

Global Science Literacy

Victor J. Mayer

Fulbright Professor, Pusan National University

And

Professor Emeritus, The Ohio State University

Abstract

Global Science Literacy is proposed as an international curriculum standard for science literacy. It is based on the science curriculum construct of Earth Systems Education, which has come out of the earth science education community in the United States. The presentation will briefly describe the nature of ESE, and include, if sufficient time, an audience participation simulation of mass extinction.

Science and science education played a central role in waging the Cold War and the "hot wars" that preceded it. Now, however, science education and its practitioners have the opportunity of supporting changes in the goals of science as it adjusts to a new era. Science is being challenged by some to provide the knowledge to counter the devastating environmental problems that have been by-products of a century of war and economic conflict. It also can be employed to help solve the social problems resulting from the unfettered use of technology for political and economic gain. To support science in redirecting its goals, science educators must reexamine the very nature of science and its role in social, cultural and political systems. We must understand the broad nature of science and its methodologies, an understanding not always apparent in the professional dialog of science educators. It is our belief that such a re-examination will result in a significant change in science education; a change founded on the view that science is, after all, a study of the Earth System in which we all live, not simply the basis for the

pursuit of ever more technology.

In this talk, I offer a rationale and a developmental basis for such a re-examination by providing ideas for the application of a different approach to the nature of the science curriculum. One we have called, Global Science Literacy. Global Science Literacy (GSL) is based on developments in the United States that resulted in an approach called Earth Systems Education (ESE), a curricular basis for literacy in science. This talk will focus primarily on the substance and nature of ESE as the science curricular basis for GSL.

Earth Systems Education (ESE) uses the Earth System as the organizing conceptual theme for developing science curricula for the middle through high school levels. Children of all nations experience weather, flowing streams, and rock materials as parts of their environment. They observe the beauty of sunsets, the power of storms, the tranquility of a mountain scene, a flowing river, or an autumn day. A science curriculum organized around students' interdependence with nature and tapping into their interests in nature provides a common subject for study in all cultures. ESE includes the science methodology of the system sciences, a distinct contrast from the prevailing emphasis upon that of the physical sciences in the world's science curricula. A facility with the use of science methodology can provide the world's future citizens with universal methods of communication and problem solving as they enter the adult world.

The resulting matrix of science concepts and processes are proposed as a functional international definition of science literacy. If implemented in school curricula of democratic nations, we believe it will help citizens understand the role of science in solving environmental and social problems left in the wake of a century of world war and economic conflict. It can also contribute to cross-cultural understanding and cooperation between citizens and leaders of the democracies of the world. Thus science curricula can have a crucial role among other curricular subjects in helping students achieve a global understanding and perspective—a major objective of the social studies curriculum construct of global education.

Resources

Mayer, V.J. (Ed.) (2002). *Global Science Literacy*. Dordrecht: Kluwer Academic Publishers.

Mayer, V.J. (Ed.) (2003). *Implementing Global Science Literacy*. Columbus, OH: The Ohio State University