Gender Differences in Defining Technology

Mari W. Buche
Michigan Technological University, USA

Our understanding of the computing profession strongly influences our approaches to education and research. (Peter Denning, 1991, p. 129)

INTRODUCTION

There is an alarming trend in the information technology (IT) career field: fewer women than in the past are entering the IT educational pipeline (Camp, 1997; Cukier, Shortt, & Devine, 2002; Whitaker, 2000; Woszczynski, Myers & Beise, 2004). Researchers have discovered a number of possible causes for this dearth including lack of female role models (Ahuja, 2002; Trauth, 2002), the "nerd" image (Braham, 1992; Menagh, 1998; Van Brussel, 1992), and family distractions (Ahuja, 2002; Trauth, 2002). With approximately 50% of the general workforce comprised of women in the United States, this statistic is alarming. At the same time, the IT skills shortage is rapidly becoming a global concern (Cukier et al., 2002; Trauth, 2002; Verton, 2004). The message is clear: something radical needs to be done now to attract and retain qualified, talented women to the IT field.

The general understanding of IT can be seen as an obstacle to attracting job candidates. When junior and senior high school students were asked about their perceptions of IT workers, the majority responded with terms like "weird", "nerd", and "geek (Menagh, 1998; Van Brussel, 1992). The derogatory tone is unmistakable since socialization practices of young girls influence their career choices long before they enter universities (Ahuja, 2002). The basic definition of IT learned through industry and government agencies invokes the areas of computer science and engineering (Cukier et al., 2002). The lack of a concise definition of IT precludes development of a deeper understanding of the problem (Woszczynski et al., 2004). In the past, technology workers have been required to possess strong mathematical and technical skills to create algorithms and to program in tedious computer languages (Weinberg, 1971). This practice ignores the multidimensional nature of IT work. Many workers enter the IT field through paths other than computer science or engineering education programs. So, why is the definition of IT so narrowly focused on these two areas?

The purpose of this article is to explore the influence of gender on perceptions of technology. Next, relevant literature from the information systems field is reviewed, followed by a comparison of definitions found in academic articles, textbooks, and practitioner journals. The next section describes the methods and results of a 2004 study on definitions of technology of undergraduate students (Buche, 2005). Themes extracted from their definitions are compared based on gender. Following the results, a first attempt at a gender-sensitive definition is proposed. The article ends with future trends and conclusions for managers and academics.

BACKGROUND

The role of IT professionals has been changing from that of a highly technical programmer (Weinberg, 1971) to a systems analyst, creating solutions to relevant business problems (Humphrey, 1997; Markus & Benjamin 1996, 1997). These job title changes signal continuous enhancement of responsibilities and tasks. The most obvious evolution is the increasing emphasis on problem solving, project management and communication, thereby bridging the gap between business end users and traditional software programmers. The skills required to be successful in these positions are broader than those found in computer science or engineering fields (Lee, Trauth, & Farwell, 1995). In spite of this realization, businesses continue to hire based on technical skill sets (Cukier et al., 2002).

Historically, feminist writings have addressed the definition of technology as being associated with male/masculine values. As Stewart Millar (1998)

G

argues "[I]n contemporary western culture, men are assumed to make the machines, and, if culturally appropriate, women may use them." This argument is grounded in " ... traditional images of masculinity ... [representing] ... the technological 'Progress of Man' from so called barbarism to civilization ..." (p. 15). According to Stewart Millar "[s]uch an identification is reinforced by millennia of historically constituted gender constructions that have come to define our very notions of what it is to be male and female" (p. 15).[1] Technology has been defined and is often understood within this masculine social, cultural, political, and economic context (Wilson, 2004).

Denning divides the multiple areas of IT professionals into three general categories based on functions and expertise (2001, p.16). First, IT-specific disciplines include the highly technical specialties like artificial intelligence and computational science. The second group, IT-intensive disciplines, relies heavily on technology, but has a separate focus (e.g., financial services and telecommunications). The last set, IT-supportive disciplines, includes professional services that assist others in the use of technology (e.g., help desk technicians and system administrators). This conceptualization of technology includes more specialties with female workers (Woszczynski et al., 2004). The next section introduces a number of definitions of technology extracted from the IT literature.

Comparison of Definitions of Technology and Information Technology

A concise definition of the term technology is often absent from academic articles and textbooks in the IT field. Authors either assume that the term in self-explanatory, or they choose to allow the reader to define the term individually, according to background and personal expertise. A comparison between the definitions will reveal some of the sociocultural forces that have helped to shape the IT field and perceptions of potential female IT professionals.

"Whenever we see the word *technology* or *technique*, we automatically think of machines" (Ellul, 1964, p. 3). Ellul divides the terms into two parts: technical operations and technical phenom-

enon. The technical operations contain the view of the process of creating innovation, while the technical phenomenon includes the products created.

Ferré (1988, p. 14) also acknowledges two aspects when defining technology. First, technology is the "*study* of practical arts or (by analogy with bio*logy* or anthropo*logy*) the *science* of the industrial arts." Secondly, technology "refers to the practical arts and products themselves." He discusses technology as both a science and the artifacts or tools produced by innovation.

Cukier, et al., state that "most of the work to date, even by feminists, has accepted the prevailing idea that 'information technology' is virtually synonymous with engineering and computer science" (2002, p. 8).

From current textbooks, information technology is "a term used to refer to a wide variety of items and abilities used in the creation, storage, and dispersal of data and information. Its three main components are computers, communications networks, and know-how," (Senn, 2004, p. 13). The tools definition is obvious in Laudon and Laudon (2004, p. 14) textbook: "Information technology is one of many tools managers use to cope with change." Jessup and Valacich (2003, p. 8) define technology as "any mechanical and/or electrical means to supplement, extend, or replace human, manual operations or devices", and "information technology refers to machine technology that is controlled by or uses information." This definition focuses almost entirely on computer-based solutions.

Although there are similarities between the definitions, the general consensus appears to support technology as existing in engineering and mathematical domains. The next section discusses a study that investigates the influence of gender in the way technology is defined.

METHOD

Over three semesters, the researcher collected definitions of the term "technology" from 197 undergraduate students participating in the core course Information Systems/Information Technology Management (Buche, 2005). The students were primarily business majors in a small, Midwestern university. The students had previously completed a basic

Related Content

Individual Context
(2019). *Gender Inequality and the Potential for Change in Technology Fields (pp. 229-257).*
www.irma-international.org/chapter/individual-context/218465

Age, Gender, and Cognitive Style Differneces in IS Professionals
Michael J. Gallivan (2006). *Encyclopedia of Gender and Information Technology (pp. 19-24).*
www.irma-international.org/chapter/age-gender-cognitive-style-differneces/12709

Gender Differences in Education and Training in the IT Workforce
Pascale Carayon, Peter Hoonakkerand Jen Schoepke (2006). *Encyclopedia of Gender and Information Technology (pp. 535-542).*
www.irma-international.org/chapter/gender-differences-education-training-workforce/12788

Gender and ICT Policies and Programmes in an Indian State
Malathi Subramanianand Anupama Saxena (2006). *Encyclopedia of Gender and Information Technology (pp. 411-416).*
www.irma-international.org/chapter/gender-ict-policies-programmes-indian/12769

ACM's Attention ot Women in IT
Orit Hazzanand Dalit Levy (2006). *Encyclopedia of Gender and Information Technology (pp. 7-12).*
www.irma-international.org/chapter/acm-attention-women/12707