Chapter 11
The Importance of Air Pollution as Part of the Environmental Literacy Studies to School Students

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EXECUTIVE SUMMARY

Education about environment, sustainability, and ethically sourced practices became mandatory in school curriculum. Pennsylvania State Board of Education adopted new academic standards for Science, Technology and Engineering, Environmental Literacy, and Sustainability (STEELS). The new academic standards will integrate new disciplines including science, technology, and engineering. Disciplines also include teaching the relationship between humans and the environment. Environmental literacy and sustainability discipline will focus on human social practices, ethical and non-ethical practices, and their impact on the environment. In this chapter, the authors introduce the addition of environmental literacy and sustainability to the Pennsylvania academic curriculum. The topic of air pollution was chosen as the effect of air pollution on the health of school students, absenteeism, and life expectancy are not covered by much scholarly research. Importance of education about air pollution and the knowledge of school students on air pollution sources, air quality regulations, air quality, and its substantial gains to public health are briefly included. In general, this chapter emphasizes the importance of including air quality science in school curriculum. To demonstrate what can be added to the atmospheric

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science classroom, Clean Air Act (CAA) rule issued by the Environmental Protection Agency (EPA) and Corporate Social Responsibility (CSR) of the International Civil Aviation Organization (ICAO) are recommended as examples.

INTRODUCTION

Environmental justice, sustainable practices, climate adaptation planning for current and future generations will be included in the STEELS academic standards, which is planned to be implemented in 2025. The new academic standards aim at developing critical thinking, problem solving, decision making, and communication skills; and encouraging responsible citizenry and community skills among students (Martin, 2024). There will be a three-year implementation window for smooth implementation of the new integrated standards for science, technology & engineering, and environmental literacy & sustainability (Pennsylvania Department of Education, 2022). Air pollution is one of the newly added disciplines to the Pennsylvania new academic standards. Air pollution caused by Air Transport or ground transportation is rarely or briefly discussed in classrooms. Numerous factors cause air pollution including motor vehicles, industrial facilities, aviation industry, forest fires and others. Increase in population is also considered one of the contributors of air pollution because of the harmful practices conducted by humans. Malpractices like cutting down forests, burning fossil fuels and agriculture activities mount every day, which reduce the air quality of our planet (Fowler et al., 2020). School students do not have scientific knowledge about the causes of air pollution and its impact on public health. Schools in many major cities have a higher rate of air pollution, which affects the health of students and increases absenteeism. Climate change causes allergies and long-term exposure to air pollution has been associated with diseases of the heart and lungs, cancers, and other health problems (American Public Health Association, 2017). Although efforts to control air pollution are made by federal, State, regional, and municipal agencies, it is crucial that students learn about those efforts and their impact on the air quality levels.

School students of all levels have limited to no information about how to obtain information on air quality. School students also have minimal information on how to act to air quality hazards and the ethical practices taken to control their harmful effect. As human health is affected by the environment, air pollution is considered one of the main factors leading to severe diseases (Almetwally et al., 2020). Air pollution is defined by the World Health Organization (WHO, 2023) as the contamination of the environment whether indoor or outdoor by any chemical, physical or biological agent that modifies the natural characteristics of the atmosphere. The data of the WHO indicates that air pollution is mainly caused by combustion of