

An Image of Their Future: How Women in Computer Technology Envision Their Jobs and Lives

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ABSTRACT

Interview data gathered in the context of a large scale study about science and technology students is analyzed in this paper in order to describe how the women entering a computer technology program at the college level in Québec envision their future tasks, working conditions and personal lives, as well as their projects about further schooling. It is found that women foster upward professional, social and financial mobility aspirations when they enter the computer technology program and hold realistic expectations about the working conditions, but have a limited view of the tasks involved by the job. Their time and money investment is predetermined and more often than not they do not consider pursuing further education. For most students, however, the project's planned progress is contradicted soon after entering the program, either by academic problems or by lack of interest for the subjects taught.

Keywords : Computer Science and Technology; Vocational Training; Higher Education; Career Development; Project

INTRODUCTION

While few women choose to study Computer Technology, even fewer are likely to persist and obtain a degree in the field. Notwithstanding their often more promising academic records, only one-fifth of all women who enter the program at the college level in Québec eventually graduate in Computer Technology while about one-third of entering men do¹. Still, so far, efforts to raise the numbers of women in technology have focused on recruiting more of them, as it is done for highly-skilled technicians in general. Québec's ministère de l'Éducation has launched, in the past few years, many campaigns to convince potential applicants – especially young ones – that “the future belongs to those with vocational training”². Women are also targeted with campaigns such as “Chapeau les filles!” that celebrate women preparing for non-traditional careers, as well as specific career development workshops and brochures for high school girls.

It was recently noted, however, that recruitment may not be a panacea: the Conseil de la science et de la technologie, warned government officials that besides getting new students in the scientific and technological fields of study, they should also consider trying to turn students into graduates³. In the

field of Computer Technology, only 15% of students obtain the diploma of the program within the prescribed length (three years). After a total of five years, this figure nearly doubles, but still leaves 12% of students with a degree other than that of Computer Technology, and 60% with no college diploma at all⁴. To the Conseil, this situation is unacceptable:

It is a true waste of personal hopes and collective resources. There are many reasons to believe that these young people effectively had, at the beginning, the capacity and motivation to pursue such a course of study. A system that disheartens so many hopes is a system that must be questioned⁵.

Our research is about the hopes of the students who have entered the Computer Technology program, and what actually happened to each of them, as we have followed them on a longitudinal basis for two years so far. This paper is specifically about the hopes of women and the beliefs they hold about Computer Technology as a field and as a job. We expect this succinct presentation of the findings gathered in fifteen interviews with eight women to allow further thought on how we recruit women into the technologies and how we can help them persevere through program, get a diploma and join the workforce.

THE STUDY

The study from which the data for this paper were extracted is a collaborative effort lead by a team of researchers from different disciplinary and institutional backgrounds. The research includes respondents from three vocational programs (Electronics, Computer Technology and Biotechnology) and one preuniversity program (Natural Sciences). Our presentation will strictly focus on computer technology students.

Since the 1960s, the Québec system of higher education is based on only two types of institutions: general and professional training colleges ("CEGEPs") and universities. Students enter the colleges right after receiving their high-school diploma or later. They can register into preuniversity, two-year programs that prepare them to enter most university programs, or into a vocational training, three-year degree that leads mainly to the job market. Students holding such a diploma can also later register in most university programs if they wish to. The computer technology students we are concerned with are those from the vocational sector of the colleges.

Sample – All respondents that participate in our study do so on a voluntary basis. They were all, at the beginning of the data collection in September 2000, registered in first-semester courses in computer technology programs at three different institutions in two geographical areas. One of the colleges is a private institution, while the other two are public. About half of the students in our sample did not get their high-school diploma in the year preceding the beginning of their computer technology program; many had experienced other institutions and/or programs before they registered into computer technology at their current institution, while others had been active on the labor market before coming back to school.

The researchers only contacted individual students after they had indicated that they agreed to participate in the study during a recruitment campaign. A total of 41 students in computer technology consented to participate in the project, and among those, 8 are women, a figure quite representative of the average number of women in this field. However, we do not pretend to present a statistically significant portrait of computer technology students, but a theoretically sound sample of experiences. From our original sample of eight women, six have left their program and/or institution: one has switched college, two have definitely left the school system, two have

backtracked to the professional level and one has left formal schooling for an indefinite time. Only two of the women in our original sample are still registered in the computer technology program at their original institution and show no sign of leaving for now.

Interview procedure – An interview guide was designed by the team of researchers to allow the meetings with the respondents to be as grounded as possible in their experience. First-semester interviews usually begin with a discussion of the current experience of the student and are followed by discussions of how the student came to the program and what he or she did before. Other subjects of interests, such as work, leisure time and life conditions are then discussed before closing the interview with the student's projects and aspirations on a short-, middle- and long-range perspective. Follow-up interviews, made at the end of the first year in the program or earlier if the student departs, differ from student to student depending on the material collected at the first interview and the respondent's trajectory since the previous meeting or phone contact with the interviewer. All interviews were conducted in French and the cited passages in this paper were translated in order to be true to the students' accounts.

Data analysis – In this paper, data resulting from this large qualitative interview study involving both female and male students will be described in order to show what are the academic, professional and personal aspirations of women students of college computer technology programs in Québec. When possible, their perspective will be compared to that of their male colleagues. While a detailed knowledge of each students' account is necessary to our work, this paper will focus on the description of the projects and aspirations made by the women we met and tackle three main themes: schooling goals, beliefs on the job and on the working conditions, and personal aspirations.

SCHOOLING GOALS

At the time of the first interview, the women we met surprisingly showed little or no interest in the pursuit of further education. Although all of them planned to obtain the degree of their program within three years or less – sometimes against the advise of counselors that predicted it would take them longer – only one clearly wished to go on to the university level. The others, when pressed to talk about the possibility of more schooling, often replied that they would maybe register to a few "short courses" to keep up with the fast evolution of technology, but nothing more. Only

Julianne seriously considers registering in a short program at the undergraduate level in order to complete her training because her precise job goal can't be fulfilled, according to her, with courses in the computer technology field only.

A 24-year-old woman in our sample already holding a preuniversity Humanities degree has in fact chosen the computer technology program over her true passion, anthropology, because she feels that she can't afford to enter a longer course of study:

I would have wanted to go into anthropology, archeology, all that. But... the number of years of schooling... and the money... I tried to take instead something that interested me, I took a chance. I'm interested, not passionate. (...) I didn't even take the time to think about anthropology because I know it takes so much time at the university, just for that... You have to get a Ph.D., or I don't know what. (Barbara)

To a few of these women, in fact, the three years of involvement required by the current program is already a long run and, if available, a shorter program would be chosen immediately. Marguerite admitted, during her second interview, that she shopped around for a short program at a private school but found none close enough to travel to. As we can see, the idea did not fade out of her mind completely:

Interviewer: Would something make you leave the program?

Respondent: Well, I don't know, it would have to be something really terrible because I am really motivated. Unless I had an extraordinary offer, an employer that would be ready to take me with the very little training I already have, but it's nearly impossible. Or if a school would open right by my house and would offer something better. (Marguerite)

Only one female respondent, Iris, a 20-year-old hairdresser, indicated having a bold schooling project involving university-level training. She clearly wishes to obtain a bachelor's degree in Computer Science or Actuarial Science, and maybe also a master's degree. She could have chosen a shorter, preuniversity science program instead of her three-year computer technology program, but preferred to get the college vocational diploma in order to be able to work for a better pay than a hairdresser's during her university years:

Getting a general diploma didn't interest me, the courses and all. The computer technology program gives me a lot of knowledge; I don't think that an employer would have been interested [as much] by the political history of Canada and Québec. (Iris)

Iris also notes that continuing to work during her studies will avoid her getting into debt. Not all students have this opportunity and the financial burden of studying annoys some of them. At our second meeting, Rachel, a 18-year-old Haitian registered at a private institution vents frustration about the loans system and the costs of her education:

The other day they sent me a bill about my loan, it's ridiculous [nervous laughter]: I personally have always been against loans but my mom told me: "You must absolutely do it because I won't be able to back you up all year," so I took them but it's expensive. I didn't know I'd pay all this money to come here, it's ridiculous. (Rachel)

This young woman also resents having to get into more debt to buy a computer for her home, a mandatory acquisition she has not yet fulfilled at the end of the first year, causing herself many problems. Rachel feels heavily pressured by her mother to stay in school but all she wants to do is "take a break". To her, going on to the university is not even a thought, and going on to the next semester, a challenge she's not even sure of wishing to tackle.

The scarcity of further schooling projects in the women studying computer technology seems related to their biography: all of them have already been through other schooling or life experiences before entering their current program, such as other vocational training, work and family. On the other hand, men in our sample were in many cases fresh out of high school and would consider having more schooling years ahead of them. Also, only one of them had children, while three women did and the others almost all planned to start a family after graduation. In such circumstances, it seems that, to the women in our sample at least, pursuing an education is not a matter of leisurely taste but a practical investment of time (and money) often limited by a predetermined ceiling.

BELIEFS ABOUT THE JOB

The women we interviewed carried different images of what it meant to be a technician in the field of computer technology, but the most important diversity held in the level of details of the beliefs and images. A few had a very detailed idea about the job, thanks to the accounts of their life partner (Barbara) or of the clients of their current practice (Iris). However, others had practically no knowledge of the tasks performed by a computer technician but still held a few beliefs about the working conditions.

Among those who had at least the weakest idea on the subject of tasks, there is at least one consensus: everyone wants to work in an office, no one is interested in the workshop, crossing out the industrial computing opportunities. Management computing is definitely the most popular option, with nearly all of the women in our sample wishing to become programmers analysts. This finding is consistent with the fact that many of these women have a background in accountancy or find themselves to be strong in mathematics.

Once it is said that one wishes to become a programmer analyst, little is known about what a programmer analyst *does do*. Tasks such as software installation, web pages design, technical support and troubleshooting, sales, assembly and “programming software for companies” come to the minds, but with very little detail. For the few students who persevered through the first year of coursework, this view has evolved only subtly and now focuses more on the programming tasks, which constituted a large part of the curriculum of the two first semesters. The women in our sample are also aware that some jobs are rather technical, such as assembling computers and debugging, and openly prefer to these aspects those that could bring them in contact with people (colleagues, clients and users). Only one respondent hopes she will have the occasion to work alone as much as possible.

However, some, at the time of the first interview, do *not* wish to become a programmer analyst, or at least are not sure they want to. Barbara, for instance, admits not being passionate about computers and is only giving the experience a chance. Rachel, on her part, feels that she was misled into the program: before registering, she asked college personnel if she would be taught “the basics”, having strictly no experience with computers, and was replied no affirmatively. It turned out quite differently:

When I entered computer technology, I did not believe that I would program – because in fact my program leads to being a programmer analyst – but that’s not what I wanted. I wanted to learn the basics, you know, I did not have word processing classes in high school, I wanted to learn to use Word, Excel, the basics (...). I thought that programming would come at the end of the program but they started right away with programming. I said “There’s something missing here that I didn’t learn first!” but they [the professors] told me I must learn that by myself at home. Ah! Ok... (Rachel)

A third student, Julianne, had an extensive programming experience in high school and is still interested in becoming a programmer analyst, but

would like to combine this goal with her interest for visual design. After only a few weeks in the program, she is already disappointed:

Well, [are my expectations fulfilled?].... Yes and no. I love programming, in fact. But I think they don’t focus enough on the visual aspect of it. For example, I did Visual Basic before. It was programming *and* visual design, we don’t do that here, it’s not in the coursework. Seriously, I really loved that. But... we don’t do it here, that’s too bad. They should add a course on that instead of a psychology class. (Julianne)

These three women, interested enough in computer technology to give the program a chance, left within the first year. It is interesting to notice that the three of them successfully passed all of their courses in the first semester and those still taking program-specific courses were expecting to succeed at most of those of the second semester when we last met them.

BELIEFS ABOUT THE WORKING CONDITIONS

Generally enthusiastic about the professional perspectives offered by the program, most students, and all the women with whom we discussed the subject, believe they will face recruiting drives from businesses while in college and expect to benefit from a workforce shortage. The students also rely on the possibility to land a first job in the field via the credited internships of the program, an opportunity that is highly valued as a way to gain experience and to learn what the job’s tasks are really about.

Women strongly differ from men, however, in their evaluation of the employment conditions they will face when they get their degree. Far more realistic than their male counterparts, women – especially older ones – expect salaries in the 25-30K\$ range, much closer to the 14,80\$ average hourly wage of degree holders (SRAM 2001) than the yearly salary of 40-100K\$ hoped for by most men in our sample. Their professional involvement, however, will also be significantly lower: schedules of 8 to 5 or, “better, 8 to 4” (Justine) are expected, and although one woman would not mind working on night shifts, most of our female respondents wished not to have to work on weekends or at odd hours, usually in order to spend time with their family, actual or planned. Men, on the other hand, more often projected they would have to travel around the world to promote their products or work with clients, and being generously paid to do so. Many of them, in fact, planned getting rich by starting their own firm and selling it to a large company. Such grand entrepreneurship dreams were shared by none of the female respondents, although an older student with four kids, Ida, already a secretary, hoped she

could start a small publicity company with her husband to take advantage of the talents of all members of the family.

PERSONAL PROJECTS

Most of the women we met wish to lead a life where stability is often seen as paramount. Being hired by a large company is the most pleasant scenario to them, far more appealing than working as a consultant or on short term contracts with various clients. Although not all of them reject, as Barbara does, the possibility of climbing the career ladder and holding responsibilities, only one, Iris, voices the project of avoiding the technical support and debugging tasks to hold a management position.

Quite at the opposite of the many men who wish to become professional jet setters, earn 6-digit salaries and buy houses and cars, the women in our sample foster modest projects: living a stable, quiet life. Their goal is clearly one of upward social and financial mobility: they want to lead lives a bit more comfortable than when they started the program, leave their minimum wage jobs as secretaries or waitresses, travel alone or with their families and work decent hours. Family values are important to most of these women: when they do not already have children, they almost all want to have at least one within a few years from their graduation. Those who already have a family of their own, however, do not plan to have more kids than they already do, sometimes because they feel too old to have another child.

CONCLUSION

The perspective held by women studying computer technology at the college level in Québec is well aligned on the contents of the institutional catalogues and of the best-selling guidebooks of career development, which is less often the case of their male classmates' view. Although limited on the subject of tasks, their beliefs are rather realistic when the working conditions are discussed. These women have a strong desire for upward professional, social and financial mobility, but no sky-rocketing expectations. They often seem to have rigorously considered the time and money they can invest in their educational project, which lead almost all of them to decide they would get the college level degree and not pursue further schooling, although they might have wished to at some point. Their personal projects are often traditional ones for women, placing a premium on family issue and

already tackling with the sometimes contradictory requirements of career and family.

Despite their practical sense, most women will leave the field of computer technology soon after entering it. If it is sometimes the case that they were misled about what working with computers is really about, it also seems that in more than a few cases women do not expect the tradeoff between the expected benefits from the degree and the actual steps it takes to get it to be so costly. In our sample, the women who left the program either had to face their failure to fulfill the requirements of the program right from the start or their incapacity to convince themselves that they were truly interested in the contents of their education. Choosing computer technology was a sound decision, future-wise, but at the present time it could not be carried on as planned, stripping the project of its consistency.

While three women in our sample persevere in their program, two of them seem to be walking on a tight rope: they are motivated to continue but admit having, in one case, a fragile academic standing, and in the other, low tolerance to more years of schooling. Only time will tell what side of the statistics they will join. We presume, however, that the resources available to them to keep their project consistent in the face of the new constraints might play an important role in the persistence, or not, of the women in the field of computer technology.

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Des formations pour une société de l'innovation.

⁴ CHESCO, *Op.Cit.*

⁵ Conseil de la science et de la technologie, *Op.Cit.* p. 15.