



Millennial College and Career Readiness: Are We Preparing Women for 21st Century Careers?

by

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As our Nation's schools transition from an obsolete traditional educational system into a 21st century learning environment that has a strong emphasis on Science, Technology, Engineering and Math (STEM), educators must take care that females are not precluded from educational success and 21st century career opportunities. Our educational leaders must take note of the employment data that reveal the fact that women currently fill almost 50% of all United States jobs, but less than 25% of these female employees are in STEM-related positions. Of even greater concern is the fact that women have experienced no employment growth in STEM jobs since 2000 (U.S. Department of Commerce, 2011).

The U.S. Department of Statistics' Employment projections in STEM fields appear promising. These data support support encouraging job projections: "Employment in professional, scientific, and technical services are projected to grow by 29 percent, adding about 2.1 million new jobs between 2010 and 2020" (U.S. Occupational Outlook Handbook, 2012).

Presently, many STEM jobs are unfilled. “In an average large metro area, 30 percent of job openings are in STEM fields, but less than 11 percent of the population hold a STEM degree” (Rothwell, 2012). The deficiencies in the total number of STEM-degree job candidates, and the “gender pay gap” all attest to the fact that, “Women who work full-time jobs one year after receiving their diplomas earn 82 cents for every dollar men earn” (American Association of University Women 2009). These data demand that our nation’s schools make a concerted effort to improve the opportunities for females to pursue careers in STEM, since this effort will support pay equity and assure that females are college-prepared and career-ready for the 21st century global job market.

The starting salary for a candidate with a Mechanical Engineer Bachelor of Science degree is \$59,000, in contrast to a starting salary of \$50,000 for a candidate with a bachelor’s degree in Economics (National Association of Colleges and Employer, 2009). Anthony P. Carnevale, director of Georgetown’s Center on Education and the Workforce (CEW) stated: “What society rewards in economic terms has moved away from the softer majors, it’s about how much math you do” (Forbes, 2009). A CEW 2009 survey found that non-technical majors such as humanities and liberal arts, social sciences, law and public policy had unemployment rates between 8.1 percent and 11.1 percent in contrast to jobs in STEM, health care and business, which had unemployment rate of 4 percent.

Educationally rewiring females for careers in STEM must start in elementary and secondary schools. Too often when women apply to post secondary schools, they do not see the relevance in STEM courses and how they relate to their intended career or to their prior learned knowledge and/or skills. Maria Klawe, Ph.D., the President of Harvey Mudd College and a former dean of engineering and professor of computer science at Princeton University believes;

“Women entering college often have little exposure to engineering and computer science, and don’t realize they could apply knowledge from these fields in many ways to pursue rewarding careers that benefit society” (The Chronicle of Higher Education, 2013).

Jo Handelsman, the director at Yale’s Center for Scientific Teaching, believes that “Science, technology, engineering and math (STEM) fields aren’t taught the right way in the United States” (The CT Mirror, 2012). To that end, it is imperative that teachers be given the tools and training to promote STEM courses by shoring up teacher education preparation programs. Klawe (2013) counters, “We have found that broadening our introductory computer-science course from a class framed as a learning to program to one framed as a computational problem-solving approaches across multiple fields, while still covering the same concepts has sparked enthusiasm among both *female* and male students”.

Capturing the young female’s interest in STEM learning should begin at home. Complex learning activities can be encouraged through constructive play, science investigative kits and computer learning activities that are focused on problem solving through math application. For example, instead of a “doll house”, parents can invite female children to build a house using virtual basic CAD programs and Lego construction kits. Science kits can be used to understand the chemistry of hair through analysis of hair samples. Computer activities other than video/music streaming or posting pictures to social sites should be promoted. Furthermore, parents can download applications that will stimulate the female learner to create games by mastering the skill of software programming. Prompting females to step away from traditional hobbies and play activities and inviting them to engage in problem solving and STEM-based creativity, will assist in whetting their enthusiasm to pursue higher thinking skill based STEM courses in school.

A 21st century millennial learner strives for intrinsic rewards. Millennial “gamers” play and master online game skills, and the only acknowledgement of successful skill acquisition is ascension to a higher level that is usually more challenging. There is no external “pay-off” or rewards. Implementing new pedagogical methods and practices are needed to address the new learning motivations of the millennial learner, and to maintain a sustainable interest in learning in STEM subjects for females. Females who are exposed to complex problem solving activities, curricula rigor and relevancy earlier in education will be more apt to pursue college STEM programs with less apprehension. Learning alongside their male peers in troubleshooting activities and allowing “failure” to be an opportunity to learn as opposed to a symbol of inadequate intelligence will increase self-esteem and appropriately align learning and social/emotional well-being for women. In this way college and career resiliency for the female in a 21st century global economy can be achieved.