Women IT technicians – moving through the glass partition

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1. Abstract

A study of the lives and careers of women ICT technicians offers a different perspective to other research which focuses on traditional educational routes into computing professions. As part of the JIVE Partners project funded by the European Equal programme, we have recently completed a research study using a qualitative longitudinal approach that followed 20 women ICT technicians who were training to become Microsoft Certified Systems Engineers. We found that their routes into ICT were complex and varied and had often involved crossing boundaries between jobs which are usually gender segregated. Rather than reaching a glass ceiling that blocked their upward progression, these women found ways to make a lateral transition through a 'glass partition' into areas of work that have traditionally been dominated by men.

Whilst women form significant numbers of those studying and working with ICTs, they are usually concentrated in administrative contexts rather than in technical occupations. Although precise figures are difficult to ascertain, there are few women working as ICT technicians or support staff and those that do work in these fields find that their career prospects are limited due to the attitudes and practices within this sector.

Women in the study had a range of technical job roles some of which spanned traditional gender boundaries. The majority of the women did not choose ICT as their first profession, and for many of them there was an element of luck or chance in their entry into their current job roles. While formal careers advice had been minimal, family members (male and female) were important influencers, either as role models or as a source of information and encouragement. Prior to entering work in technical areas of ICT, these women had a range of educational backgrounds; they were often quite highly qualified but not in ICT subjects. Career decisions and future plans were strongly influenced by work life balance considerations.

2. Background

The JIVE (**J**oint **I**nter**ve**ntions) Partners project was a European Social Fund (ESF) EQUAL funded partnership bringing together ten organisations in England and Wales and a further four partners in Europe working on a number of inter-related projects between 2002 and 2005. JIVE pioneered innovative interventions in the most gender segregated sectors of industry – engineering, construction and technology – seeking to achieve a more diverse workforce. It also aimed to identify and disseminate good practice from equality training organisations to assist the project to break down occupational segregation. (Andrews, 2005) The research in this paper formed part of the ICT strand of the JIVE project, which offered training to women ICT technicians

based at two women's training centres in Oxford and Cardiff, with the aim of enabling them to achieve professionally recognised qualifications. Our research objectives were:

- to analyse the experiences of women entering employment as network technicians
- to understand the barriers women face in this sector
- to assess the impact of a woman centred learning environment in enhancing career opportunities for women technicians

This paper addresses the first two of these objectives - an analysis of the training undertaken can be found in our final report (Ellen & Herman 2005). After examining the context of the study (women's employment and training as ICT technicians) we will look at how women ICT technicians entered their careers, factors affecting their career decisions and finally their career ambitions.

3. Employment and training of women ICT technicians

Much of the literature about women in ICT focuses on ICT industries and most statistical data also looks at particular sectors, rather than ICT occupations across sectors. This makes it difficult to pinpoint actual numbers of women working in ICT (Ellen & Herman 2005) but it is reasonable to conclude that women are under represented in ICT occupations and the industry as a whole. Women continue to be under represented in the ICT sector at only 27% of the workforce. More women are employed in ICT jobs in the non-ICT sector than within it but the percentage varies by occupation, from just 8% in software engineers to 54% in the lower skill level computer operator group. (Connor et al. 2001, p. 26).

In our study, the women we interviewed were predominantly working in technical ICT roles in public sector and voluntary sector organisations (with a small number working in private sector organisations) most of which were not in the ICT sector. In fact of the twenty women studied only 3 worked in ICT companies.

Within the ICT sector as a whole, women are unlikely to reach senior levels because amongst other reasons:

- they are more responsible for avoiding the problems associated with long working hours and invasion of work into family life.
- ICT working conditions are difficult to reconcile with family and domestic life (Vendramin et al. 2002)

The long hours culture and within some areas, the perceived need for flexibility to 'get the job done' means that women are often forced to choose between progressing in their career and taking an active role in their children's development (EOC, 2004b).

Many of the jobs in the computer service sector, as studied by Valanduc et al. (2004) are in the private sector, where work life balance is often not a priority.

> "Other forms of family-friendly working or work-life balance arrangements were almost non-existent in the companies studied for this project. Some participating companies regarded families as problems that would divert employees from their work. One employer saw family-friendly policies simply as devices to be used in a tight labour market to attract a wider pool of job

applicants. In recessionary conditions, there was felt to be no need for such arrangements." (Webster 2005, p. 4-5).

In terms of career progression, it is reasonable to assume that a possible progression route for ICT technicians might be into management – however an analysis of census data reveals that numbers of women decline at higher levels. Furthermore, the age breakdown suggests that a higher proportion of women than men are 'stuck' at the technician level, not progressing into the professional or managerial roles, or perhaps had started their career later in life. (Ellen & Herman 2005).

Entry into technical support roles does not usually require a degree level qualification and career progression within ICT technical occupations has no clearly defined path or promotion route related to the achievement of academic qualifications. However vendor specific certifications relating to competencies in particular sets of hardware or software products have become essential for occupational mobility and frequent updating of skills is vital in order to keep up with technological developments. I t was precisely in order to enhance the career prospects for women ICT technicians and increase their employment opportunities, that the JIVE Partners project set out to provide a training pathway for a group of women technicians to become qualified as Microsoft Certified Systems Engineers (MCSE).

The MCSE is widely recognised as an industry standard qualification within computer network administration. To gain the full qualification, candidates must pass a set of seven exams set by Microsoft which are taken online. Achievement of at least one exam pass confers MCP (Microsoft Certified Professional) status. Before doing the exams, individual candidates have to undertake training courses which must be taught by Microsoft accredited trainers at so-called Microsoft Academies, centres which have been approved by Microsoft. The courses are often expensive (e.g. £1500 per course) and this has resulted in unequal access to these opportunities that is perpetuating women's exclusion from career progression in this sector. Although there are no official figures available on the number of women with MCSE qualifications, Microsoft have estimated that only 5% of MCPs (those with one exam pass) are women[1].

Skills using Windows network administration open up the opportunity to work in a range of organisations and sectors because of the widespread use of Microsoft systems. It therefore makes it possible for women to work for employers (or sectors) with flexible working practices and working hours that can fit around childcare responsibilities. The role of a network administrator differs from some other technical support roles, for example, those that involve hardware maintenance, where there is more expectation that irregular and out of hours cover might be needed (Gillard, 2004).

The difficulty and expense of gaining the MCSE qualification was identified as a barrier to women's career progression in this sector and the JIVE project was able to offer a series of free training courses as well as an additional package of support measures in order to maximise their chance of achieving exam success.

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[1] During the research study we discovered that Microsoft did not collect diversity data including a gender breakdown amongst MCSEs. Consequently, it is not possible to accurately pin point the number of women holding MCSE certification. However in a survey of those with MCP (Microsoft Certified Professional) status in Nov 2004, Microsoft reported that only 5% of the 289 respondents in the UK were women (Keay pers. communication 2004). MCP status is the lowest level of certification offered by Microsoft.

Research Methods

The study adopted a longitudinal approach, interviewing women twice during their participation in the project. The first interview took place prior to the start of the training, and provided information about the career and life histories of the participants. As part of the second interview carried out part way through the training courses, women were asked about their career goals and ambitions. [2]

Women taking part in the study were also asked to draw their career path. This was done to supplement the information gathered during the first interview, where they may not have recalled finer details of their careers.

As part of this process they were asked to reflect on the following:

When drawing your career path please include anything that you feel has affected your choices and decisions.

The kinds of events and influences that we are interested in include:

- Interests at school

- Influences of family/friends (e.g. interest/knowledge of their jobs prompted your subject choice at school or in further/higher education or in career choice)

- Events that led to a break in your career path (could be having children, moving due to a change in employment of a partner (or your employment)

- Events that led to a change in your work pattern (e.g. moving from full time to part time)

- Careers advice (or a lack of it experienced at school or in later life)

- Future career plans (and what might influence them)

The objective of this exercise was to get beyond the curriculum vitae which provides information about qualifications and work experience and explore those elements *in the context* of other factors which have an important impact on women's lives. No prescribed format was given other than the above list of events and influences. Results from this exercise provided important additional detail about women's career paths.

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[2] As well as revisiting their career aspirations, the second interview also explored their experiences of undertaking the MCSE course which is not addressed in this paper. Data was also collected about the learning environment and from employers but again these are not addressed in this paper. See full report for details (Ellen & Herman 2005)

4. Findings

4.1 Routes into ICT
Women in the study followed a wide range of routes into technical roles within ICT. While it is widely recognised that women's careers do not always follow a straight path, (Ahuja, 2002, Betsworth and Hansen, 1996), the range of different routes taken by these women was remarkable for its diversity. Five of them began at a women training centre as women returners without any prior ICT experience. While five others actively chose to undertake ICT higher level qualifications as a route into working in this sector, only one took ICT as a first choice of career straight from school. The table below summarises the routes taken.

Table 1 Routes into technical roles in ICT	
Job Title	**Route**
ICT Development Worker	Cardiff Women's Workshop course. No previous ICT experience
IT Support and Training Officer	Cardiff Women's Workshop course. No previous ICT experience
ICT Help Desk Manager	Career move - worked in admin, decided to do MSc in IT management which was paid for by employer
PC & Networking Support Officer	Did IT A level at College then did an Advanced Modern Apprenticeship in IT.
Customer Services Supervisor	Cardiff Women's Workshop course. No previous ICT experience
IT Trainer Assessor	Was unemployed &decided to do BTEC computer studies to improve job prospects
Technical Director	Cardiff Women's Workshop course. No previous ICT experience
Property Researcher/Network Support	Job evolved from wholly property research into a hybrid job and now half the job is ICT related
IT support desk/Helpline	Cardiff Women's Workshop course. Some previous ICT experience of using applications only
ICT Applications Tutor	Began teaching because job was offered and work fitted in with family responsibilities
IT Network Engineer	Husband encouraged private study, then she was then offered job as telecoms technician
IS Field Support Engineer	Worked in retail post, job evolved to include hardware support
PC Support Analyst	Business Studies degree included placement at IBM – first job at software company
IT Technician	Changed direction after working in insurance. Got a job working in an ICT company working alongside field engineers and then applied for current post
Computing Support Officer	Early career in teaching. Then made decision to go into ICT via educational route
Senior PC Support Analyst	Moved from admin role to help desk
IT Technician	Evolved from admin role, began by taking on responsibility for maintaining PCs in a small team
IT Technician	Decided to do Computing degree
Community Education Team Leader	Degree in Computer Science following A level computing
IT Teacher	Offered admin job if she learnt how to use a computer, then went on to study computing

While the data indicates a wide range of experiences and routes into their current roles, there are a number of themes that emerged in relation to their entry into ICT technical work.

- Women in the study were more likely to come into ICT careers later in life or as 'returners' rather than following a direct entry route
- Several of the women had "fallen into IT" taking up serendipitous opportunities rather than making an active choice to pursue this as a career.
- Prior to entering ICT technician work, these women had a range of educational backgrounds; eleven women had at least one degree but of these only four were in ICT subjects

In addition three further issues emerged which are explored in more detail below. Women in the study had a wide range of job roles, with some women detailing how they moved from a more gender traditional role into a technical role within their organisation. This evolution of job roles is explored in more detail in the next section. Work life balance issues have had a strong influence on their career choices including decisions about which sector to work in, and this is discussed in the section on career path decisions. A final section looks at women's career ambitions suggesting that conventional expectations of upward mobility do not necessarily apply in this context.

4.2 Breaking through the glass partition

The ICT industry is still strongly male dominated and in particular technical roles are widely perceived as male occupations incorporating a masculine culture within the workplace. The gender boundaries in ICT can be found between users and technicians, between outside and inside the machine, between design and application. However in our study we saw that some jobs transcend this boundary, particularly within small organizations where individuals may have to perform more than one function. So women who were once administrators have moved into maintenance, clerical roles have expanded to include tasks such as network administration and data management. In these instances, the evolution of job roles can provide a bridge for women to move into more technical areas of work. We have called this 'breaking through the glass partition' in order to symbolise the traditional segregation of technical roles by gender, but also offering the possibility that these can be breached. Rather than a glass ceiling that prohibits women from climbing up the career ladder, the glass partition separates the technical from other work of the organisation.

Five of the jobs that women were performing in this study could be defined as crossing over traditional gender boundaries.

For example one woman works as an ICT trainer in a small training organisation. Although employed as an NVQ trainer/assessor she describes herself "the only one in ICT" and therefore maintenance of the teaching PCs is her responsibility. Another woman oversees the running of a community online centre, manages the crèche and staffing generally but also looks after the network and does some ICT training as well.

Several worked in jobs which began as administrative or ICT teaching posts (i.e. more traditionally female) which then evolved to include more technical aspects of ICT support or maintenance. Some of these women chose an ICT route because

they were interested and had the chance to try things out; others were encouraged by being given additional responsibilities for which they found a liking and talent. One woman describes how her job evolved into being an ICT technician.

> "I started off just doing the research but because of the nature of that work and, it involves using computers and - I kind of grew into the role of looking after the computers and that's just escalated..."
>
> (P8, 52 year old working in surveying company)

Another woman describes how working in an administrative role within a technical department gave her the opportunity to move into a technical help desk role:

> "That was my first stage I think and then I learnt word processing package and that was when I joined IS Department here, as a secretary covering for maternity leave, for six months, that's where I learnt a lot about computers …there was a restructuring going on in our department and a new help desk was being set up and an opportunity for trainee help desk as well. So I asked my boss can I apply for it. I did and I got the job."
>
> (P17, 44 year old senior PC support analyst)

Breaking through the glass partition can also be understood as physically moving into space that was previously designated as male. Spaces can assume symbolic importance, and invisible barriers. One woman description of an incident in the server room highlights the power of this space. In this quote she talks about how entering the room and being able to offer a solution was empowering to her.

> We've had some important people [laughs] coming in to do some installations at work - I won't say where they're from, from quite a well-know company - and they sort of locked themselves away in our server room, doing this very important installation and managed to crash the network, and they were all panicky, and I happened to go in and they were saying all these strange words, well, not strange words but trying to make out what they were talking about, and I went in and said well, 'how about doing this' and it actually put the network back up. I sort of felt that you're not allowed in there, they're doing important stuff, you know, it's beyond you, sort of thing. Not that they said that but it felt that way because nobody else was there to sort the network out and everything was going wrong and I just happened to go in and that was quite nice
> (P42 38 year old ICT Technician in a primary school)

4.3 Career path decisions

The narratives given by our interviewees highlighted the difficulties that many women face when balancing their career aspirations with family responsibilities. Clearly this is not confined to women ICT technicians and is true for most working women with children, but is particularly pertinent to the career decisions of women in these occupations in terms of the type of employer and industry sectors they have subsequently chosen to work in.

Fifteen out of twenty women in our study had family responsibilities (children and primary responsibility for their care). Given that the average age of the women was 38, the number of women with family responsibilities is not surprising in itself. In this respect our cohort differs from other studies on women working in ICT industry who tended to be younger women without children, and who worked in the private sector where family friendly policies were not as prevalent (Webster 2005, Valenduc 2004))

Women in our study were mostly working in organisations that enabled them to achieve a satisfactory work life balance, with public and voluntary sector employers predominating. These spanned a range of different sectors and were mainly non-ICT organizations where the women were providing user support or network administration. Their choice of employer had taken into account work life balance; terms and conditions enabling flexible working and a wide range of leave options. Only three women in the study worked in the private sector. One woman described what she perceived to be the norm in the ICT industry and how this affected her life choices

> "I want to get married and maybe settle down one day and - but, I mean - people think of, if you're in IT, because it changes so fast, you couldn't have a family and whatever"
> (24 year old PC and Network support officer)

Those with children had already had to face these choices .When asked what she would like to do in the future another woman placed her family at the forefront of her thoughts: She clearly wants to develop her skills and stretch herself in terms of taking on new challenges, but effectively her career plans come second to her family:

> "But at the moment it's quite difficult 'cos my children, they're eleven and eight so they're still quite reliant on me, on their dad as well who is there a lot for them you know, I mean he works shifts so he's there as much as I am. But, they're still my priority at the moment and I think until they're a little bit older, it's very difficult to think about what I can do in the future because it's all reliant on them".
> (34 year old IT support and Training Officer working in the public sector.)

Her choice of job role is clearly influenced by any prospective employer's support of her need for flexibility.

Another woman who troubleshoots ICT problems in a small consultancy company that works mainly with small businesses described the difficulties associated with her job role:

> "I used to work an awful lot of hours; I used to work seven days a week... About 18 months ago I realised that my children, my daughter's now just turned twelve and my little boy's gonna be twelve in July, but - give it a couple of years and they wouldn't want to know me! And I had to make that decision to either cut back and spend time so that I knew them when they hit teenage years and we had a relationship to get through the troubled times or I , you know, I grit my teeth and accepted the fact that I would have more money but no kids, so I took the other option, so I now work nine to five when I can, I try not to work weekends so we've got the point where, well Ian says it's lifestyle business , it gives me the lifestyle that I want. I could earn more money, but - not - I'm not prepared to sacrifice time with my kids."
> (38 year old Technical Director of small ICT Consultancy Company.)

This woman's story would certainly seem to support the contention that ICT work is antithetical to family and domestic life.

Another theme that is clear from initial analysis of interview data is that career progression was not prioritised amongst women with children – it is put on hold and

decisions about jobs revolve around the impact on the family rather than career development.

> "I'm also at a new stage in my life as my youngest child is going to school full time in September which frees me up to do more training and yeah more development for myself which I have definitely put on hold. By choice for the past 6 six years. .. Being with your children during those early years pretty much full time which was what I felt I wanted to do which is why I worked in the evenings and things. And those are personal choices you make and its not saying that other choices aren't right but for me that was right. So yes [having young children] will affect me and continue to affect me and whatever job I take. For example this my dream job because the hours that I teach are within the school hours and I can imagine myself potentially being in part time work for quite a few years because if financially I don't have to be full time I'd rather be part time so I can do both work and mum."
> (30 year old currently working as an ICT applications tutor.)

4.4 Career ambitions

In our analysis of the employment and training situation of women ICT technicians above we suggested that women may get 'stuck' at junior or technician levels and are not progressing from these to managerial jobs in ICT. Yet many of the women in our study have made career decisions in the context of family responsibilities and work life balance considerations and have rejected or postponed the possibility of a conventionally perceived career path. When asked about their future career plans only two (10%) had a clear vision of their future progression, wanting to move 'up' into management.

> I would like to think that I would just move onwards and upwards and sort of, I dunno, perhaps my next step is my IT Manager's job at the moment where I'm in a small IT department with just a couple of people but I'm managing it, but then ultimately I think I'd like to be sort of troubleshooting IT stuff [...] Procurement is one I suppose I think I'd like to go into the planning stage of it a little bit more and not walk into a job where I'm taking over from somebody else but walk into a job where I'm starting it from scratch, do you know what I mean? [...] maybe in five, ten years' time […] I don't want to be the IT Support person, I want to be the IT Manager
> (34 year old IT Support and Training Officer in public sector)

Yet most did not have clear long term career ambitions. Several others expressed their ambitions in terms of developing technical expertise within their current roles, deepening and broadening their skills and technical knowledge. Indeed for one woman it was clearly the technical aspects of the job that were attractive to her rather than any prospect of promotion on a traditional upward career ladder

> No, I think up a couple of levels but I wouldn't want to sort of be a manager role, top manager role, they have too much stress, so I think that's put me off. I'm quite happy, I like to sort of keeping a good range of knowledge because once you sort of go into management you sort of lose the basic knowledge of how to do things because you're just not using it every day because there's too much paperwork.
> (24 year old PC and Network Support Officer in public sector)

In fact, the importance of having their skills and expertise recognised was mentioned by several women in terms of their motivation for undertaking the course. There was

a feeling that male colleagues would (and subsequently did) take them more seriously once they were known to be working towards or achieving the MCSE qualifications. Achievement of MCSE qualifications was seen as a passport to moving on from their current employment, opening up opportunities, expressed quite succinctly by one woman.

> What I really wanted to say that I, in the future what I really want to be is a Microsoft certified engineer so I can go all over the world and get a job.
> (38 year old PC Support Analyst)

During the course of the study the career ambitions of some women changed. Whether this was due to their skills development on the courses, support and encouragement by the project staff or other external factors at work or in their lives, is difficult to say and would need further research. A common theme that emerged was the desire for a future career that would give more autonomy but still required technical knowledge, for example four wanted to be teachers or trainers, and another to become self employed as a consultant. One woman who had worked for many years in the IT industry clearly no longer saw any possibility of gaining employment as a technician in this sector and had chosen to work in the community sector instead:

> I've been there, as you said, and it's a matter of… I believe is principles and philosophy, I don't fit, basically, in those kinds of environments. I don't like to have so much pressure on me for nothing. Like, when I say people don't say anything, like in a couple of places doing technical stuff as a certified engineer, the number of people shouting at you, ringing, angry, do this… You know, I just can't… I don't like it any more, it's too much for me now. It's alright for a 24 year-old lad or something, you know. Having said that, a lot of places wouldn't take me on anyway, even if I was Microsoft certified. In IT we don't really have racism as such but they are ageist and they are sexist. So I would have no chance to compete, even if I said I wanted to.
> (49 year old currently working in community education but with a background in network support roles in IT industry)

5. Conclusions

We started this paper by asserting that the experiences of women ICT technicians could offer a different perspective from other studies of women's careers in ICT which usually focus on higher professional levels. We used the term ICT technician to cover a range of jobs that involved the support or facilitation of others to use ICT equipment and applications. These roles are to be found in a wide range of sectors, not just the ICT industry itself or computer science in higher education where most previous studies have been focused. In our study we found that the career paths and life experiences of the women working in various occupations that we categorised as ICT technicians varied enormously.

Our analysis of women's routes into ICT revealed the possibility of moving into this area of work from another related occupation such as administration or training. This provides an important opportunity for women. Girls and young women are often inhibited from pursuing an interest in computing at a crucial time in their career development when many young men exhibit a passionate attachment to computers (Margolis & Fisher 2002). This pattern of making a lateral move - breaking through the glass partition – offers a hopeful opportunity for women who have developed an

interest in ICT later in life, perhaps as a second career. This is especially the case in small organisations (voluntary sector or private sector businesses) where multiple and hybrid roles are necessary due to staff numbers, a situation that can offer individuals the chance to learn technical skills which can then be transferred into a different context.

We have seen how women ICT technicians in the study have made difficult choices in order to achieve a balance between work and family commitments – in ICT work this may often be a choice of sector or employer rather than type of work. While network administration skills could be applied across all sectors many of the women in the study chose (or were seeking) employment in the education sector because of flexible working options and the ability for example to work only during school term times. Experiences of working in the private sector confirmed the worst aspects of bad practice reported in other research including ageism and long hours. Cultural norms within the ICT industry sector seem to be pervasive and self perpetuating, providing a deterrent for those who might otherwise seek employment in ICT.

Work life balance considerations were also a strong influence on the longer term career aspirations of women technicians in the study. Their ambitions were varied and complex and not necessarily aimed at the next rung of the ladder such as ICT management. Some women placed higher value on developing technical expertise and competency, perceiving that qualifications would provide validation and legitimacy in the eyes of male colleagues. While a move into management may seem to be an obvious promotion, the acquisition of technical competence may be of equal importance for women in terms of status and personal job satisfaction.

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