

James W. Mauch (2005). *Social Mathematics in the Curriculum of American Civics*. PhD Thesis, Pennsylvania State.

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The following is an extract from Mauch's dissertation.

In both verbal and quantitative literacy, context is a critical component in making sense of what is in front of the reader. This may serve to explain why some mathematicians (Schoenfeld, 2001; Kennedy, 2001) argue that mathematics class is *not* the appropriate place to teach students how mathematics and statistics can be used and abused, largely because the texts, homework, and activities are based so much on abstract concepts and ideas. Civics class can be a unique place to discuss and learn about numbers and statistics because an astonishing number of current and historical social, economic, and political events are based in some form on polls, elections, measurement, tabulation, percentages, ratios, means, averages, statistical modeling – the list continues.

In one way, statistics and information represented numerically may actually present a *greater* danger to the average citizen because numerical information seems to be consumed by the general public with much less skepticism and questioning, *as if numbers are both impartial and effectively and accurately represent the truth*. Understanding numerical information and statistics becomes an imperative of civics education when one considers the explosive growth of information represented numerically or statistically via the national media and other public and private sources of information.

Statistics can serve as another way of making meaning, another way of corroborating or refuting information and conclusions, another way of generating important civic questions, and another way of interpreting and understanding for the student of the social studies. It is another important tool for the twenty-first century American citizen to take in hand.

There are reasons other than providing context for including mathematical and statistical concepts and skills in social studies in general and civics in particular. If one believes that one of the goals of civic education is to equip the nation's students with the skills, knowledge, and content necessary to become an active participant in a representative democracy, then including instruction and activities that enhance student understanding of statistics is fully compatible with, and complimentary to, this notion of teaching students to be active and informed citizens. The choice of the words *compatible* and *complimentary* are purposeful; the idea of teaching students of the social studies to be better consumers of numerical and statistical information is not to suggest that such instruction should come at the expense of teaching more traditional forms of civics and citizenship content and skills. Rather, it is an argument for helping students of the social studies to interpret information, analyze and judge evidence, and make informed decisions, three very traditional skills associated with civic education. The ability to interpret information, to judge and analyze evidence, and to make informed decisions in twenty-first century America requires that students and teachers of the social studies understand that the information we consume via the print, television, and electronic media is increasingly presented to us in mathematical and statistical form. Any level of statistical or mathematical illiteracy on the part of the American citizen leaves him or her at a significant disadvantage when it comes to applying these skills of citizenship. There are also those that make the persuasive argument that learning about statistics and mathematics is an important part of civics because it can serve to open more doors of opportunity for our nation's youth. Social studies educators *can* reach the student turned off by mathematics, algebra, and statistics by examining those same areas within the context of the social studies. Is this not another way of teaching civics, inspiring our nation's youth to open doors of opportunities closed to some for generations?

In *Radical Equations* (2001), civil rights leader Robert Moses draws many comparisons between his work in Mississippi in the 1960s to teaching kids about the importance of math:

Today, I want to argue, the most urgent social issue affecting poor people and people of color is economic access. In today's world, economic access and full citizenship depend crucially on math and

science literacy. I believe that math literacy in urban and rural communities throughout this country is an issue as urgent as the lack of registered Black voters in Mississippi was in 1961. (p. 5)

The argument for including statistics in civics, then, becomes one that is two-fold. First, students of civics need to understand the mathematics and statistics behind so much of the ever-increasing numerical data and information presented to them via the media outlets and private and public sources of information. These fantastic increases in both the amount of information available and ability to access this information is only meaningful and useful to an American citizenry if the information is fully *understood* by the reader. Citizens will need to learn to be comfortable with social, economic, political, legal, personal, professional, and health-related information presented in increasingly statistical formats. Citizens will also need to learn how to use and intelligently consume this information in a variety of “everyday” contexts. Second, embracing the statistical aspects of social data and information equips students with another skill that can potentially provide them with the kinds of access they desperately need: access not only to jobs, but to economic, social, educational, and political opportunities as well.

*Statement Of The Problem* A basic understanding of mathematics and statistics, as well as a knowledge of how numbers and statistics can be used and abused by governmental, public, and private entities are important components of a twenty-first century American education. I argue that such knowledge and understanding is not only critical for the survival and success of the individual, but also critical to the survival and success of our representative democracy. Numbers, mathematical operations, and statistics are increasingly identified as requisite skills for current and future citizens who want to both fully participate in modern American society and protect themselves against those public and private entities that use or misuse numerical and statistical data.

The following chapter will provide the reader with ample historical evidence that suggests that the claims posited in this chapter have evolved from nearly a century of consistent calls for instruction in social mathematics. Given our ever increasing reliance on and exposure to numbers and statistics in modern American society, do civics texts and standards support the notion that ‘ordinary citizens’ need to have a basic knowledge and understanding of social mathematics? This study ultimately will answer the following problem: *How are the calls for social mathematics represented in the current curricula of civics: national standards, state standards, and a nationally marketed civics textbook?*