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Independent Regulatory
Review Commission

PennState
College of Agricultural Sciences

Comments to the Pennsylvania State Board of Education

Proposed amendments to Chapter 4 Academic Standards and Assessment

Comments submitted per Pennsylvania Bulletin, June 5, 2021
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Summary

The State Board of Education is charged with adopting and revising academic standards for K-12 education. In 2019, the State Board of Education directed Pennsylvania Department of Education to update the science standards. In September 2020, the State Board adopted a proposed regulation with three sets of science standards, one of which is the PA Standards for Integrated Science, Environment, and Ecology.

The standards were developed by a [Content Committee](#), comprised of 60 educators, and an 18-member [Steering Committee](#). Information about the process and proposed draft standards are available on the [PA Science and Technology and Environmental and Ecology Standards website](#).

Pennsylvania has been, and continues to be, a leader in environmental education, and The current “[Environment & Ecology](#)” (E&E) standards are [separate](#) from “[Science & Technology](#)”, and these E&E standards are viewed as an excellent model for other states to emulate. As a result of the current standards and efforts to educate and assist teachers, the ecology and environment standards are currently being used successfully in Pennsylvania classrooms.

This document serves as formal comments of the Penn State College of Agricultural Sciences on the proposed changes to the standards submitted in response to the Pennsylvania Bulletin published June 5, 2021.

Background and Need

The report, “Pennsylvania Agriculture: A Look at the Economic Impact and Future Trends,” states that, “Agriculture and its associated industries provide a \$135.7 billion annual economic impact, representing close to 18% of Pennsylvania’s gross state product. It employs and supports nearly 580,000 people paying wages of \$27 billion.” Yet Agriculture is not even mentioned in the new standards.

Broad-based understanding and problem-solving skills related to the environment, ecology, and agricultural topics clearly results in significant quality of life implications and economic impacts and will be a force for jobs and sustainability for future generations of Pennsylvanians.

Penn State College of Agricultural Sciences is part of a top 25 research institution and has internationally recognized faculty and researchers in the broad scope of environmental and agricultural sciences and agriculture education. With both scientific expertise, and as a leading agricultural college that certifies agricultural teachers, we are disappointed that the College of Agricultural Sciences was not included in the Content Committee or the Steering Committee. Furthermore, our College has an official MOU with DCNR, PDA, and PDE, to work collaboratively with these agencies.

Agriculture is an applied, complex, and comprehensive science. Our college has departments in Animal Science, Plant Science, Food Science, Agricultural and Biological Engineering, Ecosystem Science and Management, Entomology, Plant Pathology and Environmental Microbiology, Veterinary Biomedical Sciences, and Agricultural Economics, Sociology, and Education.

The primary focus of educational standards should be to ensure the accuracy of the specific science. However, science without application is limiting; thus, there is also a critical need for education on the application of the science.

Public interest in agriculture, our food and fiber systems, and the environment is extremely high, particularly due to the breakdowns and vulnerabilities identified in the food and fiber supply chains due to COVID. Most aspects of agriculture, including our College, were classified as “life sustaining” by the Governor during the COVID crisis.

COVID reminded us that the state and national food and fiber supply chains, as well as natural resource management, is critical to the well-being of Pennsylvania citizens. There is a public lack of understanding of the complexity and importance of the food and fiber supply chains that demonstrates the need for public education about agriculture.

Effective educational standards are needed to build agriculture literacy and help bridge the significant divisions between rural and urban populations. This conflict is, in part, due to a lack of understanding of rural America and how natural resources – food, fiber, energy - are produced, processed, and delivered.

Agriculture also addresses significant animal and human health issues, from diseases – including COVID - to nutrition and health, to medicinal food.

Pennsylvania has been, and continues to be, a leader in environmental science. The proposed changes in the Standards for Integrated Science, Environment, and Ecology will have broad implications for agriculture and environmental awareness and literacy.

Agriculture is not mentioned in the proposed standards but is critical to Pennsylvania’s economy and well-being. At a time when agriculture faces incredible challenges, particularly workforce issues, effective educational standards are needed to build agriculture literacy and to recruit students into agriculture disciplines and industries. Student and workforce recruitment and workforce development are the priority for most sectors of the agriculture economy in Pennsylvania.

Current agricultural standards include Pennsylvania specific information, as it is valuable for Pennsylvania students and citizens to understand the uniqueness of Pennsylvania. This is important nation-wide due to the extreme diversity and uniqueness from state to state both in agriculture, natural resources, and environmental issues.

Specific Concerns

Lack of Specificity

By far, the primary concern with the proposed standards is the all-encompassing, generic approach. The proposed standards (2021) are “integrated” and, while integration is important to demonstrate the trans-disciplinary nature of science (STEM, STEMM, etc.) education, the loss of E&E in the process is concerning.

By making the science standards so broad and lacking any specificity they become meaningless and lack practical application. The exclusion of the Environment and Ecology standards as part of the general science standards ignores the complexity and interdisciplinary standards that exist outside of the general sciences.

This requires teachers to focus solely in their areas of expertise rather than potentially more valuable specific information. Pennsylvania is currently a leader in this area and the proposed approach is diametrically the opposite of why we are a leader.

There are performance expectations, disciplinary core ideas, and appropriate learning progressions that are not addressed in the current version of the proposed draft standards, as well as in the Next Generation Science Standards (NGSS) framework, that are actively addressed in the approved (2002) Pennsylvania Academic Standards for Environment and Ecology (E&E).

Specifically, the approved (2002) Pennsylvania Academic Standards for Environment and Ecology include the independent state standards for the below conceptual themes, that teachers are currently required to cover. These are either not included, or are not adequately connected, in the proposed standards and there are no specific performance expectations. This is a significant omission and problem.

- Watersheds and Wetlands
- Renewable and Nonrenewable Resources
- Environmental Health
- Agriculture and Society
- Integrated Pest Management
- Ecosystems and their Interactions
- Threatened/Endangered/ Extinct Species
- Humans and the Environment
- Environmental Laws and Regulations

Pennsylvania's Legal Obligation to Include this Content

The Pennsylvania Environmental Education Act (Act 24 of 1993 (Amended ACT 71 July 9, 2008) /P.L. 105) includes the below requirements that are not met with the proposed changes.

(2) [The State Board of Education has recognized the study of the environment as an essential component of basic education for graduating students. The regulations of the board which pertain to curriculum identify the knowledge and understanding of the environment as one of the goals of a quality education.] **The State Board of Education has adopted environment and ecology curriculum standards identifying the concepts and understanding that students in kindergarten through grade 12 must attain at each level.**

(3) The Department of Education has primary responsibility for formal environmental education within this Commonwealth's schools. A quality education should provide each student with knowledge of natural and human resources, an understanding of geographic environments, knowledge of the interrelationships and interdependence of natural and human systems, the development of environmental problem solving and management skills and knowledge of and appropriate uses of energy.

Recommendation

The proposed integrated standards for grades 6-12 must include Environment, Ecology, and Agriculture as a separate, fifth domain to provide a level of specificity and application that makes the standards meaningful and effective.