Unintended Consequences of Definitions of IT Professional

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INTRODUCTION

Attention to women's low participation in information technology is framed in Canada and elsewhere in terms of concern over availability of well-qualified human resources (ITAC & IDC, 2002) as well as equity issues (Applewhite, 2002; Ramsey & McCorduck, 2005).

In most of these discussions, IT Professional is equated with Computer Scientist or Engineer in spite of the evidence that the profession is more diverse. This article suggests that while those directions are worthwhile, the very definition of "information technology professional" framed in the discourse may have unintended consequences which tend to exclude women. Framed by the literatures on gender and institutionalization of professions, this article applies critical discourse analysis to a variety of "texts" concerning the IT profession in Canada as well as available empirical data. Critical discourse analysis focuses on surfacing the political structures which underlie taken for granted assumptions (Fairclough, 1995). We maintain that while it is critically important to continue to attract females to study computer science and engineering, it is equally important to ensure that multiple paths are available and respected and that narrow definitions are not systemic barriers to the participation of women in the IT profession. In addition, more inclusive definitions which broaden the perspective on information technology (and match the reality of the industry) will promote good technology practices.

BACKGROUND

Women and information technology has been the subject of much attention. Although women account for half the Canadian workforce, they represent only around 22% of the IT profession. Much attention has been focused on increasing the number of women studying computer science and engineering programs and their participation in the industry (Applewhite, 2002; Cohoon, 2001). Programs aim at increasing awareness of IT careers, promoting female role models, increasing young girls' participation in math and science, exploring female-friendly pedagogy, offering alternative entry routes, as well as providing mentors and networking opportunities. However the evidence of the long term impacts is uneven (Cukier & Chauncey, 2004).

Scholars (Ramsey & McCorduck, 2005) have begun to probe beyond the barriers to explore issues related to professional identity in the face of systemic stereotyping, dualism, and devaluation. Studies have shown many women articulated an interest in "computing with a purpose" as opposed to "hacking for hacking's sake". There are also issues of perceptions; both male and female respondents lack information about the nature of the work and overwhelmingly perceived it as a masculinized domain; the females mainly saw IT courses as boring and difficult. Females tend to be more interested in the application of technology than "the technical bits" (Grundy, 1996). Computer science programs that place more emphasis on the application of technology in context and a strong emphasis on teamwork, communication, personal growth, and commitment, such as Purdue's EPIC program, attract a substantially higher percentage of women than traditional computer science programs (Jamieson, 2001).

Research shows the tendency to gender type tasks as male or female (Krefting, Berger, & Wallace, 1978), and there is ample research to show that technology work tends to be framed as mens-work (Perry & Greber, 1990). The masculine gender role may become associated with male-dominant contexts and associated behaviors, and values become

institutionalized. The literature also suggests that the proportion of women in a particular context is negatively related to rewards and that men tend to occupy higher status and higher paying jobs and occupations than women do (Konrad, 2004).

The nature of the profession is changing. Denning (2000) has suggested that there are over 40 organized professional groups in computing and information technologies and that interdisciplinary studies are growing. He proposes a redefinition of the profession to include what he terms "IT specific disciplines, IT intensive disciplines, and IT supportive occupations".

This article will explore the intersection of these two notions: (1) that women are more likely to be interested in the application of technology to solve problems than in the "technical" bits and (2) that the IT profession is broader than computer science and engineering. It will also consider (3) the ways in which the institutionalization of the profession itself affects the participation of women.

Industry data show that the shape of the information technology profession in Canada has changed and that the skills it demands are multi-disciplinary. Non-technical and soft skills based positions will be increasingly important. Technical competence will not be sufficient (SHRC, 2003). A survey by the Software Human Resources Council of Canada identifies 27 different segments in the IT workplace (Gunderson, Jacobs, & Vaillancourt, 2005).

MAIN BODY: GENDER IMPLICATIONS OF DEFINING THE IT PROFESSION

- **Proposition 1: The under-representation of women in engineering and computer science disciplines is not an appropriate metric for assessing women's participation in the information systems profession.** Women's absence in computing is not a general phenomenon, but rather women are under-represented in particular forms of computing such as software engineering (Clegg & Trayhurn, 2000; Grundy, 1996). Women account for 15% of electrical engineering, 21% of applied computer science, 49% of business administration, 62% of mass communications, and 73% of library science programs. Where the focus is the application and management of information technology, female participation is close to 33%. These patterns also hold for the gender distribution of faculty. Similar findings have been reported for the United States (Cukier, Devine, & Shortt, 2002).

Studies from industry reinforce the gender imbalance in subsets of IT occupations.

A study from the Canadian Software Human Resources Council (SHRC), based on a National Survey of IT Occupations, used a broader definition of IT occupations, but the patterns were similar.

Table 1. The evolution of the IT profession

IT-Specific Disciplines	IT-Intensive Disciplines	IT-Supportive Occupations
Artificial intelligence	Aerospace engineering	Computer technition
Computer science	Bioinformatics	Help desk technician
Computer engineering	Cognitive science	Professional IT trainer
Computational science	Digital library science	Security specialist
Database engineering	E-commerce	System administrator
Computer graphics	Financial services	Web services designer
Human-computer interaction	Genetic engineering	Web identity designer
Network engineering	Information science	Database administrator
Operating systems	Information systems	
Performance engineering	Public policy and privacy	
Robotics	Instructional design	
Scientific computing	Knowledge engineering	
Software architecture	Management information systems	
Software engineering	Multimedia design	
System security	Telecommunications	
	Transportation	