



Friends of Detectives

Science Education Partnership Award

Spring 2001

Friends

Before receiving our Science Education Partnership Award (SEPA) from the National Institutes of Health, we spoke to many people about our idea of creating “Detectives in the Classroom,” a curriculum that would introduce middle school students to the science of epidemiology. Your encouragement, your questions, your criticisms, and your advice were all part of the iterative process that helped shape our proposal and will continue to inform our work.

This periodic newsletter is a way to let “Friends of Detectives” know what we are up to.

Thanks for your help.

Mark Kaelin and Wendy Huebner

The Project

The goal of our 3-year, “Detectives in the Classroom” project is to create a modular, epidemiology-based, curriculum that will increase middle school students’ interests in science, improve their *Science as Inquiry* abilities, and help them meet the *New Jersey Science Standards*.

We will create the curriculum in partnership with an Advisory Board of teachers and health professionals. The middle school teachers, who are members of the Advisory Board will pilot-test the curriculum with their students and we will revise the curriculum based on their experience.

Then the curriculum will be field-tested by a Field-Testing Team consisting of science teachers from twenty middle school members of the New Jersey Network for Educational Renewal. We will randomly assign the twenty schools to be either experimental or control schools. The teachers from the Field-Testing Team’s ten experimental schools will receive “Detectives” training and implement the curriculum in their classes.

We will assess the impact of “Detectives” by making between- group, pre-test/post-test comparisons of students’ interest in science and ability to meet National Science Education Standards. We will revise the curriculum further based on this experience.

Finally, with Centers for Disease Control and Prevention's (CDC) approval, we will create a "Detectives in the Classroom" web site and link it to CDC's EXCITE web site (Excellence in Curriculum Integration through Teaching Epidemiology).

Essential Questions / Enduring Understandings

We are constructing the curriculum based on several principles from the book Understanding by Design by Grant Wiggins and Jay McTighe. (Alexandria, VA: Association for Supervision and Curriculum Development, 1998):

- Identifying essential questions and enduring understandings
- Six facets of understanding
- Backwards design
- Uncovering knowledge as opposed to covering of information

The five essential questions and enduring understandings that will serve as the framework for the "Detectives in the Classroom" modules are:

1. *Why are some people getting sick while others are remaining healthy?*

Clues for formulating causal hypotheses can be found by describing the way a disease is distributed in a population of people, in terms of person, place and time.

2. *Is there an association between the hypothesized cause and the disease?*

Causal hypotheses can be tested by observing exposures and diseases of people as they go about their daily lives. Information from these "natural experiments" can be used to make and compare rates and identify associations.

3. *Is this association causal?*

Causation is only one explanation for finding an association between an exposure and a disease. Because "natural experiments" are flawed, other explanations must also be considered.

4. *What should individuals and society do when preventable causes of disease are found?*

When a causal association has been identified, decisions about possible disease prevention strategies are based on more than the scientific evidence. Given competing values, social, economic, and political factors must also be considered.

5. *Did the disease prevention strategy work?*

The effectiveness of the strategy can be evaluated by making and comparing rates of disease in populations of people who were and were not exposed to the strategy. Costs, trade-offs and alternative strategies must also be considered.

Advisory Board

Four middle school teachers are serving on our Advisory Board; James Brown, science teacher at the 13th Avenue School in Newark, Purcell Dye, health teacher at the Orange Middle School in Orange, Tim Purnell, science teacher at the Renaissance School in Montclair, and Lynn Tarant, science teacher at School 9 in Paterson. (We will introduce you to other members of the Advisory Board later.)



Left to Right: Lynn Tarant, Tim Purnell, and Purcell Dye



Left to Right: James Brown and Wendy Huebner

We have had three Advisory Board meetings since January. During each meeting we present and critique several lessons (investigations), teacher's backgrounds, and rubrics. Unexpectedly, some Advisory Board members have actually implemented the investigations in their classes and collected advice from their students. At present, investigations for understandings 1, 2 and 3 are being revised.

The final "Detectives" curriculum is going to reflect the different skills, expertise, and experiences that each of us brings to the table. And we are hoping that the process will give each one of us the sense of satisfaction that comes from creating something together that no one of us could have done alone.

Proving It

Mark and Wendy attended their first SEPA Project Directors meeting, November 4-7, 2000, and had an opportunity to network with more than 50 SEPA project directors from all over the country. One of the take home points from the meeting was the challenge it will be to demonstrate that "Detectives" did what it set out to do. We have an instrument to measure interest in science and plan to adapt some of New Jersey's standardized test questions to measure students' abilities to meet the *New Jersey Science Standards*. However, at present, we have not identified an instrument to measure *Science as Inquiry* abilities. If you have any suggestions, please let us know. (More about our research design in another newsletter.)

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Mark Kaelin, Project Director
Wendy Huebner, Collaborator
Karen Fox, Graduate Assistant

Montclair State University

Telephone: 973-655-7123, e-mail: kaelinm@mail.montclair.edu

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