U.S. public's knowledge of science still has a long way to go

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Amid concerns about the lagging math and science performance of American children, American adults are actually scoring higher than they did 20 years ago on a widely used index of civic scientific literacy, according to a University of Michigan researcher.

In 1988, just 10 percent of U.S. adults had sufficient understanding of basic scientific ideas to be able to read the Tuesday Science section of The New York Times, according to Jon Miller, a researcher at the U-M Institute for Social Research (ISR). By 2008, 28 percent of adults scored high enough to understand scientific ideas at that level.

Despite the improvement, the American public has a long way to go, says Miller, who contributed to the latest publication of the *American Academy of Arts and Sciences, Science* and the *Educated American*.

"America's democracy depends on having a larger number of scientifically literate citizens," said Miller, who directs the ISR International Center for the Advancement of Scientific Literacy and has pioneered methods of assessing comparative levels of scientific understanding over time. "Today's political agenda includes debates over global climate change, embryonic stem cells, future energy sources, and the possibility of a viral pandemic. And as the twenty-first century progresses, scientific issues are only likely to become more prominent features of the political landscape."

In fact, America is the only major country that requires almost all its

college and university students to complete a full year of science, Miller points out. So the scientific literacy of U.S. adults is relatively high compared to the general adult populations of other developed nations. But given the on-going changes in many fields of science, most adults will learn most of their information about science after they leave formal schooling.

To track changes in scientific literacy over time, Miller developed sets of durable, core questions that assess understanding of basic scientific constructs in several areas. These areas include understanding of simple probability statements, the relationship of atoms, molecules, and electrons, of the universe and solar system, and the life sciences, where public confusion is greatest. With funding from a variety of sources, including the National Science Foundation, he surveyed national samples of the U.S. adult population in 1988, 1999 and 2008 to assess levels of what he calls "civic scientific literacy."

Only 37 percent of American adults accepted the concept of biological evolution in 2008, Miller reports, and the level of acceptance has declined over the last twenty years. Approximately 44 percent of American adults can define DNA correctly, but only 20 percent can define the meaning of a stem cell.

While 85 percent of adults recognize that all plants and animals have DNA, only 27 percent of Americans think that more than half of human genes are identical to those of mice.

"Looking to the future, we must increase the proportion of scientifically literate adults in our society," Miller said. "Scientific literacy is not a cure or an antidote in and of itself. It is, however, a prerequisite for preserving a society that values science and is able to sustain its democratic values and traditions."

More information: A copy of Science and the Educated American: A Core Component of Liberal Education, may be downloaded free of charge at www.amacad.org/publications/scienceSLAC.aspx

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