

Science Career Motivation and Influences

Victoria J. Fawcett-Adams
Shenandoah University

Abstract

This paper investigates questions about the motivation and influence of people who choose a science career, and reflects the Poster being presented at this conference. The study is a Literature Review, the results of two pilot studies, and scholarly feedback conducted in the three years leading up to the Proposal and Dissertation phase of the research.

Keywords: Science, STEM-Increase K-20 Interest and College Enrollment, Career Development, Motivation, Conference Proceedings.

Introduction

Fewer and fewer American students are choosing a science career (Anderson & Okhee, 1993). This trend, reported by the American Astronomical Society (AAS), greatly concerns scientists, policy makers and educational institutions (AAS, 2009). Some groups suggest that the lack of students interested in science is a matter of national security that threatens our future as a leader in defense and space exploration (Bolden, 2009). As a high school science teacher, I am familiar with the lack of enthusiasm students demonstrate in the classroom and how this lethargy, manifests itself within the classroom, ultimately as an “absence” of interest in the career sciences. According to the directors on a panel of eight U.S government agencies at the March 2010 National Science Teachers Convention in Philadelphia, Pennsylvania, there is a dire need for a workforce interested in filling science employment vacancies at all levels (Duncan, 2010).

In the United States, there is a steady decline of students interested in pursuing science careers; however, the need still exists (NSTA, 2010).

This study and literature review explores the nature of the motivation and influences involved in the selection of science careers. In addition, the research asks, “does Science, Technology, Engineering and Math (STEM) as policy, address and answer the many questions that surface in the wake of societal change, as an effectively strong solution to environments that potentially remedy the science career crisis?”

Purpose

The purpose of the study is to understand the motivation of those who selected science careers so that possibly this finding will be useful in guiding others, for example: policymakers, school administrators, business leaders and parents. The research focus will reveal some factors others may use to design strategies, attitudes or programs, which can encourage a shift in the declining entry and anticipated absence of American students seeking employment in the scientific community workforce.

Research Trends

Research trends examined in this paper include: why are students discouraged from choosing a science career, and how long has this hermeneutical “way of thinking” been going on, what or who motivates students to groom themselves for a science career, and does a gender or race bias exist? Preliminary pilot studies indicated a consistently strong bias

Research Trends

towards parental influence, however a string of lived factors also weigh in. Some of these environmental factors include youth experiences, club or organization membership, high school or college classes, teachers, and salary expectations.

There has been a predominance of STEM educational programs that have arisen in the last several years. With that, an abundance of funding allocated from Federal and State organizations, and continued criticism of American student populations due to reportedly low ranking worldwide in NCES, PCES, PISA and other standardized tests. Therefore, it is necessary to examine the connections which determined those policy decisions.

Literature Review

One of the key research findings in relevant literature that motivated or influenced science career selection is the repetitive evidence of maternal influence in exposing children to experiences with a science theme. Role models are believed to make a strong impression as motivational factors when choosing a science career. Notably, adverse impacts can be found with the influence of ineffective teachers (Zinburg, 1971). Zinburg and London's (1983) vintage research parallels today's thinking which suggest a negative trend in students choosing science related careers. Also, the potential for inaccurate reports was implied by Brett (1995) in his description of what is considered a science career. Oddly, some reports on science career choice did not include the health professions, potentially, a substantial argument. This begs the question, how is a science related career defined, and by whom?

What tests and resultant statistics are being used to create policy regarding STEM, and how are they being interpreted? Is the US rank scoring among nations a valid measure of proficiency, or can other measures reflect career choice more accurately?

Methodology

The focus will be to understand the essence of their individual career selection. It may resemble a two-pronged origin of philosophy and sociology. Constructivism, as part of the critical inquiry process, is the major construct (Merriam, 2009) which will illuminate the epistemology of how the study is conducted and understood. The interviewer, using face to face interviews with selected participants, will try to articulate meaning of their career choice, and the interviewer will strive for "thick description" as Geertz (p.28) states, of the times, events and experiences that made that career choice possible Merriam (2009).

Implications for further Study

Finally, this research study will address the issue of an unfilled national workforce in the scientific fields, presumably by the present and also the foreseeable decline of educated students in the sciences. The outcomes produced by critical inquiry will produce recommendations based upon data analysis using qualitative interviews of those people in science related careers.

In a time when the public is skeptical of government spending, and hi-tech global communication is lightening fast, it is our responsibility to be certain, science policy decisions are founded on good research and accurate messages. Research on science career motivation will inform us that as society changes our efforts and capital is well spent.

Acknowledgments

The author wishes to acknowledge and thank John Goss III, Ph.D., Professor & Chair, of Shenandoah University, and the other faculty of the School of Education & Human Development at Shenandoah University for guidance and scholarly leadership.

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Author Information

Victoria J. Fawcett-Adams (Vicki) is a third year, Ed.D. Doctoral Candidate, Organizational Leadership, in the Graduate School of Education at Shenandoah University, Winchester, VA. Research has focused on science career motivation and influences paying attention to STEM program creation, environmental factors and policy decisions. Vicki currently teaches high school science 7-12, in a high-risk acute mental health hospital, employed by Staunton City Schools in Staunton, VA, as part of a State Operated Program. vfawcett08@su.edu