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Europe Rethinks Education

FOR SOCIETIES TO UNDERSTAND THE CONSEQUENCES OF VITAL ISSUES SUCH AS CLIMATE CHANGE, education—especially science education—will play a critical role. Improving the quality of science education in primary and secondary schools is a challenge faced by nearly all countries. Europe has finally recognized the need for a trans-European effort to rejuvenate the scientific education of all students, and promising efforts are now underway.

The Maastricht Treaty of 1992 left formal science education to each nation of the European Union (EU), in contrast to scientific research, which was viewed as a shared trans-European competency. But 2 years ago, Michel Rocard, former prime minister of France and then a member of the European Parliament, submitted an important report to the EU Commission.* Referencing two pilot projects (Pollen in 12 European countries and Sinus-Transfer in Germany), the report advocated that an ambitious program for inquiry-based science education be supported by EU funds of 60 million euros. Last year, a conference in Grenoble on science education, which included scientists, urged the 27 EU education ministers to support this approach. The 60 million euros are now on the way, and the investment is meeting a massive and promising response from the many institutions applying for funds.

In today's economic crisis, the disinterest of European youth in scientific careers and the public's poor understanding of science greatly threaten the future of Europe at a time when science and logical problem-solving skills are critical. Yet the performance of young people from France and Germany on science tests (the Organization for Economic Cooperation and Development Programme for International Student Assessment) is barely average, and many students leave middle school being illiterate in science. Moreover, the content of science education is often questioned, and even disparaged.

Fortunately, the science academies in France, Germany, the Netherlands, and Sweden have been sponsoring exemplary pilot projects that can serve as prototypes for additional efforts. These include the nationwide program *La main à la pâte*, which has brought inquiry-based science to about half of French primary schools. Well-known scientists, such as Georges Charpak, a Nobel laureate in physics, are among those who assist teachers. In all four nations, the "science as inquiry" pedagogy encourages students (ages 5 to 16) to develop a sense of wonder, observation, and logical reasoning. Because of their interactions with scientists, as well as new assessment and professional development methods, teachers gain increased confidence and a better understanding of science as a process.

Although education remains the responsibility of each nation, the EU open method of coordination promotes an exchange of best practices. The early trans-European Pollen project published guides for practical implementation of inquiry in schools, as well as for teacher training, and it led to a pilot project in Berlin that has expanded to over 100 primary schools in Germany. Pollen (2006–2008) only involved 722 teachers and 15,000 students, but its achievements paved the way for its successor, Fibonacci (2010–2012). With partners in 21 EU countries, Fibonacci expands to middle school and includes mathematics; using Pollen-elaborated tools, it aims to pair expert centers with emerging ones throughout Europe.

The funds generated by the EU's response to the Rocard report can only serve as seed money for creating pilot projects with a common goal. The report's eventual impact will depend on national measures that change how teachers are prepared and supported to teach science, as well as on the continued involvement of the national science academies. Only national education authorities can produce large-scale dissemination of pilot projects and the required improvements in in-service and pre-service teacher training. And only active scientists and engineers can help to convey in classrooms the message that science is a rich human adventure, vital for the future of Europe.

– Pierre Léna

10.1126/science.1175130

*M. Rocard, *Science Education Now: A Renewed Pedagogy for the Future of Europe* (Report EU22-845, Brussels, June 2007).