AMBIVALENT LEARNING: GENDERED AND RACIALIZED BARRIERS TO COMPUTER ACCESS FOR IMMIGRANT GARMENT WORKERS[1]

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Abstract

This paper focuses on the ways in which one group of contingent workers—immigrant garment sewers—engage in computer-related learning activities. Based on our observation of a twelve-hour introductory course we designed, we analyse both the barriers and possibilities of computer learning for this group of women. Specifically, we organize our discussion around three key issues pertaining to their learning: language, curriculum, and space.

Résumé

Cet article se penche sur la manière dont un groupe de couturières immigrantes ont entrepris des activités de formation en informatique. À partir des observations faites dans le cours d'introduction que nous avons conçu et qui était d'une durée de douze heures, nous analysons les entraves et les possibilités offertes à ce groupe de femmes par l'apprentissage informatique. Plus spécifiquement, nous avons regroupé nos commentaires autour de trois facteurs affectant leur apprentissage: la langue, le contenu du cours et l'environnement d'apprentissage.

Introduction: Contingent workers and the Digital Divide

This paper discusses research conducted on a computer literacy course designed for a group of garment sewers who are Chinese immigrant women in Toronto, and looks at the ways in which these women engaged in computer-related learning activities. We explore the learning barriers these workers face in the context of the peripheral position they occupy as immigrant contingent workers. Based on our observation of a twelve-hour introductory course we designed, we analyse both the barriers and possibilities of computer learning for this group of women. Specifically, we organize our discussion around three key issues pertaining to their learning: language, curriculum, and space.

The course arose out of the concern of a working group, Democratizing Workplace Learning (DWL), which is part of the Centre for the Study of Education and Work located at the Ontario Institute for Studies in Education of the University of Toronto (OISE/UT).[2] While we initially came together as a research group, we also wanted to apply our theoretical knowledge to projects that would provide insight into ways in which workers' everyday lives could be enhanced. In our conversations with contingent workers in Toronto, we discovered that one of the central challenges they face is keeping up with technological change, particularly with the internet.

There are three compelling arguments made in the literature which prompted us to design a course through which we could document the barriers to computer-based learning for immigrant garment contingent workers. First, there is now growing evidence that contingent workers in Toronto are a gendered and racialized segment of the labour market. Second, contingent workers have little access to learning opportunities and face significant challenges in crossing the digital divide. And third, even when women do seek training opportunities, these are often racialized and therefore marginalize people of colour.

Statistics suggest that there has been a dramatic growth in contingent work (such as part-time, on-call, casual, temporary, self-employment and contract jobs) in Canada (Krahn, 1995; de Wolff, 2000; Rogers, 2000; Cranford et al, 2003). The term "contingent work," first coined by Freedman

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[2] The DWL Group is dedicated to developing innovated forms of activism and learning amonst contingent workers. It was established in 1999 and is comprised of researchers, community activists, union members and graduate students. For further information, contact contingent@oise.utoronto.ca.

(1985), was used to describe a management strategy for employing workers only when there was an immediate and direct demand for their services (Plovika, 1996; Barker and Christensen, 1998). Other terms used to describe these workers include non-standard workers (Krahn, 1995), flexible labour (Dex and McCulloch, 1997) and precarious employment (Vosko, 2000). As Cranford et al. note (2003), "women, both white women and women of colour are more concentrated in part-time temporary and part-time permanent wage work, compared to men, and these are the more precarious forms of employment" (p. 18; see also de Wolff, 2000 and Ornstein, 2000). Given the organization of contingent work as flexible and dispensable labour, it is often difficult for these workers to obtain on the job training (Plovika and Nardone, 1989). In his book entitled *The Quality of Work: A People Centred Agenda,* Graham Lowe (2000) argues that while the current economic climate demands a workforce that engages in continuous learning so as to develop up-to-date adaptive skills, the rise of non-standard and contingent work structures means that an increasingly large segment of the workforce are restricted from on-the-job learning and training. Furthermore, whereas knowledge about computers and the internet is an integral part of the new social and economic structure (see Castells, 1996), many workers who are part of the contingent workforce are not given the opportunity to gain computer skills as part of their jobs. They represent the antithesis of the model multi-skilled, company-identified worker (Probert, 1999, p. 108) because they are treated as peripheral to the mainstream economy (Morse, 1998: 7). In line with this, Menzies (1996) states that the information highway is the axis of the new economy—this is the "place where work is dispatched to a new global and local labour markets, where work itself is done and supervised, and where value is said to be added" (p. 7). While this shift in the locus of power and control represents an opportunity for some, others are being left behind or are forced to engage in a "mad scramble to keep up" (Menzies, 1996, p. 8). Warschauer (2003) argues that there is a division between those who participate in the control and organization of the digital economy and those who are excluded from it.

Much of the literature on the digital divide focuses on the differential access groups on either side of the divide have to computers and the internet. Data show that race, class and gender play a significant role in structuring the digital divide. As summarized in a recent United Nations Development Program (UNDP) report:

> The typical internet user worldwide is male, under 35 years old, with a
> college education and high income, urban based and English-speaking—

a member of a very elite minority worldwide. The consequence? The network society is creating parallel communication systems: one for those with income, education and—literally—connections, giving plentiful information at low cost and high speed; the other for those without connections, blocked by high barriers of time, cost and uncertainty and dependant on outdated information. (Oct 19, 1999, p. 63)

The digital divide for immigrant contingent workers is maintained not only through the exclusion from training opportunities but also through the racialized nature of learning opportunities themselves. Dei (1995) has demonstrated that black students are pushed into non-academic streams in high school, and experience both overt and subtle racism from teachers and administration. This subtle racism is the most difficult to pinpoint, and affects the self-esteem of students and their belief in their own abilities to succeed. This in turn leads to disengagement from the learning process, and has negative consequences on the futures of these black youth.

In the context of the racialized nature of the digital divide and learning, our study documents the micro processes which structure immigrant women's exclusion from learning about computers and the internet. As immigrant contingent workers, they are very much on their own when it comes to training (de Wolff, 2000), and are aware that they need to gain knowledge and skills in order to meet the challenges of the labour market. Following a brief background of garment workers in Canada, we document the learning process in the course we designed and delivered.

Garment Workers as Contingent Workers[3]

The garment industry is a predominantly Canadian-owned industry and a major employer of immigrants and women. Historically it occupied a secure position in Canadian manufacturing. It is the eighth largest provider of manufacturing jobs, and an important employer of women and immigrants.

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[3] This section relies on another SSHRC-funded project, "Changing Work, Changing Lives: Mapping the Canadian Garment Industry." We are grateful for SSHRC's financial support for our study. For a more complete discussion of changes in the garment industry, see Roxana Ng, "Freedom for Whom? Globalization and Trade from the Standpoint of Garment Workers", *Canadian Woman Studies*, 21/22 (4&1): 74-81, 2002 and Roxana Ng, *Globalization and Garment Workers in Canada: Implications for Social Policy*, Changing Work, Changing Lives: Mapping the Canadian Garment Industry, Working Paper No.3, June, 2002.

The garment workforce is comprised of about 50% immigrants and 76% women (Gunning et al., 2000). While homeworking and sweatshop operations were initially an integral part of the garment trade, unionization brought about significant improvements in workers' wages and benefits. Since the 1980s, however, the garment industry has been undergoing dramatic and contradictory changes. For instance, according to Industry Canada (1996), between 1989 and 1993 the sector experienced a staggering loss of 800 plants and over 33,000 jobs, leading to the notion that it had become a "sunset" industry. Control within the industry shifted from manufacturers to large transnational retail chains. It is in this context that the garment industry witnesses the re-emergence of sweatshops and home-based sewing presently. These changes have led not only to the downward spiral of immigrant garment workers' wages and working conditions, but to increasing instability in employment patterns depending on the ebbs and flows of the production cycle and global competition. Thus, in the late twentieth century, immigrant garment workers, many of them women, are once again marginalized in the workforce. Given their low wages and lack of access to affordable high quality childcare, workers often combine their paid and childcare work, assuming primary responsibility for their children while sewing at home. The garment workers who participated in the computer course were motivated to learn about computers not only by the desire to enhance their work skills, but also to teach their children or monitor their teenagers' activities on the computer.

Ng (2002:21) observes that "at present, there is little education and training available to workers in the garment sector that would enable them to understand their role in Canadian society (as part of citizenship education for instance), and to improve their skills, and enhance productivity and efficiency." These observations, coupled with the expressed needs of garment workers, form the basis of the design of the computer training course described below.

Course Design and Implementation

This basic computer literacy course was designed for one group of contingent workers—Chinese immigrant garment sewers. The request for this course came from the Homeworkers' Association (HWA) in Toronto, whose coordinator was part of the DWL research group. The HWA was formed in 1992 out of a coalition of groups comprised of unions, churches and community-based groups, who were organizing against the re-emergence of sweatshops and home-based sewing as the garment sector restructured and factories downsized or closed. The HWA became a reference point for

displaced factory workers, who were once unionized and who were now sewing for sub-contractors in their own homes. It originally served sewers from the Chinese, South Asian and Spanish-speaking communities. However, as financial resources diminished for paid staff who spoke the languages of garment workers, it became an organization mainly for Chinese speaking sewers, who were the largest group of home-based workers in Toronto. As well, at the time of the course, its membership consisted of home-based and factory workers, as the garment workforce oscillated in relation to cycles of production. We learned from the HWA coordinator that computer literacy was a much desired skill of its members, and that a course in this area could contribute to the learning needs of immigrant garment workers. It would add to the other courses (such as Basic and Intermediate Sewing, English as a Second Language) HWA offered its members.

The purpose of the computer course was two-fold. First, it provided an opportunity for HWA members to use and learn about computers. Second, DWL members wanted to document existing barriers faced by non-English speaking contingent workers in learning about computers. We also wanted to explore how to empower workers through computer learning. We hoped that the lessons learned from this course would form the basis for developing other courses for immigrant workers who are not completely fluent in English.

After much debate, we decided that the course should be bilingual—in English and Cantonese. It consisted of twelve hours of instruction time, three hours per week for four consecutive weeks. It was held on Sunday afternoon, when HWA members usually had the day off work. It was executed by a bilingual instructor fluent in Cantonese and English, and assisted by a bilingual undergraduate student who circulated the room during instruction time to ensure that the learners receive individual attention. Some members of the DWL group also attended and assisted in the classes. However, apart from the HWA coordinator and one Cantonese speaking researcher, our role was mainly observational (see next section).

The curriculum was developed from different basic computer literacy courses we consulted. To tailor the course to the needs of this group of workers, the instructor met with them once before the course to solicit their input before he finalized the curriculum. Even then, changes were made to the initial curriculum as the course progressed. The course consisted of three lessons which included instruction on the basics of the computer, on the internet, and on how to access sites related to garment work, government forms, and workers' rights. After the first session, however, the instructor

incorporated tools and materials needed or requested by the participants. For example, participants requested instruction on how to track internet sites that their children were visiting; this information was added in a subsequent class. The fourth Sunday was devoted to a review of the whole curriculum, questions and answers, and a focus group meeting between the participants, the HWA coordinator and the Cantonese speaking researcher. (The evaluative aspect of the course will be discussed in the next section.)

The course was held in a university computer lab, and included thirteen participants. While we did not gather demographic data on the group, as this was not part of our agreement with the HWA, we did, however, obtain an overall impression of the participants. All of them were middle-aged immigrants to Canada; all were or had been married, a few were separated or divorced. Except for one Mandarin speaker, all spoke fluent Cantonese. Most participants could read some English, but did not speak the language fluently. The Mandarin speaker could understand some Cantonese, and her English was better than other classmates as she was a physician in China. All but two had less than a high school education. Many women had years of sewing experience.

Whereas some feminist theorists have noted that women are often intimidated by technology because of its association with masculinity (see Cockburn, 1986), participants in this course seemed neither apprehensive nor intimidated by the machines. Although there might have been moments of great frustration when things did not work (for instance when a computer scene froze), on the whole they were lively, enthusiastic, curious, attentive and eager to learn. This can, in part, be explained by the fact that the participants were not unfamiliar with technology; they all used sewing machines, including some complex and computerized ones. Following Wacjman (1991), we note that while the course participants might have been socialized to associate computer technology with masculinity, whiteness and youth, they were not totally ignorant of and intimidated by technologies as such.

Women in the course experienced many technological divides/inequalities—gender, racial, labour, digital and educational. We hoped that the learners, through carefully designed graduated modules, would overcome barriers and go beyond basic computer skills to critically discern their marginalized and gendered role in transformed work and employment (Castells 1996). We also hoped that they might become aware of how to use new technology in the service of individual and collective empowerment.

Documenting the Course

In order to document the barriers and possibilities of computer learning for immigrant contingent workers, members of the DWL group, including the HWA coordinator, were present to help with translations (for those members who know Cantonese), make observations, and take notes as part of the documentation process. Note-taking was done by at least two members of the group. Since there was so much going on in the class, it was impossible to attend to every aspect of the course and to the participants' reaction. But we worked out a division of labour that would enable us to maximize the documentation.

Researchers made notes on the instructions, the overall progress of the lessons, conversations with the participants during the break and major problem areas for the participants. We also took notes on body language as a complement to other forms of note-taking. While it could be argued that body language is culturally specific, we found that there were elements about a learning situation that could be generalized. For example, when a student looked puzzled, looked at her neighbours inquiringly, or attempted to get the instructor's attention and failed, it appeared that she needed help. The recorder would draw the situation to the attention of the assistant instructor in addition to noting it. When a segment of the instruction went on for a long time, and some women began to fidget in their chairs and talked to their neighbours, we speculated that they were either beginning to get bored, or were missing what was being communicated. While we recognize that there are gaps in the notes, and possibilities of misrepresentation, different forms of note-taking, as well as discussions with the instructor and assistant instructor throughout the course, enabled us to capture much of the teaching and learning process.

From the beginning, we made it clear to the participants that the course was a pilot project, and that we would be observing the classes both to improve on the course as it proceeded and to document learning barriers. Since our note-taking focused on what transpired in the course, and did not touch on the personal lives of the participants, they had no problem having the observers in the class. Over the weeks, the participants developed a good rapport with the instructor, the assistant instructor, and the researchers, as evidenced by the easy conversations that went on during the tea break.

The researchers/writers are themselves women of colour who have experienced marginalization in spite of their education and class privilege. Basing our work firmly in the traditions of participatory and feminist research, we reject the notion of the disinterested, neutral and objective

observer. Our commitment to making internet use accessible to non-English speaking immigrant women is what guided our observations and analysis. In writing the paper, we began with a simple, thematic analysis of our notes by identifying the key issues that emerged, and grouping these issues into three categories that correspond to the headings used in the sections below. In addition to the notes, we also rely on our knowledge of the literature, our informal conversations with the participants, and our knowledge based on years of working with immigrant women for analytical insights.

Since the course was designed and delivered as a pilot, and participants knew that we were documenting the classes for the two stated purposes, our undertaking was not a typical research project in that the participants were more like co-participants in the project in that their learning served to inform our central question of the barriers and possibilities of computer learning for immigrants who are contingent workers. By documenting their views and their learning, we begin to fill an existing gap in the literature on gender, race and technology by identifying some of the features that constrain as well as promote immigrant women's computer literacy. We caution that the participants' views were by no means homogeneous, nor do we have definitive answers. Our analysis here is the beginning of a longer term undertaking aimed at explicating the enabling and disabling aspects of navigating the information highway by those marginalized by it.

Learning about Computers and the Internet

One of the recurring sentiments expressed by women in the course was about the importance of computers and the internet in their work and family lives. They said that they wanted to gain access to computers and the internet so that they could search for job openings, use email, do their resumés, send their resumés by email (which some employers require), and gain an understanding of what their children were doing on the computer. Some women imagined that they would be able to cut or change sewing patterns on the computer and use translation programs to read documents in English. Yet, many women said that they were overwhelmed by the preliminary details involved in using computers. Throughout the sessions, women were clearly in search of clear and simple answers about what hardware was best, what ISP servers and RAM were, how the telephone and cable were related to the computer, what software was needed, what dotcoms were, and why the screen froze. Out of the thirteen women in the course, eight had computers at home, but only one woman knew how to use it. Women expressed frustration at the number of issues they needed to know about that did not seem directly related to

operating the computer. Many noted that they felt that they did not know where to start.

Language

One of the most significant obstacles faced by this group of women in learning about computers and the internet was *language*. In spite of their high motivation (there was almost full attendance during the four Sundays we ran this course), taking computer courses in English would not have been possible for most, if not all, the women due to their lack of proficiency in English. Burbules and Callister note that the English-centred nature of most online communities represents a form of linguistic imperialism. They argue:

> English speaking users are privileged to have access to more resources and more avenues for interaction than any other users...Participation in online interaction means that users who are not primarily English speakers will be exposed to this language on a regular basis and have many opportunities to practice it. The Internet becomes a medium for teaching the language and promulgating its spread. (Burbules & Callister, 2000, p. 167)

We suggest that this "linguistic imperialism" identified by Burbules and Callister is a form of racism; it is through language that groups of people are included and excluded. In this case, the dominance of English is one way in which immigrant women are marginalized, not only in the workplace, but also in cyberspace.

While noting this bias, we at the same time saw the potential of instructing immigrant women on an English language screen. As the weeks went by, their feeling of being intimidated lessened. Many women said that the internet allowed them to learn and practice their English. At the same time, unlike many ESL classrooms, the internet does not always provide a safe educational space for English learners. Lockard (2000) argues that people's integration into the social space of the internet is dependent on *how* they use the English language. He states that those internet users who communicate in a style of English that does not conform to the norms established by the white middle class will be subjected to "othering" online. This view is supported by Terry Palmer (1994), whose study of online interactions revealed that participants' improper use of English sometimes provoked vicious exchanges of insults. This points to a contradiction in the role of English on the internet. While it enabled the women in our study to practise a second language, it also revealed their identities as members of the non-dominant group. Due to the short duration of the course, this group of women had limited opportunity to engage with others online via the internet,

and did not experience "othering" online (that is, being subjected to criticism from another internet user); nevertheless, they *were* excluded from fully taking advantage of this technology due to their limited knowledge of/in English.

While designing the course, members of DWL had numerous discussions about whether the course should be in Cantonese (the language with which the participants were most familiar), or English (the language in which they need to work in order to use most publicly available computer resources). We decided on a bilingual approach: while instructions would be in Cantonese, the computer resources used would be those regularly available in English. We felt that getting participants used to an English screen is important in the context of the largely English-based provision of public computer resources. If women wanted to use computers in public libraries, for example, they would need to do so in English. In fact, the participants seemed comfortable with the constant negotiation between Cantonese and English—they had no trouble reading simple words in English and recognizing icons, even though they did not speak it fluently. At the same time, they often had problems with spelling, which affected the ease with which they were able to conduct searches on the internet.

Another issue that emerged was a conceptual one. The participants could use their basic English literacy to read most of the information on their screens. But they had difficulty with web sites, links, windows and shortcuts because they did not understand the basic organization of this technology. Therefore, while women could read information, it was very difficult for them to engage in "hyperreading." Burbules and Callister (2000) characterize hyperreading as "not only finding and reading what is on the Internet, but learning to make one's connections in what one finds there, to question the connections (the 'links') that others provide, and to interrogate the silences or absences of the Internet: what is not there (or who is not there)" (p. 33). Without an overall conceptual framework with which to interpret the available information, the group of women participants in this course approached what they read on the internet as information, rather than judging the claims being made in the information provided. Kobayashi and Peake (2000) assert that it can be difficult to uncover biased representations of information. They state that the norms and values of the dominant group are so entrenched in the worldview of our society, that to challenge the mainstream interpretation of information is difficult, and often perceived as an "extreme act" (Kobayashi & Peake, 2000, p. 393). For these women and for others unfamiliar with computer and the internet, recognizing and

interpreting the silences on the web as an indicator of *who* does not have power or whose voices are represented in cyberspace would require more than basic skill and familiarity. Acquiring the level of comfort, knowledge and skill to engage in the kind of hyperreading described by Burbles and Callister would require much more that basic computer training.

The Curriculum

Despite their great interest in computers, eight of the thirteen women had never participated in other computer courses. Among the reasons they gave were: most courses were offered in English; they were not scheduled at times that fit into their work schedules which were often highly unpredictable; and some private courses tended to be expensive. The women said that they were reluctant to take courses in community centres and libraries because they were afraid that they would be left behind in the class due to their lack of proficiency in English. The participants who had taken courses in the past said that they did not feel that they had enough time to practice what they were taught. Often teaching styles were one-sided, with the instructor following set curricula without regard for students' prior knowledge and progress.

In the focus group discussion, the participants said that they did not perceive any of these drawbacks in the present computer course. They were very happy with the fact that the instructor was bilingual, and that they received bilingual lecture notes in English and Chinese. The women in the course also knew one another well; they were in the same occupation and engaged in both work-related and leisure activities with one another through the HWA. These factors allowed them to reduce the anxiety they felt about computers. Indeed, classes were animated: the women were talkative; they exchanged jokes about the tasks they found difficult; and they asked numerous questions. Toward the end of the course, even the women who were quiet at the beginning seemed to be able to voice their opinions, interrupt the instructor when they were stuck, and ask for help from the assistant instructor. Although the course was short and our observations were limited, it is safe to assume that familiarity, safety and bilingual instructions were key to immigrant women's learning about computer and the internet.

However, despite the fact that the classroom was clearly a comfortable space for many of the participants, there were a number of challenges we identified. For example, learning as a group often meant that it was relatively easy for some members of the class to be "left behind." Sometimes, the instructor would not proceed with the curriculum until everyone was at the same step, but this was time consuming and frustrating for some participants. In analysing our notes, we identified three reasons why individuals fell

behind. First, there were technological failures. Sometimes a computer would malfunction or the screen would freeze. While some women knew how to correct the problem or restart their computers, most had to be taught various shut down techniques, which could be time consuming. Continuity with the exercise in which the class was engaged became difficult under these conditions.

A second reason individuals fell behind was due to the participants' varying levels of knowledge and comfort with computers. Some women had used the internet before, while others had never operated a mouse. Many participants were completely unfamiliar with the keyboard and the functions of certain keys such as backspace, tab, and the space bar.

Third, women fell behind because of their different abilities influenced by their familiarity with the computer and their understanding of the conceptual organization of computer technology and the internet. We realized that learning about computers and the internet requires an enormous amount of incremental knowledge. For example, the women needed to know the basics of modems and connections to participate in conversations about AOL, high speed connections, servers and networks. The participants wanted simple answers; yet, frequently the answers seemed to lead to more questions. The exchange below illustrates the incremental knowledge on which their learning depended:

A participant asks why different computers are of such different prices.

Instructor identifies the differences in specifications of two computer advertisements.

Another participant asks what RAM is.

Instructor explains that it is "random access memory" and gives details.

This participant wants to know whether the size of the box of the computer makes a difference and which is best.

Instructor explains.

Another participant asks what the difference between Windows XP and 98. She wants to know which is best.

Instructor explains.

Another participant asks, what is the best computer?

Instructor says it depends on the purpose you want to use it for and what you can afford.

Although this exchange helped a few women in the class, most were mystified and disengaged, and they tuned out after the first few minutes (Fieldnotes,

February 17, 2002). Without basic knowledge it was difficult for them to understand more complex instructions.

In using the internet, these women faced the additional challenge of having limited "access to credibility." Burbules and Callister (2000) distinguish between two features associated with learning about and using the internet: "conditions of access" and "criteria of access:" "[C]onditions of access are the features of a situation that enable or restrict participation in it. Criteria of access are the personal characteristics that people require to actually gain access" (p. 20).

In using the internet, the participants needed to assess the credibility of the information they were reading throughout. For example, the instructor was asked to show participants how to download employment insurance forms. This was the process that the class followed together:

i. Went to a search engine—for example, yahoo.com

ii. Entered "employment insurance"

iii. Got 6,488 results

iv. Sifted through the results, identified "forms and publications" and clicked on this

v. Got a message that Adobe has to be downloaded

vi. Downloaded Adobe, which got saved on the computer

vii. Struggled to find out where on the computer the Adobe file got saved

viii. Ran the file so that it installed

ix. Clicked on "forms and publications" once again

x. After a long wait, the form appeared on some computers. Other computers got error messages.

This exercise took 45 minutes. As it progressed many participants got tired or were discouraged by the process (Fieldnotes, March 3, 2002).

The difficulties described above exemplify the many hidden "cultural codes" and prior knowledge with which successful users of computers and the internet need to be familiar.[4] Despite the instructor's efforts to make the curriculum basic and easy to follow, these hidden codes ran through the training modules. For example, when the instructor realized that the women

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[4] It should not be automatically assumed that these hidden codes are racialized. In the case of the immigrant garment sewers, they were closely related to the issues of language mentioned in the previous section.

were unfamiliar with the use of the mouse, he downloaded a free mouse training exercise from the internet. In this exercise, nine pieces of a jigsaw puzzle were randomly scattered on a screen. The participants were asked to use the mouse to drag pieces into the correct position to complete the picture. As the lesson proceeded and women were having difficulties manipulating the mouse, we realized that this seemingly simple exercise (for us who are familiar with computer use) in fact assumed a high level of comfort as well as physical and manual dexterity with the mouse. Many women had trouble "making sense" of the order in which pieces of the puzzle had to be placed in order to successfully complete the picture. Those who knew that identifying corner pieces would make it easier to fill in the rest of the puzzle found the exercise much simpler. Indeed, Selfe and Selfe (1994) contend that computer interfaces (such as Windows) are themselves embedded in the cultural values of our society. Through these interfaces, "a reality is constituted by and for white middle– and upper–class users to replicate a world that they know and feel comfortable within" (p. 6). For example, features such as the Windows desktop with folders replicate the norms of white collar work and "construct virtual reality…in terms of corporate culture and the values of professionalism" (Selfe and Selfe, 1994, p. 486). In the example of the puzzle exercise described above, women in the course had to engage in two forms of learning at once: learning how to use the mouse, and learning about the teaching tool (the puzzle). We realized that the participants might have found it considerably easier to learn about the mouse if we had developed a tool based on the technologies or cultural norms with which they were already familiar (for example a sewing machine or a pattern of a garment). The lack of such training exercises and tools is symptomatic of the exclusion of the experiences of these and other racialized workers, especially women, in the very design of computers and the internet.

Space

Burbules and Callister (2000) note that the internet constitutes "not only a set of tools, but an *environment*—a space, a cyberspace—in which human interactions happen" (p. 4, emphasis in original). Feminist geographers have argued that women's sense of space is often conceptualized in terms of a lack of control, for example not being able to walk alone at night (Rose, 1993). In our study, we found support for these assertions. The women in the course experienced at least two relatively unfamiliar and therefore not entirely safe spaces: physical space and internet space. First, the university computer room was a physical space that women had little exposure to and experience with. The setup of the room (a typical classroom with computer terminals on

benches (facing forward) facilitated certain types of interactions (such as those with the instructor) while hindering others (such as learning from peers). It was often difficult for women to help one another since this involved moving their chairs or leaving their work space. It was impossible to show colleagues their screens since these were fixed. On the other hand, the setup of the computer room was surprisingly similar to that of a garment factory, where sewing machines are placed on tables all facing one direction. This means that there were elements in the classroom with which the participants could identify readily.

Although the course took place in an alien environment—the university—being able to attend classes in the university was at the same time an empowering experience. During the tea break (which was set up in the lounge of the researchers' home department on a different floor), for example, some of the women approached members of the DWL group and disclosed that they had never set foot on a university campus. They never imagined they would as garment workers. They wanted to see our offices and explore the open spaces. They also said that visiting the university gave them something to share with family members. This sense of wonderment that they could be in this space persisted during the four weeks they spent at OISE. Whereas we take the university space for granted, we realized during the course that this was a contradictory space for non-English speaking immigrant women: it was intimating and empowering at the same time. The issue, then, is how to transform a higher educational institution into a comfortable learning environment for those who are normally excluded from it.

The second space central to computer learning is cyberspace and the technologies needed to access this space. Women's experience of internet space was mediated entirely by the mouse and the keyboard, with which the participants had little experience. Many women felt little control over this space. This was not only because they were relatively unfamiliar with the computer, but also because they did not have the know-how and necessary keyboard and mouse skills to enable them to navigate comfortably in cyberspace. As a result, they often found themselves in sites they had no intention of going to, or were unable to access sites they were trying to get to.

Meanwhile, we could not and must not overlook those "A-HA" moments that the participants did experience when they completed a task successfully, or got onto a site they aimed to access. While we, as course organizers, expected that women would feel most excited at discovering the facilities they could access, such as information about employment insurance or the

activism occurring around garment work, this was not always the case. Many women were particularly excited about learning how to find out about the sites their children had visited at home. They requested additional instruction on this during a tea break, because this was not initially included in the formal curriculum. That day, no one wanted to break for tea, indicating what truly motivated the women to learn about the computer, and what was relevant to them. This was also a revealing moment in our own learning: we discovered the embeddedness of existing gender relations in women's lives as mothers. The motivation for learning was thoroughly tied to their roles, not only as workers, but more profoundly as primary care-givers.

The course was too short for us to document fully aspects of computer use that may/could be empowering to non-English speaking workers. However, we did realize the opportunities for such empowerment are likely to emerge only with a student-directed curriculum and teaching tools that have been developed based on the standpoint of the workers.

Despite the challenges analyzed above, taking the computer course was clearly empowering for all the women involved, as was apparent in the focus group session we conducted with them. The participants said that they were less anxious about computers; they better understood the way the internet works; and they felt more confident about using computers in public sites. One woman even brought her spouse along for the final session so that he, too, could learn about the internet. During this last session, the couple sat at one computer with the woman guiding her husband through what she had learnt. While at first glance this might seem insignificant, this incident points to how this type of learning may challenge existing gender and generational hierarchies in the family, and opens up an area for future research.

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