

Teaching for the Environment: Integrating Environmental Education into Minnesota's High School Curriculum

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Abstract: In Minnesota, as well as the nation, we are facing a variety of important environmental decisions that will impact our future. To help make these critical decisions, it is important that we improve public levels of environmental literacy; by doing so, we may also see more creative approaches to reducing environmental problems. One way that this could be accomplished is through environmental education, something that many schools aspire to but which is difficult to fund. Environmental education could be taught across a wide variety of subject matter. Working with the Minnesota high school academic standards for science and social studies courses, I show how the concepts that lead to environmental literacy can be incorporated into the existing required curriculum. This is an approach that will make providing environmental education both economical and time efficient. Because some environmental topics are too complex to be incorporated into existing academic standards, I also present plans for a semester-long environmental science course that could be added to the curriculum, completing a student's environmental education.

Findings: Scores on environmental knowledge quizzes were low, causing concern about levels of environmental literacy. Nationwide, only 32% of the sample population was able to achieve a passing score (Figure 1) and in Minnesota, less than 43% of the sample population was able to achieve a passing score (Figure 2).

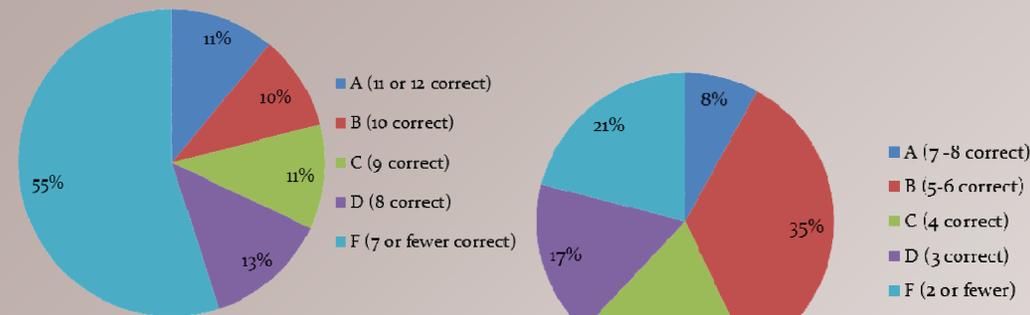


Figure 1. The distribution of scores on the National Environmental Education and Training Foundation environmental knowledge quiz. Nine answers correct or more is considered a passing score.

Figure 2. The distribution of scores on the Minnesota Pollution Control Agency environmental knowledge quiz. Five answers correct or more is considered a passing scores.

Clearly, measures must be taken to improve environmental knowledge so we are more prepared to handle the environmental challenges we will be facing in our future. Fortunately, utilizing the Environmental Literacy: Scope and Sequence concepts, which were developed by more than 42 Minnesota professionals in the field of education, environmental topics can be integrated into academic standards without harming a school's budget. Table 1 provides examples of some possible areas in which environmental literacy concepts could be integrated into the required high school social studies, history, and science standards. Using this method, almost all of the Scope and Sequence concepts could be covered; those left can be covered by an environmental science course.

Table 1. Examples for integrating Environmental Literacy: Scope and Sequence's Concepts into Minnesota's required high school curricula in social studies, history, and science classes.

Environmental Literacy: Scope and Sequence Concepts	Potential Course/ Standard Code	Existing Minnesota Academic Standard or Benchmark	Example for Integration
Abiotic Factors	United States History/ 9.1.4.3.-	There were multiple factors that led to the economic development of English Colonies in North America.	Focusing on the environmental/abiotic factors such as temperature, precipitation, or minerals that led to the success of certain economies.
Innovation and Invention	World History	Students will explain industrial developments and analyze how they brought about urbanization as well as social and environmental change.	Focusing on how innovations in energy production influenced the extensive mining of coal or advancements in agriculture sparked the intensification and expansion of farming.
Population	Life Science/ 9.4.4.1.2	Describe the social, economic and ecological risks and benefits of changing a natural ecosystem as a result of human activity.	Focusing on how changes to an ecosystem could result in a change in the population of a species found in that area. Example: the change in a fish population after the construction of a dam.



Finding ways to cope with climate change is one environmental challenge that humans could face in the next few generations.

Environmental Science Course: Adding an elective environmental science course will allow students to complete their environmental education. The course should cover Scope and Sequence concepts that were not able to be given enough attention in the other classes. These concepts may include climate, resources, products, and waste.

Conclusion: The incorporation of environmental education into Minnesota's required high school social studies, history, and science curricula has the possibility to be an economic and time efficient way to increase environmental knowledge of students. By doing so, we can hope to improve environmental literacy among our state's population. Our citizens will in turn be more adequately prepared for future environmental challenges, and will have the skills to develop innovative solutions.

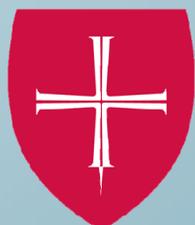
Methods:

Literature Review: I reviewed national and Minnesota environmental literacy reports, environmental education and environmental science curricula, and Minnesota Department of Education standards for science, history, and social studies.

Data Collection: Personal interviews were conducted with teachers from private and public schools in the state of Minnesota.

Data Analysis: Data from national and Minnesota environmental knowledge and energy knowledge quizzes were analyzed. Case studies were analyzed of schools that have had success with the integration of environmental education into their curriculum.

Content Application: Environmental Literacy: Scope and Sequence concepts were linked to Minnesota history, social studies, and science academic standards.



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