards, desks. A lot has happened in understanding how humans think, in the cognitive and behavioral sciences...Why hasn’t all this new knowledge infused education the same as it has for transportation and medicine?”

“...The United States Commission on National Security / 21st century recently concluded...that a greater threat to U.S. national security, more than any potential political war...would be the decline and loss of vitality and strength in science and engineering research and education in the U.S. And I agree.”