

**Changing Working Conditions and Lifelong Learning in the New Economy  
Case Study Proposal  
Encounters in Cyberspace: Who Counts?**

**Summary of Proposal**

**Overview:**

This case study will focus on women's formal and informal pathways to acquiring skills and knowledge, and accessing jobs in the Informational Technology (IT) Sector. Research has illustrated the persistent and significant gap in participation and wages between men and women in the IT sector with women being only 25% of the IT workforce and earning 20% less than men for comparable work. Women's low participation rates in science, mathematics and engineering education programs, those formal educational programs which are the traditional routes for acquiring jobs in the IT sector, are also well documented, as are the barriers women encounter in these educational contexts. There is much less knowledge in the current research literature regarding women's informal and on-the-job learning processes and the outcome in relation to wages and access to further training once women acquire jobs in the IT sector. The purpose of this case study is to develop a deeper understanding of the informal, nonformal and formal learning pathways women utilize to access careers in the IT sector. This knowledge can contribute to the development of information, programs and policies that have the goal of strengthening women's participation in the IT sector and ensuring that their skills and knowledge are recognized and rewarded.

**Objectives:**

- To document women's informal/nonformal pathways and learning activities related to accessing careers in IT.
- To identify the barriers or obstacles to women's participation in formal IT preparation programs and women's access generally to careers in the IT sector.
- To explore the relationship between formal and informal learning and wages earned by women in the IT sector.
- To examine how the conditions of work in the IT sector attract or discourage women's participation.
- To determine if changes in the condition of the IT sector have created a learning climate that encourages the entry of women into IT careers.
- To determine if learning and work relations among different social groups (e.g. race, class, dis/ability, ethnicity, union/non-union) affect women's access to careers in the IT sector.

**Methodology:**

Both qualitative and quantitative data will be gathered for this case study. The study begins with a thorough literature review informed by a critical multicultural feminist analysis which focuses on the gender gap as well as how race, class and disability factor into women's learning for and access to jobs in the IT sector. Interviews will be conducted with women working in the IT sector, those in school making career decisions, women engaged in informal and on-the-job learning, and poor/low-income women acquiring skills through their involvement with the Internet. Action-oriented focus groups will be conducted to gather further data and provide a space for women to discuss concerns and share strategies for succeeding in the IT sector. An online survey and discussion groups will be developed using existing networks.

## Introduction

The Social Sciences and Humanities Research Council of Canada has initiated a new funding competition called the "Initiatives on the New Economy" program. Dr. David Livingstone (University of Toronto) along with Dr. Pierre Doray (University of Quebec at Montreal) and Dr. John Myles (University of Toronto) are leading a large-scale proposal to this program entitled "Changing Working Conditions and Lifelong Learning in the New Economy". The core research questions of that large-scale proposal are as follows:

- What are the current forms, contents and outcomes of organized educational, training and informal learning activities in Canada's economy?
- What continuities and changes have there been in learning and work relations associated with the 'New Economy'?
- What differences are there in work and learning patterns across different social groups (e.g. occupation, class, gender, generation, ability/disability, ethnicity, regional, union/non-union workplace, sector, etc.)?
- Are there barriers associated with work and learning and how can these barriers be overcome?

The Livingstone, Dory and Myles proposal involves a large national survey on working conditions and lifelong learning as well as a number of case studies that will investigate certain sector, occupations and/or dimensions of the overall research issues. This proposed case study, outlined below, will explore women's formal and informal pathways to accessing, and their experiences as workers in, the Information Technology (IT) Sector.

Currently in Canada there is a shortage of professionals needed to fill jobs in Information Technology. Furthermore, there continues to be a persistent gender-gap in workers in the information technology sector. (AAUWW, 2000; ITAC Canada, 2002). It appears that few women are choosing or accessing IT careers-- at least through the traditional routes of science, mathematics, and engineering. There is some indication, however, that their pathways into those careers differ from traditional formal education routes. Women maybe entering these careers through liberal arts, informal or on-the-job learning rather than through the more traditional routes through the sciences or mathematics (Digital Eve, 2001). In addition, many women move into the IT sector through on-the-job-training or volunteering.

The ITAC study, which looked at 950 qualified IT graduates of Ontario post-secondary and vocational training colleges, and over 400 IT employers, revealed the proportion of men to women is 72:28, closely resembling the overall ratio of 76:24 in the IT industry itself. Moreover, women working in the IT sector continue to earn less than men. According to a 1999 survey by computerjobs.com, women in high tech jobs earn an average of 85% the salaries of men. For example, a male IT consultant earns an average of \$62,000 while a female consultant earns an average of \$57,000 (AAUW, 2000). The ITAC study concludes that: "one solution to the chronic shortage of skilled workers is to do a better job of attracting women into the field" (ITAC, 2002, pp.10).

The AAUW Tech-Savvy study (2000) recognizes that there are broader issues with regard to gender and technology than simply the under-representation of girls in computer science and technology fields. The study reports that women are roughly 20% of IT professionals and make up less than 10% of the recipients of engineering-related bachelor's degrees. In addition, women who enter the IT Sector

through informal or nonformal learning pathways may have experiences that differ from men with professional credentials, a form of discrimination in the profession.

For this case study we intend to examine high tech workers, focusing on women involved in the actual technology side of the industry as well as jobs in the 'knowledge worker' category. Web site development, database design and/or development, and systems administration are jobs done by those working in the technology side of the industry. 'Knowledge workers' are responsible for information management, database mining, Intranet management and communications specialists (de Wolff, 1995). An additional focus of our research will be the experiences of low income and poor women who access and utilize the Internet, their formal and informal learning processes, and what this process means in relation to personal empowerment.

### **Research Purpose & Goals**

The overall purpose of this case study is to develop an understanding of the informal, nonformal, and formal learning pathways women utilize to access careers related to Information Technology in order to develop strategies to close the gender gap and strengthen women's participation in the IT sector. The case study will attempt to identify what areas of the IT sector are attracting women and how women succeed in entering those areas. This exploration of women's alternative and informal pathways to careers in the IT sector will also contribute to the larger debate about how skills and knowledge are utilized and underutilized in the emerging knowledge-based economy. Furthermore, this study will draw attention to the gendered, raced and classed character of skills and knowledge linked to the knowledge-based economy, particularly within the IT sector.

### **Objectives**

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- To examine how the conditions of work in the IT sector attract or discourage women's participation.
- To determine if changes in the condition of the IT sector have created a learning climate that encourages the entry of women into IT careers.
- To determine if learning and work relations among different social groups (e.g. race, class, dis/ability, ethnicity, union/non-union) affect women's access to careers in the IT sector.

### **Scope**

The case study will consist of three areas of investigation: a review of the relevant literature, action-oriented interviews and focus groups, and an online survey. We will also create online discussion forums for women involved in this project. Case study participants will include:

- Women changing careers into the IT sector through alternative informal/nonformal learning pathways.
- Women who are still in school and making career decisions.

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- Women who have successful careers in the IT sector.
- Women entering through alternative pathways who experience discrimination due to the lack of formal credentials.
- Low income/poor women (e.g. welfare recipients and low-waged workers) using the Internet and acquiring IT skills through formal and informal routes

### **Methodology/Key Activities**

Our research methods will gather both qualitative and quantitative data. We will begin with a thorough literature review using an analytical framework derived from gender-based analysis. More particularly, we are approaching this case study from a critical, multicultural feminist perspective that draws attention to issues of gender, race, and class bias in the IT sector, including ability/disability. We will also conduct an analysis of data from Statistics Canada and the Workplace Employment Survey. For the action research component we will use a combination of online discussion forums, focus groups and key informant interviews.

#### 1. Interviews

We will conduct a series of key informant interviews with women according to the different populations listed above. Key informants will be identified using the Internet and the Advocates for Community-based Training and Education for Women (ACTEW) Network, the FUTURES<sup>SMART</sup> Program based at Dixon Hall, and the MicroSkills Community Development Centre. We will also recruit participants through other networks which the research team members are already involved with. Our goal is to conduct a minimum of 30 interviews aiming for a maximum of 50 interviews.

#### 2. Focus groups

We will also organize small focus groups with participants matching the groups described above, utilizing existing networks and programs training women for IT careers. The focus groups will expand on the information gathered from individual interviews and create a space where the participants can discuss the issues and share strategies and information on negotiating various pathways to learning. Participants will be provided with relevant information gathered from the literature review. The purposes of these focus groups are:

- To document and validate their experiences
- To develop a shared critical analysis
- To inform participants of their rights as workers and how to acquire support and funding for their learning/training.

#### 3. Online survey & discussion groups

We will be working collaboratively with groups such as Wired Woman/Technology With Curves, Digital Eve, Web Grrls, and others to help develop and implement an online survey. The survey will be disseminated through ACTEW-L, a listserv that is circulated electronically to over 800 subscribers. We will also invite members of these networks to participate in online discussion forums related to women, in/formal learning and the Internet. The survey will have the potential to collect information related to how women learned to use the Internet, the skills they need to access online information, and the relationship of their Internet use to their work and/or learning activities.

## **Team Members**

Members of this case study research team include advocates and researchers located in community-based organizations which focus on women's access to quality education and training as well as academic partners who have long standing interests in undertaking research regarding women's education, training and work experiences. Members of the research team include:

- ◆ Karen Lior – Executive Director, ACTEW
- ◆ Jen Liptrot – Project Manager, ACTEW
- ◆ Dr. Shauna Butterwick, University of British Columbia, Department of Educational Studies, Adult Education Program

*Dr. Butterwick* will be the academic lead for the project. She will supervise the work of graduate students who will be involved with various aspects of the literature review and data collection. Based on her current work with poor and low-income women in the greater Vancouver area of B.C., *Dr. Butterwick* will also work on recruiting women from these populations to participate in the study. *Karen Lior* will coordinate the online and offline work of the case study. ACTEW will provide Internet resources and space for the online survey and discussion forums. *Jen Liptrot* will act as the facilitator/monitor for the online discussions.

Partner organizations:

The Office Workers Career Centre  
MicroSkills Community Development Centre  
The FUTURES<sup>SMART</sup> Program, Dixon Hall  
Wired Women  
Digital Eve

## **Communication of Results**

We will disseminate the results of the project through the Centre for the Study of Education and Work, the ACTEW Network and other related community networks. A comprehensive monograph of the study will be prepared documenting the methods and results of the study. Articles will be prepared for academic journals such as the Canadian Journal for the Study of Adult Education, Gender and Work, Journal of Education and Work, and online publications such as the ACTEW-L. We will deliver at least two presentations on the project at regional and national conferences

## **Bibliography**

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Margolis, Jane and Allan Fisher. **Unlocking the Clubhouse: Women in Computing**. Cambridge, MA: MIT Press, 2002

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Green, Ellen, and Alison Adam (eds.). **Information, Communication, and Society: Special Issue on Gender and ICTs**, vol. 2, no. 4 (Winter 1999).

Gurak, Laura J. and Lisa Ebeltoft-Kraske (eds.). **The Information Society: Special Issue on The Rhetorics of Gender in Computer-Mediated Communication**, v. 15, no. 3 (1999).

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Harcourt, Wendy (ed.). **Women@Internet: Creating New Cultures in Cyberspace**. London: Zed Books, 1999.

Holeton, Richard (ed.). **Composing Cyberspace: Identity, Community, and Knowledge in the Electronic Age**. Boston: McGraw-Hill, 1998. (Includes a section entitled "Gender Online" with five essays.)

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### Related Web sites

University of Maryland, Baltimore County, Centre for Women in Information Technology,  
<http://www.umbc.edu/cwit/>

The University of Georgia Centre for Continuing Education, Adult Learning and the Internet,  
<http://www.gactr.uga.edu/webid/internet/adultlearners.html>

Digital Eve, <http://www.digitaleve.com/>

Web Grrls, <http://www.webgrrls.com/>

Women in Technology International, <http://www.witi.com/>

Women Into Trades and Technologies National Network, [www.witnn.com](http://www.witnn.com)