



Global Challenge, Global Collaboration: International Secondary Students Collaboratively Explore Air Quality Issues in Historical Context

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Introduction

Interest in fostering students' global awareness and competencies has grown alongside the development of a global economy. Manifestations of this value can be found in a range of resources and initiatives that have emerged to support K-12 and post-secondary educators:

Center for Collaborative Online International Learning:

COIL facilitates opportunities for faculty and students associated with State University of New York colleges to collaborate with international peers through specially developed online courses¹.

Global Collaboration Network, ISTE

The International Society for Technology Educators (ISTE) has organized a network to support collaboration and exchange of collaboration implementation strategies and opportunities amongst members².

International Baccalaureate Diploma Program:

Many K-12 schools designated as adhering to the International Baccalaureate Diploma Program value opportunities for students to exchange insights and perspectives from geographically diverse peers, in so doing developing a global outlook³.

Project Background

Reduced cost associated with access to computers, collaboration software, and the internet coupled with initiatives that support opportunity for geographically diverse science teachers to connect^{4, 5} invite development of innovative international projects to facilitate meaningful international exchange. Described here is an example of one such project, a collaboration self-germinated at a summer professional workshop between two secondary science teachers (U.S. and China). HAQAST members interested in communicating research to broader audiences, while simultaneously facilitating surfacing of divergent perspectives, may find this project's structure useful.

Project Activities

Canvas⁶ serves as the free, mutually accessible software for grade 11 students in Danbury, Connecticut and Shenzhen, China to access multi-media resources and exchange insights and perspectives. Air quality issues in historical context serves as interdisciplinary topic for students to collaboratively explore. Pairs of students from each county exchange responses to prompts in each of the five modules (fig. 1). Science, policy, engineering design, health, and agricultural impacts are explored through a wide range of resources, including historical artifacts (fig. 2), maps, and archived data⁷.

-  Air Quality: East and West
-  Assessment of Air Quality Improvement Efforts: Analysis of Data
-  Case Study: Efforts to Improve Air Quality in United States
-  Elusive Challenge: Ground Level Ozone
-  Ground Level Ozone: Emerging Research and Innovative Solutions

Fig. 1: Sequence of activities



Fig. 2: Life Magazine (1953)



Fig. 3: Response from Chinese student

The sequence of activities are punctuated with opportunities for students to be surprised -- by the data, history, and partners' insights, and perspectives. The exploration culminates with students' exploration of archived data (1988-2014) from a site in Pennsylvania⁷ (fig 4). Students share inferences and reasonings as to anticipated trend, and investigate factors that may have contributed to negative trend.

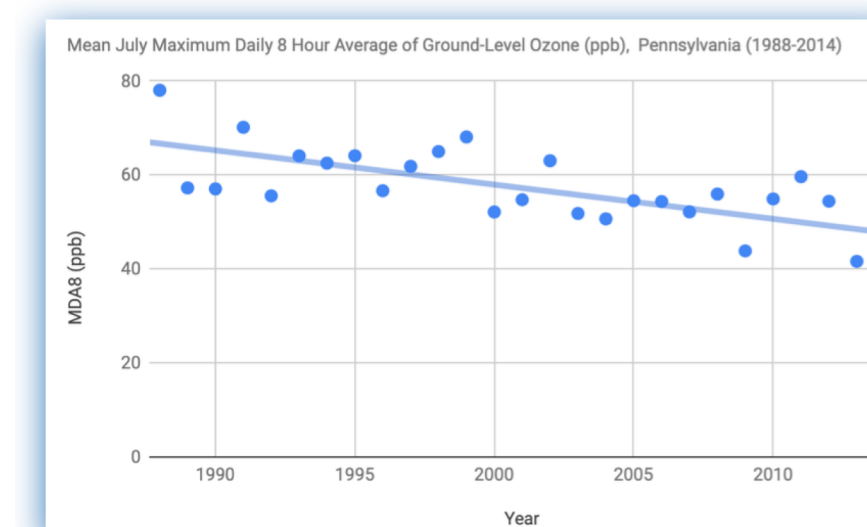


Fig. 4: American student's analysis of site data

Future Global Collaboration Opportunities



Fig. 5: American students measured ozone-sensitive and ozone-tolerant snap bean yields

The project has expanded to include students' investigation about impact of ozone on crop yield and leaf damage through comparing ozone-sensitive vs ozone-tolerant snap beans (fig. 5), resulting in publication at a scientific meeting⁸. A recent call for global citizens to contribute to air quality data collection may further expand opportunities for students to engage and contribute to air quality research⁹.

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