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Academies Active in Education

SUSTAINABLE SOCIOECONOMIC AND CULTURAL DEVELOPMENT REQUIRES NATIONS WITH A citizenry that understands science, shares its values, and uses scientific critical thinking. This can best be attained through science education that is based on inquiry, an approach that reproduces in the classroom the learning process of scientists: formulating questions, doing experiments, collecting and comparing data, reaching conclusions, and extrapolating these findings to more general situations. The Program for International Student Assessment, an international organization of industrialized nations, measures the extent to which 15-year-olds can identify scientific issues, explain phenomena scientifically, and use scientific evidence to draw conclusions. The results, made public earlier this year (<http://nces.ed.gov/surveys/pisa>), reveal that all developing countries and many industrial ones, including the United States, are failing to prepare their children adequately for life in the modern world. Leading scientists of each nation, acting through their national science academies, are working together to change this state of affairs.

In 1985, the U.S. National Academy of Sciences and the Smithsonian Institution established the National Science Resources Center, an organization that has helped to spread inquiry-based science education to nearly 20% of U.S. school districts. About 10 years later, across the Atlantic, the French Academy of Sciences engaged France's Ministry of Education with its "La Main à la Pâte" program, which today extends to most primary schools in France. The Swedish and Australian Academies similarly began major programs in their nations. Then in 2000, the InterAcademy Panel on International Issues (IAP), an organization of science academies from 98 nations, committed itself to mobilizing similar actions by academies on a global scale.

In Chile, supported by the U.S. and French Academies, the Chilean Academy of Sciences and the University of Chile proposed in 2002 to establish a national inquiry-based program called Educación en Ciencias Basada en la Indagación (ECBI). Two years later, the Chilean Academy was asked to lead the IAP's international effort, channeling it through networks of academies, each covering a major geographical region. Thus, in 2005, the IAP helped the Network of African Science Academies launch an African science education program that organized activities in Senegal, Uganda, Kenya, South Africa, Nigeria, and Cameroon. Eighteen science academies of the Asia-Pacific region met in Bangkok in 2007 and approved a regional program with IAP sponsorship. And this October, science academies in Europe will explore establishing an IAP European Regional Program during a European Union conference on science education.

These regional efforts began in the Americas in 2004, where the IAP program was established in partnership with the 16 Academies of the Inter-American Network of Academies of Sciences. This program was recognized as a Hemispheric Initiative by the Americas Science Ministers and currently supports teacher training courses, scientist-educator workshops, and short-term fellowships in 15 countries. Notably, in the past 2 years, it has generated inquiry-based science education projects in Bolivia, Panama, Peru, and Venezuela, with plans to start programs in Costa Rica, Guatemala, and the Dominican Republic.

Our ECBI program in Chile began with six schools and 1000 children in Cerro Navia, a poor municipality near Santiago. The school communities responded beyond all expectations. Attendance went up on the days when there was science class, and parents visited schools to see the children's experiments. The program has now grown to 260 schools with 90,000 children throughout the country, through collaboration among the Ministry of Education, a consortium of 12 universities, and the Chilean Academy. An evaluation supervised by a team of IAP international experts reported enthusiastic results from teachers and students: In the participating schools, children overwhelmingly chose science as their favorite subject. The Chilean Congress has now recommended that ECBI be expanded to all the schools in the country.

The efforts of the world's science academies in promoting inquiry-based science education are relatively new. But these efforts are necessary if we want to instill in future generations a fascination with scientific discovery and a firm understanding and appreciation of scientific endeavors.



– Jorge E. Allende