

Chapter 22

Does the Method of Schooling Impact Students’ Perceptions of Scientists? Understanding the Complexities that Contribute to Home School Students’ Perceptions of Scientists

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ABSTRACT

In the last 60 years, many researchers have thoroughly examined public school students’ perceptions of scientists (Barman, 1997; Chambers, 1983; Fort & Varney, 1989; Mead & Meraux, 1957; Schibeci & Sorenson, 1983). It has long been established and commonly accepted that many students, for example, perceive scientists in a negative light, as living lonely and isolated lives, being detached from reality and constrained by their work (Barman, 1997; Chambers, 1983; Fort & Varney, 1989; Mead & Meraux, 1957; Schibeci & Sorenson, 1983). Throughout this sixty years there has been an increase in learning about scientists outside these traditional settings public school classroom. Over 1.7 million students (3.4% of the population) in the United States are homeschooled. An investigation of home-schooled students’ and their perceptions of scientists have never been investigated. This chapter compares home-school students in grades two through 10 with public school students in the same grades to determine if any differences exist between the groups relative to their perceptions of scientists.

INTRODUCTION

An assumption among many educators and members of society, although unexamined, is the belief that for children to become leaders, especially

in the field of science, they must have healthy perceptions about who scientists are and what scientists do. In the United States today, there are students in both traditional and non-traditional classrooms, and the expectation is that both groups

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of students, despite differences in instruction and curriculum, will make significant contributions to the global economy.

Every two years, the National Science Board publishes data on trends in science and technology in the United States (National Science Board, 2014). Based on that data, the number of children in this nation who are training to become scientists and engineers is declining, while the number of jobs requiring science and engineering is growing. It is unlikely that students will pursue science careers if their perceptions of scientists do not fit their beliefs about themselves. Students' occupational preferences and career aspirations are strongly linked to their images of particular occupations (Gottfredson, 1981). A deterrent to selecting a career in science often occurs due to the ideas about scientists held by young students--images that may form long before a career is ever considered.

In an attempt to examine students' perceptions of scientists a number of studies have been conducted that ask students to "draw a picture of a scientist" contributed to what is commonly referred to as the stereotypical image of scientists (i.e., Chambers, 1983; Fung, 2002; Maoldomhnaigh & Hunt, 1988; Newton & Newton, 1992; 1998). The issue of validity of the instrument is a difficult one, because it is not known whether the images children draw accurately reflect the scientist in one's imagination. This question, "does the DAT truly reveal the images held by children?" remains difficult to answer at best. Because the validity and sometimes reliability of the DAST was questionable, some skepticism and lower acceptance in the field of science education resulted. It wasn't until a scoring mechanism called the Draw-A-Scientist-Checklist (DAST-C) by Finson, Beaver & Crammond in 1995 that researchers were able to focus on something else besides the initial 'stereotypical image of the scientist' as expectations portrayed in students' drawings. The checklist was created from the common aspects or features found in illustrations from previous studies and were based

initially on the scientists, but not explicitly about what the scientist looked like, where they worked and what they did for work. The DAST-C was an initial attempt to understand what children were telling us. The Checklist was designed to allow researchers to check off those items that had appeared most commonly (hence more stereotypical) in prior research while notations were made for other items such as the magnifying glasses, etc. so that later analysis could account for those drawing components. This attempt to catalog and categorize children's pictures of scientists knowingly had a limited function of what a child may be trying to convey concerning their ideas about scientists.

Many studies have been conducted regarding traditionally schooled students' perceptions of scientists (Barman, 1996, 1997; Chambers, 1983; Finson, Beaver, & Crammond, 1995; Mason, Kahle, & Gardener, 1991). Yet, no such studies exist regarding the home school populations' ideas and perceptions of scientists. The home school population from kindergarten through twelfth-grade is estimated to be growing at a rate of 7 percent to 15 percent annually (Jones & Gloeckner, 2004). Historically, some of the most notable home schoolers were William Penn, John Quincy Adams, Abraham Lincoln, Woodrow Wilson and Franklin D. Roosevelt (Jones & Gloeckner, 2004). However, once compulsory attendance became law, the home school population fell precipitously. In fact, in many states, home schooling was made illegal or viewed with tremendous controversy (Jones & Gloeckner, 2004). In the late 1960s and early 1970s, the idea of home schooling resurfaced in the United States, as a viable option for education. Since then, the number of children who are home schooled has grown dramatically. Today, home schooling is legal in all 50 states and in some circles is considered "trendy." Typically, parents select the home school option for their children based on several criteria. Those include dissatisfaction with the public education system, religious beliefs, or concern that children's indi-

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