

Special Issue on

Achieving Diversity in the IT Workforce: Issues & Interventions

Special Issue Editors

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With growing frequency, it seems, external pressures are presenting significant challenges to the IT profession. As information technology (IT) has spread throughout all aspects of personal and work life, so too, has grown an interest in understanding more about those who use and develop IT, as well as those who are affected by it. This, in turn, has led to an increasing interest in the demographics of IT developers and consumers. Thus, at the dawn of the twenty-first century, the challenge of ensuring a supply of appropriately qualified IT personnel is increasingly bound up with issues of diversity. There remain issues of unequal representation in the IT workforce by demographics such as gender and race, for example. In the U.S., the percentage of female IT employees has steadily declined for many years. Numbers of certain racial and ethnic minorities in IT have never been proportional to their numbers in the population. Clearly, there is a need to understand more about societal and institutional structures that might serve as inhibitors to recruitment and retention of women and other under represented groups in the IT workforce. With this greater understanding, more appropriate interventions can be designed and implemented.

A diffuse body of research related to the role of gender, racial and other types of diversity in human interactions with information technology has emerged in recent years. This body of research spans a number of disciplines including information science, information systems, computer science, education, women's studies, gender studies, labor studies, human resource management, and science, technology and society. The purpose of this research is to inform teachers, parents, educators, managers, policy makers and other researchers about such issues related to effective use of information technology and the under representation of certain groups within the IT profession.

As the appetite for IT continues to grow, the IT profession is challenged with meeting the demand to enlarge the IT workforce by recruiting and retaining personnel from historically under-represented groups. Further, as the global economy expands, CIOs are faced with managing a geographically dispersed and culturally disparate IT labor force. As a result of these pressures on the IT profession, new questions arise about the educational and professional development of the IT workforce. A host of research questions emerge: Should there be special recruitment and

retention strategies for historically underrepresented groups in the IT profession? What can be done to recruit and retain women and racial/ethnic minorities in the IT field? What are the management challenges for a multicultural IT workforce? Should diversity only be seen as a social goal or can it also be seen as a resource to be leveraged for competitive advantage?

This special issue of DATABASE includes papers on the theme of computer/IT personnel research on diversity. Earlier versions of these papers were presented at the 2003 Computer Personnel Research Conference in Philadelphia, PA, USA. Following review for inclusion in the conference proceedings, the papers presented in this special issue were peer reviewed.

The topic of diversity in the IT workforce is mirrored in the diversity of specific topics, methods, and levels of analysis found in these articles. These articles focus on a range of issues and perspectives related to the representation of women and certain racial groups. These issues and perspectives are themselves topically diverse and range from consideration of representation in the educational pipeline leading to the IT workforce, to specific examples drawn from the free-wheeling dot com start ups and job training programs, through the cognitions of women IT professionals currently in the workforce. The articles also represent considerable methodological and epistemological diversity. Both quantitative and qualitative approaches are in evidence, as are positivist, interpretive, and critical perspectives. We believe that each research methodology embeds assumptions and values in its selection of phenomenon to illuminate (and those that are left out of consideration). It is, therefore, both important and valuable to examine this topic using a variety of methods so that potential understandings are not inadvertently neglected. Moreover, it is clear that the composition of the workforce is a phenomenon that can be examined at various levels of analysis. It is a phenomenon based on choices made by a great many individuals in selecting professions and deciding periodically whether to remain or move to another field. Those choices however, are not made in a vacuum but with the context of conditions, alternatives, costs/benefits, and consequences that are influenced by employers and organizations, institutions (e.g. labor departments and taxing/ subsidy authorities around the world), and further by the reinforcement of values and conditioning of the greater society at large. These articles are intended to illuminate the interplay of individual, organization, and context in influencing observable outcomes in the domain of IT personnel diversity. Below, we provide an overview of each of the articles in this special issue.

“Let Sisters Speak: Understanding Information Technology from the Standpoint of the ‘Other;” by Lynette Kvasny, reports on an ethnographic study of 15 African American adults who participated in courses offered at a community technology center. In contrast to the considerable body of literature on the marginalization of women with respect to IT, the women in this study felt empowered by IT and viewed IT access and training as part of a strategy for escaping poverty and despair. This contradictory outcome suggests that researchers should consider the additional identities that women embody including race, ethnicity, socioeconomic status and sexual orientation, that shape and are shaped by women’s engagement with IT. Further, discussions of the IT workforce should take into account not only the highly skilled and credentialed IT workers, but should also consider the lower skilled workers of the knowledge economy who use IT. Finally, interventions targeted toward working-class women should go beyond IT training programs oriented toward transfer of IT skills. Interventions are also needed that redress the persistent structural barriers of poverty, spatial isolation, illiteracy, sporadic work, and racial and ethnic discrimination that systematically limit these women’s ability to compete for jobs.

“Is the Information Systems Profession Gendered? Characterization of IS Professionals and IS Careers,” by K.D. Joshi and Nancy L. Schmidt considers the masculine stereotype ascribed to computer science and whether it also extends to the information systems field. This is accomplished by examining the changes in perceptions of college students toward IS professionals and the IS profession as they progress through their course work. Specifically, they were concerned with the image of IS careers that students have upon entering college, and then again after exposure to the IS curriculum. An online survey was administered to business students in an introductory IS course. Those who continued on in the IS major were, subsequently, surveyed over three consecutive semesters regarding their perceptions of the IS field and IS careers. The results reveal the existence of masculine stereotypes in the information systems discipline as well. However, after students are exposed to IS careers, they appear to grasp the unique nature of the discipline. This study suggests that perceptions of the IS field may be adjusted through IS coursework directed to general students.

“Gender, Achievement, and Persistence in an Undergraduate Computer Science Program,” by Sandra Katz, David Allbritton, John Aronis, Christine Wilson and Mary Lou Soffa examined the phenomenon of declining female enrollment in computer science bachelor’s degree programs through a survey

administered prior to and following the presentation of undergraduate computer science courses. Their study investigated factors that predict performance and persistence in an undergraduate CS program. They found that the factors that predict achievement and retention interact in complex, unexpected ways. Gender differences with respect to retention early in the curriculum were found. Male students who earned less than a B in an introductory CS course were more likely to take the next course in the curriculum than were women who earned less than a B. Achievement and retention later in the curriculum was related to a combination of background factors including Scholastic Aptitude Test scores, number of Calculus courses taken before entering the CS program, amount of access to a computer at home, prior computing experience, and having a mentor or role model in high school.

"Barriers Facing Women in the IT Work Force," by Cynthia K. Riemenschneider, Deborah J. Armstrong, Myria W. Allen and Margaret F. Reid, examines the declining participation of women in the IT profession through a study of women working in IT at a Fortune 500 company. This was accomplished by analyzing women's responses about workplace barriers they faced that had influenced their voluntary turnover decisions or those of their female colleagues. The methodology of revealed causal mapping was used to evoke representations of the cognitions surrounding the barriers women face in the IT field. The results reveal that women's turnover was linked to their views of family responsibilities, stresses they face within the workplace, various qualities of their jobs, and the degree of workplace schedule flexibility they possessed. The women's perception of barriers to promotion were linked to these factors.

"Hostile Work Environment.Com: Increasing Participation of Underrepresented Groups, Lessons Learned from the Dot-Com Era," by Andrea Hoplight Tapia reports on three case studies where small IT businesses rose and fell during the Dot-Com era (1996-2001). Using data from these case studies, she develops an argument that the organizational climate of these firms - that was systematically reinforced by the owners and managers -- was gender, racially, ethnically and culturally homogeneous. The hostile work

environment that resulted made it nearly impossible for female employees to be hired and retained. Tapia notes the irony that during a time of a considerable shortage of qualified IT professionals, certain segments of the population were excluded by IT workplace practices that were inhospitable to certain segments of the IT workforce.

We believe that these articles reflect the state of the research on IT workforce diversity as we continue to refine our understanding of the demographic characteristics of IS professionals, how the IT workforce is recruited and retained, and how we can address barriers to equitable representation in the labor force. It is our hope that this set of research work provides an important addition toward understanding issues of diversity in the IT workforce. While these, like most research papers, present serious research questions and present data or evidence in regard to them, we hope that the articles also stimulate further inquiry on a topic with significant economic, equity, and social implications. Given the wide range of levels of analysis and steps in movement through the pipeline from beginning student to senior practitioner, we would expect the on-going discovery of additional issues relevant to understanding IT personnel diversity as well as potential opportunities for interventions on the part of parents, schools, employers, and policy makers. We would be particularly eager to see research that builds on understandings generated through these and similar studies by studying interventions aimed at encouraging increased numbers of women and minority IT workers with consideration for their success and what can be learned from where they fall short. We would welcome action research in this area.

Finally, we want to acknowledge that each of these articles was written by researchers in the USA based on observations of conditions, cultures, and attitudes found there. The reader should generalize carefully to conditions in other countries that may vary substantially or be reasonably similar to those in the USA. Researchers are encouraged to test the reported findings in other locations to test the robustness of these observations as well as provide opportunities for exchange of "best practices."