

Chapter 9

Inquiry and Technology

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ABSTRACT

This chapter will provide research about the intuitive and developing inquiry reasoning in young children, how their teachers perceive science, and ways technology can play a major role in supporting inquiry investigations. Activities will include intentional applications to support inquiry thinking, development and indicators of children's development of inquiry reasoning to help teachers scaffold thinking, and shared experiences of teachers.

INTRODUCTION: THE NEW EMPHASIS ON SCIENCE IN THE UNITED STATES

It's not that children are little scientists, but that scientists are big children. (Gosnik, 1996)

Concern about science education and science standards in the United States has been driven by the gap in science achievement between groups of students in American schools and worries that American students lag behind their peers in international rankings. During the 20th century, the United States became a world leader in science

and technology education and research and in innovation, and economic indicators demonstrated that the United States offered a high standard of living to its citizens. During the 1990's however, a period in which the United States was known as the world's lone "superpower", a number of indicators suggested that US prosperity was diminishing. (U.S. House of Representatives Committee on Science and Technology, 2007). On October 12, 2005, a legislative committee from the National Academies of Science issued a report entitled *Rising Above the Gathering Storm: Energizing and Employing America for a Brighter Economic Future*. A summary of this report includes.

DOI: 10.4018/978-1-61350-317-1.ch009

Having reviewed trends in the United States and abroad, the committee is deeply concerned that the scientific and technological building blocks critical to our economic leadership are eroding at a time when many other nations are gathering strength. We strongly believe that a worldwide strengthening will benefit the world's economy—particularly in the creation of jobs in countries that are far less well-off than the United States. But we are worried about the future prosperity of the United States. Although many people assume that the United States will always be a world leader in science and technology, this may not continue to be the case inasmuch as great minds and ideas exist throughout the world. We fear the abruptness with which a lead in science and technology can be lost—and the difficulty of recovering a lead once lost, if indeed it can be regained at all. (NAS, 2005 p.3)

The *Gathering Storm* report quickly became influential in promoting a national agenda on innovation and competitiveness. Along with this came yet another wave of science education reform in the United States.

Many teachers in early grades are generalists and might feel uncomfortable teaching science. They often think that they must convey lists of facts - facts that they aren't sure that they themselves know. Actually, in the early grades the most important thing they can do to get the spark of inquiry burning in a young person is to encourage students to ask questions, and the systematically find out the answer to those questions (Giza, in press). Teachers of young children need to develop the spirit of inquiry in children through their instructional approaches. Educators of young children should support science as a child's sense of wonder about the world.

This chapter is co-authored by a graduate student who is working in a laboratory school at an urban university and an early childhood faculty from the university. The two have combined their knowledge and experiences with inquiry,

technology, young children and teacher training to provide insight and ideas to support learning. In this chapter we are going to discuss the evidence for inquiry in play-based programs, what we know about young children and inquiry, the importance of inquiry in science learning and provide teacher recommendations about how inquiry can support and develop through the use of technology. The first section of this chapter will discuss the evidence of inquiry thinking in young children across cultures and relate the indicators of inquiry to technology. The next section will include applications from classrooms and how teachers use technology to support inquiry learning. We will include some of the issues concerning technology and inquiry reasoning with young children and their teachers and some of the solutions through examples from real teachers in classrooms. This chapter will provide our vision of the future use of technology and inquiry reasoning in classrooms for young children and a list of recommended web sites for and from teachers.

Objectives

After reading this chapter the reader should be able to have an understanding of inquiry and technology in context of stages of inquiry and how different forms of technology support the development of inquiry reasoning and Bloom's higher level of thinking. The reader will also have some examples of the issues and beliefs about inquiry and technology and how teachers work to integrate technology into their science instruction.

Along the way the reader will also

- Develop an understanding of the evidence of inquiry in young children
- Develop an understanding of stages of inquiry
- Be able to apply and identify types of technology to support inquiry reasoning

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