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Inhibitors and Influencers of Rural Students' Technology-Related Career Choices

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ABSTRACT

At a time when the demand for people with IT skills is at an all-time high, the number of U.S. information systems and computer science students has taken a nose dive. There are two phenomena influencing this trend, namely an overall decline in male enrollment in liberal arts colleges and universities and a decline in enrollment of females in technology-related majors. To remain globally competitive we need strong IT related enrollments. There are 3 objectives for this research: (i) examine major influencers in a student's choice of major; (ii) examine student attitudes toward technology careers; and (iii) examine student understanding of the breadth of technology careers available in the current global business environment. Results of this study will provide an understanding of inhibitors and influencers of major choice of students beginning their post-secondary education and may be helpful to universities in planning recruitment to and promotion of technology-related majors.

Keywords

IT Recruitment; Inhibitors and influencers of career choice; student attitudes toward technology; technology careers

INTRODUCTION

During the late 1980s and early 1990s, Silicon Valley and "dot.coms" were growing exponentially. With a significant increase in the number of well-paying technological jobs, there was a huge push by academicians and concerned women's groups to get more girls and women involved in these career paths. Briefly, technological gender equity issues moved to the front burner and women's numbers in these fields grew. However, around the mid 1990s, a growing academic concern emerged that women were beginning to outnumber males at most liberal arts institutions, as well as the dilemma of a large high school dropout rate for boys. The perception began to form that female students were doing okay, while male students were the ones in trouble. This sensitivity to male students' concerns resulted in diminished overall support for technological gender equity issues, which in turn impacted female participation in information technology (IT) fields.

By 2000 the "dot.com" bubble burst. In conjunction with a widespread fear that off shoring initiatives were bleeding the U.S. IT job market dry, there began an increasing misperception by the public at large that there was no career longevity in computer-related fields. This led to fewer students, both male and female, pursuing IT related careers. Nationally, the number of students choosing computer science as a major is 39% lower than in the fall of 2000 (Lohr, 2005). Meanwhile, from Massachusetts to California, boys continued dropping out from high schools at an alarming 15.8% rate per year (Population Reference Bureau, 2005) while male enrollment at liberal arts schools continued to slide. Women today earn 58% of all college degrees granted, including 59% of the master's degrees, according to the National Center for Education Statistics (Shellenbarger, 2005). At Morehead State University (MSU) in Kentucky, 61% of undergraduates and 68% of graduate enrollment were female in 2004-2005 (OIRCA, 2005). However, Kentucky statistics indicate that while more women, in general, were earning degrees, the degrees earned by women are primarily traditional jobs such as nursing and education (Sugarman, 1999). "Gender identities still have power over enrollment choices," (Carlson, 2006, A38). At the University of Kentucky, only 20.8% of the Graduate Computer Science majors are female (Peterson, 2005). Statistics at most engineering and technical schools indicate men are still in the overwhelming majority averaging a ratio of 4:1.

In terms of recruitment issues, when one looks at the intersection of these two trends (fewer women in computer-related majors and fewer males in college), it is not surprising that enrollments in IT majors have plummeted radically. Ironically, at

a time when the demand for people with IT skills is at an all-time high, the number of information systems and computer science students has taken a nose dive. Enrollment in IT-related majors at some universities has experienced a rapid decline dropping by as much as 50% to 80% (McGee, 2005). At Morehead State University, the number of majors in the Information System Department has fallen substantially since 2002.

With such low enrollment numbers, the U.S. is now facing an impending crisis – not producing enough IT knowledge workers to maintain the competitiveness of the nation (Klawe, 2005). Contrary to the widespread fear that off shoring initiatives are destroying the U.S. IT job market, 2006 is shaping up to be a banner year for technology hiring (Hoffman, 2005). According to Horace Bartilow, a University of Kentucky political science professor, “The jobs that are being outsourced from the United States are actually jobs that will allow the U.S. economy to retrain its workers for jobs that are on a higher level of production” (KET, 2004). But with a smaller quantity of enrollment in these majors, many American companies will have to look overseas to fill their IT openings and/or bring foreign workers here on H-1B visas (Kantor, 2005). This is a dilemma, not just in terms of the loss of U.S. jobs, but in the long run the United States will make itself increasingly dependent on foreign technical expertise. In Kentucky, like the rest of the nation, the dilemma rests in closing the education and technological skills gap of workers. We must address this issue or risk becoming a technological backwater.

The crux of the issue is a rising global competition and a fading excitement for the IT field in the U.S. Perhaps with an impending knowledge-worker shortage, and being faced with the rise of Chindia (China and India) as technological competitive contenders, the time has come when the pain of change will be less than the pain of staying the same. Technology has long been the one area in which the United States has held supremacy over other nations. Unfortunately, new trade data from the Commerce Department indicates that this country has lost its edge in technology exports (Dobbs, 2006). To remain globally competitive we need strong IT related enrollment, and a refocused approach to teaching that allows our students to become creative and innovative participants.

INFLUENCE ON CHOICE OF MAJOR

Researchers have found that a lone teacher can have an impact on students' attitudes by providing active encouragement through role models, sincere praise for good work, and explicit advice regarding the value of course work and its relationship to future careers (Mann, 1994). Studies, education experts, university officials, and others cited teacher quality at the kindergarten through 12th grade levels and students' high school preparation in mathematics and science courses as major factors that influence domestic students' decisions about pursuing science, technology, engineering, and math (STEM) degrees and occupations. In addition, university officials, students, and studies identified mentoring as a key factor for women and minorities (GAO, 2005). At the individual one-on-one level, the teacher can offer snippets of conversation that just might tip a kid toward or away from studying a technology or science field (Murphy, 2005).

Although it is generally agreed that educational venues are the most effective way to assure equal opportunities via legal and social mechanisms, it is also agreed that schools are part of a larger societal unit. Therefore, many social, political, and economic agendas will need to come into play when trying to narrow down solutions for improving the current IT enrollment problem. The sea change that is necessary will occur only in concert with better public relations and advertising on the part of industry, corporations, and government.

In this effort, obviously, parents heavily influence students' choices. Part of the reason many students are not pursuing IT related jobs is that many parents, because of the misperception that IT careers have bottomed out, are advising their children to focus on occupations where they become more valued and recognized as they get older and more experienced, such as doctors, lawyers, etc. (Murphy, 2005). To counter this misperception, students must become informed of the professional and financial opportunities that still exist in IT careers. Industry, corporations, and government must be willing to engage in ongoing discussions with teachers, students, parents, and administrators, as well as to support these efforts financially.

PERCEPTIONS OF TECHNOLOGY PEOPLE AND CAREERS

In terms of drawing both males and females to IT careers another area of perception change that is needed is the current portrayal of IT workers “as loners who are more comfortable dealing with computers than people,” (Calleja, 2005, p. 32). Unfortunately for recruitment purposes, many young people do not see IT jobs as being cool – but rather existing in a solitary, antisocial and sedentary world.

The word needs to be spread (perhaps even evangelized) that the IT industry in recent years has undergone transformation so there are myriad opportunities for a wide variety of work styles both computer-centric and interpersonal. Since women in general are more drawn to professions where interpersonal skills play a large part in the career tasks, IT recruiters, teachers,

and counselors, among others need to help students understand that there's an increasing demand from employers for business-technology professionals with customer-facing skills, client-facing skills, and strong communication skills, i.e. for potential employees who are versatile, with multi-tasking abilities and team building skills.

ATTITUDES TOWARDS TECHNOLOGY-RELATED CAREERS

American teenagers live in a world encased by communications technologies; the internet and cell phones. Teachers and counselors, as well as parents, need to see the importance of educating themselves about the technologies teens are using, even incorporating some of them into their own lives. If we wish to attract more students to the IT field, then educators must make teenagers our partners in this endeavor. "They are the innovators whose imaginations we must value. We will not succeed without their vision and energy," (Lynn, 2006, p. 1). Therefore, the way students are engaged in the classroom must change to accommodate the new technologies in their lives.

Recently the U.S. Chamber of Commerce has launched efforts to make science and technology more attractive to teachers and students. "We want more homegrown (IT) professionals so we can keep our technological edge," (Johnson, 2005, p. 73). The group wants the federal government to offer incentives to teachers and students that would make studying and teaching science, math, and technology more attractive. This is especially crucial given that the Bureau of Labor Statistics projects that 8 out of the 10 fastest growing occupations between now and 2010 will be computer related (Calleja, 2005).

Microsoft and the Society for Information Management are also jumping into the effort, teaming up to counter the view that all IT jobs are being outsourced offshore and that IT salaries are shrinking (McGee, 2005). In 2005 the average computer-science grad started at \$50,664, a 3.3% increase from 2004. Information sciences and systems grads posted a 3.6% increase. Graduates in management information systems saw a bigger jump, rising 5% (Murphy, 2005). Sixty-seven percent of IT companies expect their IT salaries to go up 1% to 4% in 2006. Seventeen percent say salaries will rise more than 4% (McGee, 2006, p. 33). More such positive industry focused media must become part of a new public relations campaign to create the perception that there is career longevity in IT related careers. Because even though off shoring is occurring and some computer programming, engineering software development and bookkeeping duties are being sent to Chindia and other countries, there are myriad new high paying IT opportunities for creative and innovative minded individuals who are willing to become multi-disciplined. Hoffman (2005) notes employers are looking for applicants with relationship management skills in conjunction with technology skills and information security skills are very much in demand. "The more you outsource, the more management you need... if you send work offshore, you are obligated to provide a lot more definition of what it is you want," (Chabrow, 2006). Compliance initiatives such as HIPPA in health care and Sarbanes-Oxley in accounting have also created many new positions combining content specific skills with technology skills

RESEARCH QUESTIONS

This research seeks to build an understanding of these issues from the student's perspective. It focuses on three questions:

- i. What are the major influencers in a student's choice of major?
- ii. What are students' attitudes toward technology-related careers?
- iii. What is students' understanding of the breadth of technology-related careers in the current global business environment?

We will look at influencers and inhibitors of choice of major in terms of people, student's self-perceived aptitude in a particular area, and environmental influences such job availability, willingness to relocate, and perceived stability of the job market. We will ascertain whether the student's perception of technology as a social factor influences his or her choice of major. We will also seek to determine if students understand the degree of integration technology has achieved in most career area. In today's digital and integrated business environment, it is nearly impossible to find a job that does require some use and knowledge of technology.

CONCLUSION

At a time when the demand for people with IT skills is at an all-time high, the number of U.S. information systems and computer science students has taken a nose dive because of a fading excitement for such careers. The lack of enthusiasm for U.S. IT enrollment is highly correlated to the misperception there's no career longevity in these fields. Industry, government, and academia all have a duty to cultivate and celebrate the dynamic nature of today's computing career.

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