

Geo-Literacy: Preparation for 21st Century Decision-Making

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We all make countless decisions over the course of our lives. In the 21st century, however, Americans are increasingly being faced with two kinds of decisions for which they are not adequately prepared. I call these place-dependent and far-reaching decisions.

Place-dependent decisions are decisions that hinge on the attributes of places. They typically involve choices about location, relationships, or transportation. When a family selects a new home, a corporation chooses an international business partner, and a military leader plans an operation, they are all making place-dependent decisions.

Far-reaching decisions can be decisions about almost anything. What makes a decision far-reaching is that it has important implications for people and places beyond the focus of the specific decision. While we may not be aware of it, we make far-reaching decisions all the time. For example, a decision about how to commute has a whole chain of economic and environmental implications for other people and places. Virtually all decisions about what to purchase are far-reaching decisions, as are decisions about how to dispose of waste. Many decisions about finance are also far-reaching.

Both place-dependent and far-reaching decisions require the ability to reason about the world and how it works. To make these decisions, people must be able to reason about how their choices will be affected by conditions in the world and how their choices will change conditions in the world. At the National Geographic Society, we have adopted the term geo-literacy to describe the ability to reason about the world in this way.

We are concerned about the low level of geo-literacy in our society because of the potential costs of making poor decisions in the modern world. When people make poor choices in place-dependent and far-reaching decisions, there can be substantial costs for themselves and for others. While the impacts of any particular decision may be small, the cumulative impact of the decisions made every day in our modern society is enormous. Therefore, the National Geographic Society is committed to preparing young people for these important 21st century decisions.

The Importance of Geo-Literacy

As preparation for decision-making, geo-literacy enables people to steer away from choices that will be costly for themselves and others. For example, individuals and communities bear preventable costs every time a retail business fails because of a poorly chosen location, a fishery is damaged by stormwater runoff, or travelers and deliveries are delayed because of inefficient transportation systems. In addition to economic and environmental costs like these that accumulate over time, we also face immediate and sizable costs for geo-illiteracy in the form of loss of life from natural hazards, terrorism, and military conflict, and loss of livelihood from competition in a global economy.

While geo-literacy can reduce the negative costs of bad decision-making, it also provides the foundation for positive breakthroughs. The hub-and-spoke system of modern air transportation, the introduction of high-yield, low-impact agricultural practices, early-warning systems for national defense, and the recent revival of urban neighborhoods are all examples of advances resulting from the application of geo-literacy.

Geo-literacy has important benefits across our personal, workplace, and civic lives:

- In our personal lives, making well-reasoned decisions about where to live, how to commute, and what products to buy can save time and money, protect the environment, and improve personal health and welfare.

- In our workplaces, constructing well-reasoned plans for supply chains, infrastructure investments, and marketing strategies can reduce costs and increase revenues dramatically.
- In our civic lives, making well-reasoned plans for zoning and public transit, emergency preparedness and response, and foreign affairs can increase our safety and security, reduce unnecessary loss of life, and improve our quality of life.

The National Geographic Society's concern for geo-literacy comes from our mission. We see geo-literacy as providing the tools that will enable communities to protect natural and cultural resources, reduce violent conflict, and improve the quality of life in communities around the world. However, as these examples of challenges that require geo-literacy illustrate, having a geo-literate populace is also critical if America is to maintain our economic competitiveness and national security in the modern, interconnected world.

Because geo-literacy is critical for economic and physical security, we must address the need for it at two levels. We must raise the geo-literacy level of all members of society to meet basic individual and societal needs. At the same time we must dramatically expand the number of individuals with higher levels of geo-expertise to meet the planning and decision-making needs of 21st century business and government.

The Components of Geo-Literacy

Geo-literacy requires the ability to reason about three things: interactions, interconnections, and implications.

Interactions: How our world works. Modern scientists understand that the world consists of interacting systems. Every place on earth is shaped by the interactions of dynamic systems, both human and natural. These systems create, move, and transform resources. For example, in ecosystems, nutrients are created, transformed, and transported through food chains. Similarly, in economic systems, people transform natural resources into objects with economic value that can be transported, used, traded, and sold.

To make place-dependent and far-reaching decisions, people must understand the systems at work in specific places in order to select actions that will achieve their goals and also to anticipate other possible consequences of those actions.

Interconnections: How the world is connected. Every place on Earth is connected to every other, directly or indirectly, through human and natural systems. For example, people have always known that what we put in or take out of river systems affects everyone downstream. In our modern world, however, we have introduced a multitude of other kinds of connections. We engineer systems to pipe water and other fluids across long distances, we transmit ideas and cultures around the globe at the speed of light, and transport we transport goods and people long distances on the surface of land and water, and through the air.

To make place-dependent and far-reaching decisions, people must be able to reason about the connections that link places together, so they can account for remote influences on our actions, and so they can anticipate the impact of their actions on remote people and places.

Implications: How to make well-reasoned decisions. Good decision-making involves systematic analysis of alternatives and a careful process of weighing tradeoffs. This kind of systematic decision-making is a complex cognitive process that must be learned and practiced. In place-dependent and far-reaching decisions, an individual must be able to reason about the implications of the conditions in specific places for the alternatives under consideration and must be able to reason about the implications of selecting each of those alternatives for places that will be affected by them. They must also be able to systematically weigh the advantages and disadvantages of each alternative based on the priorities and values that apply to that decision.

The ability to analyze implications of alternatives and to weigh tradeoffs systematically is essential for making both place-dependent and far-reaching decisions.

To be geo-literate is to be able to combine the ability to reason about interactions, interconnections, and implications, in general, with specific knowledge to make decisions. A geo-literate person is able to reason about interactions and interconnections in order to identify options and anticipate their likely impacts. He or she is also able to reason systematically about the implications of the different options for the people and places that may be affected. In this way, geo-literacy provides the basis for making sound decisions.

Geo-Education: Building Geo-Literacy

Unfortunately, the components of geo-literacy are neither widely-taught nor well-taught in American schools. One reason is that geo-literacy does not fit neatly into the organizational structure of our schools. Some components of geo-literacy are spread across the science and social studies curriculum, others are not included anywhere in the curriculum. Because geo-literacy cuts across traditional categories in our educational system, we have adopted another new term, *geo-education*, to describe instruction that builds geo-literacy. To strengthen geo-literacy instruction in schools, we must change both what we teach and how we teach it. In other words, we must establish a coherent and effective system of geo-education.

Where components of geo-literacy are included in today's curriculum, they do not receive the attention they need to build geo-literacy. Major components of geo-literacy are part of earth science, environmental science, and ecology. However, students receive much less instruction in these areas of science than others, and these subjects are often taught by teachers who lack adequate preparation. Components of geo-literacy are taught across all of the social studies disciplines, particularly in geography. However, social studies has been marginalized in schools since the passing of No Child Left Behind, and geography teaching was in a decades-long decline even before then. Even when geography and other social studies subjects are taught in American schools, there is typically a disproportionate focus on facts and knowledge with very little attention paid to reasoning.

First, building geo-literacy requires that we increase the amount of instruction in geography, earth and environmental science, and ecology. We must also strengthen the teaching of geo-literacy components across all of the subjects in the science, social studies, and technology curricula. Finally, we must change the nature of instruction across these subjects to focus on reasoning about interactions, interconnections, and implications.

Of course, schools are not the only place where people learn. When you look at the way that people become geo-literate today, you see out-of-school experiences playing a large role in many cases. People who understand the world in terms of interacting systems and interconnected places often report that they were first exposed to that view outside of the formal educational system. Many geo-literate individuals also say that they learned to reason geographically in out-of-school programs like scouting and 4-H, from mentors, or on the job. A well-rounded system of geo-education will include opportunities for young people to have out-of-school learning experiences in institutional settings, such as museums and after-school programs, and in casual settings—in the community, with family, and with peers.



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