



Developing a Framework for Assessing Environmental Literacy: Executive Summary

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EXECUTIVE SUMMARY

At no other time in Earth's history have humans had as great an impact on the planet's systems. Disagreements about how best to approach the issues raised by the interactions between humans and Earth's life-support systems will continue to challenge social and political systems, and it is clear that only an environmentally literate public will be able to find workable, evidence-based solutions for these challenges.

In the United States, government agencies, professional organizations, education institutions, and corporations have demonstrated their interest in the enhancement of environmental literacy by investing hundreds of millions of dollars in efforts to achieve that goal. Internationally, the United Nations' Decade of Education for Sustainable Development is nearing an end. To aid in gauging our progress in achieving environmental literacy nationally and internationally, this project has built on recent groundbreaking efforts to conduct large-scale assessments of environmental literacy and facilitate the development of a next generation of national and international assessments.

This document presents a new, comprehensive, research-based description of environmental literacy and applies that work to the creation of a framework for an assessment of environmental literacy that is proposed as an optional component in the Organisation for Economic Co-operation and Development's (OECD) Programme for International Student Assessment (PISA) 2015. This collaborative effort brought together, for the first time, experts in research, assessment, and evaluation in the fields of social studies education, science education, environmental education, and related science and social science fields, who critiqued early drafts, provided references, and suggested revisions.

This document and the analysis on which it rests are intended as a guide for developers of large-scale national and international assessments of environmental literacy who wish to answer the question "to what degree do targeted populations have the knowledge, skills, dispositions, and behaviors to competently make decisions and act on local, regional, national, and global environmental issues?" Together, the supporting material and the PISA framework are designed to provide a systematic means of considering the many decisions that must be made in the design of an assessment for a specific purpose and population, and, as such, may also be of interest to researchers and policymakers.

As researchers and specialists pursue the assessment of environmental literacy, it is imperative that there be sufficient consistency within and across assessments so that comparisons can be made. With this document, we hope to promote such consistency so that professionals working in our fields can accumulate evidence and develop understandings regarding the extent to which environmental literacy exists across countries; is being achieved among learners of different ages within a country; and is influenced by cultural, educational, and political policies and institutions.

Definition of environmental literacy

This document is based on a definition of an environmentally literate person as someone who, both individually and together with others, makes informed decisions concerning the environment; is willing to act on these decisions to improve the well being of

other individuals, societies, and the global environment; and participates in civic life. Those who are environmentally literate possess, to varying degrees:

- the knowledge and understanding of a wide range of environmental concepts, problems, and issues;
- a set of cognitive and affective dispositions;
- a set of cognitive skills and abilities; and
- the appropriate behavioral strategies to apply such knowledge and understanding in order to make sound and effective decisions in a range of environmental contexts.

This definition treats the primary elements of environmental literacy—the cognitive (knowledge and skills), affective, and behavioral components—as both interactive and developmental in nature. That is, individuals develop along a continuum of literacy over time—they are not either environmentally literate or illiterate.

Components of Environmental Literacy

There are four interrelated components of environmental literacy: knowledge, dispositions, competencies, and environmentally responsible behavior, all of which are expressed in particular contexts.

Competencies

Competencies are clusters of skills and abilities that may be called upon and expressed for a specific purpose. Measurement of competencies is the primary objective in large-scale assessments. They include the capacity to:

- Identify environmental issues,
- Ask relevant questions,
- Analyze environmental issues,
- Investigate environmental issues,
- Evaluate and make personal judgments about environmental issues,
- Use evidence and knowledge to defend positions and resolve issues, and
- Create and evaluate plans to resolve environmental issues.

The expression of a competency is influenced by and influences prior knowledge and dispositions.

Knowledge

Environmental literacy entails knowledge of:

- physical and ecological systems;
- social, cultural and political systems;
- environmental issues;
- multiple solutions to environmental issues; and
- citizen participation and action strategies.

Dispositions

Dispositions are important determinants of behaviors related to the environment, both positive and negative. Learners' dispositions toward the environment are thought to influence their willingness to recognize and choose among value perspectives, as well as their motivation to participate in public deliberations about environmental issues. They include:

- sensitivity;
- attitudes, concern, and worldview;
- personal responsibility;
- self-efficacy/locus of control; and
- motivation and intentions.

Environmentally responsible behavior

Competencies, knowledge, and dispositions enable and are expressed as behaviors, and environmentally responsible behavior is the ultimate expression of environmental literacy. It describes the point at which competencies, knowledge, and dispositions are brought to bear within a particular context. Treating behavior as a component of large scale environmental literacy assessments, however, is controversial, in part because it is more difficult to assess than the other components. Measures of behavior tend, for obvious reasons, to rely heavily on self reports, which many researchers view as less reliable than other sorts of measures.

There are several ways of conceptualizing environmentally responsible behavior, and measurement problems are associated with each. Two conceptualizations have been demonstrated to be useful in large-scale assessments and surveys:

- One includes five categories of citizen action: ecomanagement, persuasion, consumer/economic action, political action, and legal action.
- Another identifies four categories: environmental activism, non-activist behaviors in the public sphere, private sphere environmentalism, and other environmentally significant behavior.

A third, newer conceptualization of behavior, described as "action competence," focuses on: critical, integrative thinking as it relates to contextual decisions made as part of citizen participation; the development of personal competence and agency; and collective competence and capacity. A number of publications attest to the interest and attention this work is receiving among environmental education and natural resource researchers, and ways of using it in large scale assessments may be developed in the future.

Context

Environmental issues do not operate in a vacuum, but in a variety of physical, personal, social, and political contexts. In different contexts, people may have different disagreements about and solutions for similar issues. Environmental literacy is also not stagnant over time, but should be thought of as dynamic, changing as personal beliefs, experience, behavioral sophistication, social influences, and environmental issues develop and evolve.

Assessing a complex domain

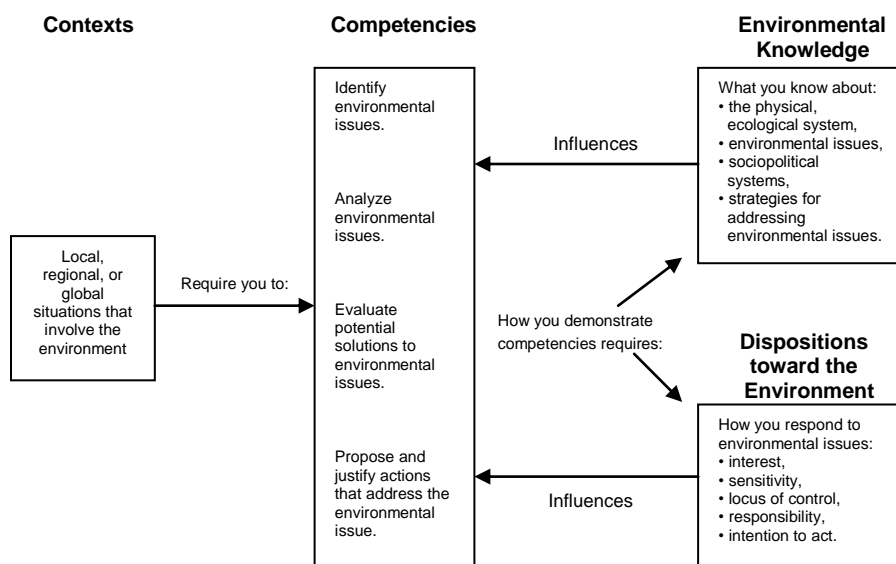
Thinking about environmental literacy will surely continue to evolve, but the progress that has been made in defining it and describing the components that contribute to its development provides a critical support for the development of assessments. Environmental literacy is a very complex domain, and there is simply too much to be assessed in any depth within a single large-scale international or national assessment. Selecting the competencies that are to be the central focus of measurement is essential.

Decisions regarding the specific competencies and related components to include in any one environmental literacy assessment depend on factors such as the particular population and purpose of the assessment. This document describes a series of decisions, based on the definition and supporting research on environmental literacy, that guide the process of assessment design. Collectively, the results of these decisions can take the form of detailed specifications for an assessment tailored to answer particular questions in a particular context.

One example

The work described above has been applied to create a set of design specifications for an assessment of environmental literacy among 15 year-olds as part of PISA in 2015. The result, a proposed framework submitted to OECD in 2011, reflects decisions about each component of the assessment and is depicted in the figure below.

A proposed framework for assessing environmental literacy – PISA 2015



In addition to identifying the components to be assessed, the proposed framework for PISA includes guidance for the creation of tasks and questions that will collect accurate and reliable evidence of learners' competencies, knowledge, and dispositions. It also guides such

other aspects of the assessment's design as length, assessment time, relative scoring weight for each component, response formats, and reporting of results.

The proposed PISA 2015 framework is just one example of how the competencies and other components of this work can be used to design a large-scale assessment and tailor an assessment tool for a particular context. We hope it will be of use in the development of other large-scale assessments of environmental literacy in the future.