

## **Intuiting, Socializing and Playing Around: Women's Stories of Informal Learning in the Information Technology Field**

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Keywords: Gender, Lifelong learning, Work, Technology

**Abstract:** This report is based on a study of the informal and alternative approaches to learning of women who are working in the rapidly expanding and changing IT field. Using their intuition, borrowing and sharing expertise, and through trial and error, study participants describe essential forms of learning often unacknowledged by both workers and employers.

### ***Purpose and Design of the Study***

The information technology (IT) field is one of the key levers shaping our so-called “knowledge-based society” and is an interesting site of inquiry because it exemplifies some contemporary tensions. On the one hand, there is recognition of the value of informal on-the-job learning, all the while employers demand that workers have formal credentials. Furthermore, IT has been touted as a gender-neutral labour market, but it is one where a masculinist orientation to learning and working persists. Studies have illustrated how women who do enter this field do so without an IT-related credential and it is these women's work and learning stories that are the focus on our case study. We are generally interested in how these tensions of gender, learning, and work play out for women in the IT field. This paper explores some of the learning processes used by participants in our study, and focuses particularly on the role of intuition, social relations and “playing around” on the computer. This study is a partnership between academic researchers and a community-based women's agency and is part of a research network of 12 case studies and a national survey exploring the changing working conditions and lifelong learning in the new economy. The network is called WALL (Work and Lifelong Learning) and is funded by the Social Sciences and Humanities Research Council of Canada (SSHRC).

This inquiry draws on feminist research methodology that is concerned with how gender matters to learning in an effort to “...recognize and value the uniqueness of women's learning without tying it to rigid models” (Stalker, 2004, p. 3). We conducted 70 learning and work histories with women living in Vancouver, Victoria, and Toronto, Canada. We sought out women working in diverse occupational niches and job titles, from positions typically associated with the IT field (e.g., network administration, programming and software engineering, and web development and design) to those often excluded from accounts of the field (e.g., technical writing, project management and secretarial). Participants' ages ranged from 24 to 60 years. Most were white women, very few had children, and most had a university degree and had participated in some limited form of IT training. Only one of our participants indicated that she had a disability.

### **Theoretical Framework and Relevant Literature**

In their overview of theories of learning, Fenwick and Tennant (2004) discuss four main perspectives: learning as acquisition of competencies; learning as reflection and the construction of meaning; learning as part of everyday activities of particular communities of practice; and learning as an embodied co-emergent process. Beyond offering different and valuable perspectives on learning, Fenwick and Tennant argue, an outline of these varied approaches also helps clarify how each approach emphasizes practices which can serve particular interests. As they explain, “Theories have material effects on how we see ourselves and others” and “are important from a political rather than a scientific view” (p. 71). We share this concern about whose interests are being served as we explore women’s learning in the IT field and build on other feminist efforts that seek to illuminate the gendered, raced and classes dimensions of the “knowledge economy,” understanding gender (and these other characteristics) as “a type of social relation that is constantly changing, created and recreated in daily interactions as well as on a broader scale through such institutions as school, work and the family” (Hayes & Flannery (2000, p. 4). As Huws (2000) notes, we need to challenge dominant understandings of the knowledge economy that ignore social relations and instead, understand men and women not as homogeneous categories, but workers who “must be studied in their specific situations, where occupational and regional variables play a major role” (p. 345).

Several studies have noted the gendered differences between men and women in their approach to learning and working with IT. Margolis and Fisher’s (2002) study of IT students at Carnegie Mellon University found that male students described an early “magnetic attraction” (p. 16) to computers, and female students although interested in computers, were more likely to watch “from the sidelines” (p. 19) as other people – often older brothers or fathers – used computers. Although Margolis and Fisher found that both women and men spoke about the pleasure of creating something and the value of interaction with others in the process of their IT work, male programmers tended to focus on getting the program to work, whether or not it had any practical application or usefulness. Female participants offered a “counter-narrative” to the stereotype of computer scientists who are narrowly focused on their machines, as they spoke about “their multiple interests and their desire to link computer science to social concerns and caring for people” (p. 54).

Henwood (2000) studied two different approaches to offering introductory, undergraduate courses delivered at two London universities. One course focused on technical and industry-specific needs. The other presented IT as embedded in social, political and cultural contexts, and offered a women-only option which was derided by male students. Regardless of the different approaches, Henwood found that gender differences persisted with male students expressing more self-confidence and being more often credited by faculty with technical expertise regardless of their academic standing. Considered to be programming experts by their instructors, women under-estimated their own capabilities, reiterating the construction of the IT field as a masculine domain. In their UK study of post-secondary IT courses, Clegg, Trayhurn and Johnson (2000) similarly found that women preferred a relational approach to learning which featured peer interaction. The authors propose that these women’s orientations toward IT and learning reflect “a phenomenology, rather than an ideology of computing practice” (p. 143).

Previous research also illustrates a paradoxical situation wherein women’s IT skills and their approaches to learning are both valued and devalued. While Lipsett (2000) argues that women’s “multifaceted competencies, including the communication and social skills required for team and project organization , are becoming strategically more important” (p. 327), Turkle and

Papert (1990) observe that women's pluralistic, non-conventional approaches to problem-solving, which they describe as "bricolage," were devalued. Women's approach contrasts with a more typically masculine, abstract, rule-bound path to problem-solving encouraged in university computer science programs. Women in Turkle and Papert's study described having to hide this approach, feeling outside the cultural norm and pressured to work in a particular way.

Woodfield's (2000) studied a British IT corporation that had a high proportion of women with science degrees. Although women's orientation to "the broader picture" and their collaborative approaches to problem-solving were held up as the preferred model within corporate discourse, male employees were more likely to receive promotions and project management responsibilities. In some ways, women were burdened by their desirable hybrid skills, as additional, but unrewarded, administrative tasks were typically assigned to them.

In addition to studies that explore gendered approaches to learning about IT, the body of literature addressing the formality and informality of learning is helpful in understanding women's learning in the IT field, including how they come to learn about gender politics. Colley, Hodkinson and Malcolm (2003) suggest that rather than seeing formal and informal learning as dichotomous, "it is more sensible to see attributes of informality and formality as present in all learning situations" (p. 8, our emphasis). Researchers should undertake to "identify such attributes, and understand the implications of the interrelationships between them" (Colley et al., p. 8). Foley (2001) adds the additional consideration of "incidental" learning which, like informal learning, is uncredentialed and unstructured, but, unlike informal learning, is not purposeful. It is the unanticipated learning which "has to be uncovered...[because it is] informal, incidental and embedded in other activities" (p. 77). Foley focuses on the political learning which can occur in daily struggles and social relations such as the gender struggles outlined in the previous research.

A third conceptual area of use here is intuition. According to Flyvbjerg (2001), "Intuition is the ability to draw directly on one's own experience – bodily, emotional, intellectual – and to recognize similarities between these experiences and new situations" (p. 21). Dreyfus and Dreyfus' (1988) model examines levels in learning, beginning with novices and moving up to experts. Novices use context-dependent elements and rules, while experts or "virtuosos" approach learning as intuitive, holistic, synchronic – they get a picture of the problem and an action in the same moment. Expert processes are flowing and effortless, not inhibited with analytic deliberations.

### **Findings**

Participants (pseudonyms are used in this discussion) spoke of the role of intuition, building on previous experience and knowledge, the importance of collegial relationships and supportive supervisors, and the ability to learn about software applications and website design by playing on their computers. Consistent with Turkle and Papert's (1990) description of women's tendency to use bricolage, participants outlined a range of experiential learning processes: playing with new software, using online or application tutorials, reading manuals, talking to colleagues and developing mentoring relationships. Returning to the conceptions articulated by Colley et al. (2003), participants' stories describe both intended (but often unstructured) and incidental learning. For Marion, "*I would say I learn something every time I try to solve a problem. I mean it's not every time now because I keep running into the same problems but...I would say informal learning is part of the job.*" Recalling Foley's (2002) thoughts on incidental learning, we also heard participants speak of a more political kind of learning, particularly about the links between gender and IT work and learning. According to Helen, "*You have to be a strong, assertive woman to work in the IT field because you're interacting with men*

*and you're often working with these high-tech guys and you have to be able to get their respect."* Or, as Hannah echoed, *"I think it's a little bit sexist in IT [laughs]. You have to have a thick skin...and if things like that bother you I would probably stay away."* Even as they extolled the opportunities and decent salaries for women in IT, participants often recognized the presence of traditional gender relations in this still developing field.

As Dreyfus and Dreyfus (1988) describe, the importance of intuition was commonly noted, particularly the sense of the acting in the moment without pause for analysis. Shannon, who had completed a computer science degree, spoke of this type of process: *"I have no idea where to start and my body just goes, and, oh, I am in the right – this is exactly what I'm looking for, you know what I mean."* She also used the phrase *"thinking wild"* for the creative approach to problem-solving that she and other participants described. For Leila, *"intuition is what you use when you don't have all the pieces of the puzzle filled in. The other way of thinking or making a decision is trying to get all the pieces of the puzzle and trying to follow each logical step to the point of the decision so you've followed that logical chain. And that's not the way that I think."* This approach to learning builds on concrete experience and "gut feelings," even though by the standards set by abstract, formal problem-solving, it might be dismissed as illogical. Kari describes her ability to 'get' people's meanings and to understand situations without formal assessment: *"I go into this zone. I have a sense of what's going on"*.

Hillary speaks about intuition as *"a shortcut and based on experience ... you may not even know what experience led you to it. Intuition means your brain recognizing something unconsciously before you even do consciously"*. Women also countered that their intuition was a form of logic. For Rosemary, intuition comes from *"human contact and the basic logic of, of how things work, and then being able to use that fundamental logic to make, to make educated guesses"*. She connected such intuitive logic with her computer knowledge acquisition. Other women also considered social interaction as an important source of intuition. Ivory, for example, gets her intuition from her interaction with people. *"I get a feeling that the problem we're discussing is no the real problem and sometimes I can get around that and find out what it is"*.

Maggie spoke about intuition as *"leaving something for a while, sleeping on it, and then the answer pops up"*. Miriam also noted the way intuition was a kind of non-verbal process of thinking: *"[intuition] is pre-verbal instinct that you somehow have to articulate to yourself"*. She also talked about the importance of intuition to her whole life: *"There's no...there isn't a place where it doesn't have some sort of role"*

A few participants were reluctant to characterize themselves and their learning as intuitive. Mindy described her learning strategy as practical and logical. *"Intuitive wouldn't be a word that I would naturally use to describe myself. I am very practical ...to me intuition is kind of getting a gut feel about something. I would definitely say I'm more logical in approach,"* she said.

#### *Some Implications for Research, Practice and Policy*

Theoretically, this study asserts the importance of forms of learning, like intuition, which are so informal that they are often overlooked, understudied and therefore devalued. In terms of practice and policy, this inquiry points to the benefits of policy supporting lifelong, work-related education and training. This policy area recognizes both that workers are increasingly likely to change occupations and need supports for formal and/or informal learning throughout their work lives, and that a field like information technology – with its constant change and development – requires ongoing learning even for workers who remain in the field throughout their careers. The

stories of these women's learning strategies speak to how their so-called "soft skills", such as an ability to listen and interact well with other workers, are significant in relation to not only their every day duties, but in relation to learning how to learn. These women are exemplary 'just-in-time' learners who continuously learn by building on former experiences and knowledge. Their learning stories point to the need for extending the practice of prior learning assessment and recognition (PLAR) beyond formal training contexts into everyday, experiential workplace learning.

The European Technology Assessment Network Expert Working Group on Women and Science (2000) have pressed for commitments to equalizing gender representation on relevant policy-setting bodies, increasing the presence of women in faculty and research positions in science and technology programs, and alleviating gender-related pay inequities. These still developing policy discourses counter a mainstream discourse of the knowledge-based society and lifelong learning, which are portrayed as gender-neutral but, ultimately, help retain strongly gendered notions and practices of technology, learning and work.

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