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The Women in IT (WINIT) Final Report

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1. Introduction

The Women in IT (WINIT) project was funded by the European Social Fund (ESF) from March 2004 until April 2006 under HE ESF Objective 3: Research into equal opportunities in the labour market. Specifically the project came under Policy Field 2, Measure 2: Gender discrimination in employment. The project was run in the Information Systems Institute of the University of Salford. One of the Research Associates has an information systems (IS) background, the other has a background in sociology. We begin this report with an overview of the current situation with regards women in the UK IT sector.

Whilst gender is only recently being recognised as an issue within the mainstream IS academic community, thirty years of female under-representation in the ICT field in more general terms has received more attention from academics, industry and government agencies alike. Numerous research projects and centres (such as the UK Resource Centre for Women in Science, Engineering and Technology) exist to tackle the under-representation of women in SET careers, although the figures for women's participation in the ICT sector remain disheartening, with current estimates standing at around 15% (EOC 2004). Various innovative initiatives, such as e-Skills' Computer Clubs for Girls, appear to have had little impact on these low female participation rates. Additionally, these and other initiatives have been interpreted as a means to fill the skills gap and 'make up the numbers' to boost the UK economy (French and Richardson 2005), resulting in 'add more women and stir' solutions to the 'problem' of gender in relation to inclusion in IS and ICT (Henwood 1996).

Given that there have been decades of equal opportunity and related policies as well as many government initiatives designed to address the gender imbalance in IT employment patterns, sex segregation in IT occupations and pay and progression disparity in the IT sector (including the latest initiative- a one million pound DTI funded gender and SET project), we could be forgiven for assuming that these initiatives have had a beneficial effect on the position and number of women in the IT workforce, and that even if we have not yet achieved gender equity, we can surely argue that there are positive moves in the right direction. Although we do not wish to make definitive claims about the success or failure of specific initiatives, our research, backed up by recent major surveys, paints a picture that remains far from rosy. Indeed a recent comparative survey of the IT workforce in Germany, Holland and the UK indicates that women are haemorrhaging out of the UK IT workforce (Platman and Taylor 2004). From a high point of 100,892 women in the UK IT workforce in 1999, Platman and Taylor (*ibid.*, 8) report a drop to 53,759 by 2003. As the IT industry was moving into recession anyway, the number of men in the industry has also declined, but by nothing like as much, so the figures for women are stark.

When it comes to number crunching who is employed in the UK IT sector and when trying to make historical comparisons, the first obstacle is defining the sector itself. Studies vary quite substantially in the number of IT workers quoted suggesting there is quite a bit of variation in what is taken to be an IT job. The IT industry has experienced considerable expansion over the past twenty years. In spring 2003 in Britain, it was estimated that almost 900,000 people worked in ICT firms, and there were over 1 million ICT workers, filling ICT roles in any sector (e-Skills UK, 2003). This growth has resulted in talk of a 'skills shortage' requiring the 'maximization' of the workforce to its full potential: 'You don't just need pale, male, stale guys in the boardroom but a diversity of views' (Stone 2004).

In spring 2003 the Equal Opportunities Commission estimated there to be 151,000 women working in ICT occupations compared with 834,000 men (clearly using a different, much wider job definition from that of Platman and Taylor (2004)), whilst in the childcare sector, there were less than 10,000 men working in these occupations, compared with 297,000 women (EOC 2004). It is estimated that the overall proportion of women working in ICT occupations is 15% (EOC 2004). In the UK, Office of National Statistics (ONS) statistics indicate that women accounted for 30% of IT operations technicians, but a mere 15% of ICT Managers and only 11% of IT strategy and planning professionals (EOC 2004). Although women are making inroads into technical and senior professions there remains a 'feminisation' of lower level jobs, with a female majority in operator and clerical roles and a female minority in technical and managerial roles (APC 2004).

2. Research Aims

Given the continuation of the under-representation of women working in the IT sector in England as detailed above, the WINIT project aims are as follows;

- To understand why women are under-represented both statistically and symbolically in IT in England
- To 'paint a picture' of women in IT in England using a mixture of quantitative and qualitative data
- To explore the experiences of women in IT in England remaining mindful of their heterogeneity in terms of age, ethnicity, sexuality, caring responsibilities, regional and organisational location, career-orientation, seniority and so on
- To understand issues apparent in the IT workforce specifically through a gender lens, thinking about inter-relationships between male and female, 'feminine' and 'masculine', (such as gendered identity, gendered organisations, gendered futures, burdens of care, the gendering of skills) without resorting to regressive and essentialist conceptions of gender and gender 'roles'.
- To consider the measures undertaken by various social actors and agencies to combat under-representation, whilst remaining mindful that liberalist policies and regulations (for example with regards to flexible working hours) may not be sufficient to change the situation
- To better comprehend the ways in which information technologies are used and understood by women in the industry, and the relationship this has, if any, with the gendering of technologies, and 'hard/soft' skills.
- To explore the contemporary and future-orientated images of the IT industry, analysing how these may or may not appeal to women thinking about a career in IT or women currently in the industry
- To investigate the experiences, the barriers and the drivers of women who wish to return to the IT industry after a 'career break'
- To contribute to current academic debates in Critical Information Systems, Gender and Information Systems, and the Sociology of Science and Technology.

These aims were written to allow as wide a scope as possible at the beginnings of our research, given that we preferred to use an iterative-inductive process drawing on ethnographic approaches to the social world leaving space for fluidity and flexibility (O'Reilly 2005:26). As Hammersley and Atkinson suggest, research design can be 'a reflexive process which operates throughout every stage of a project' (1995:24). Clearly all researchers have preconceptions about their research area before embarking on a project; indeed these preconceptions are vital to lend shape and substance to initial forays into the literature and the research field. However there is room within more iterative-inductive research approaches to adapt research methods and subsequent theoretical implications to emergent data as the project progresses. To give an example we adapted our interview process to concentrate more on what kinds of futures female IT professionals envisaged for themselves following the early analysis of an initial sample (100 respondents) from our online questionnaire (which was later to have close to 500 respondents). This small-sample emergent data highlighted an inordinate amount of women currently looking for a new job (in IT or elsewhere), or having just moved from one job to another, hence considering changing or already having changed their future career directions.

Our research aims, whilst adaptable, became an important point of reference for us given that when iterative-inductive research processes are being undertaken, it can be all too easy to lose direction, and feel obliged to pursue the many avenues of inquiry that more fluid research approaches undoubtedly produce. A number of our interviewees for example recounted stories about women known to them who had left or were leaving the IT industry, some vowing never to return. We wished to pursue this line of enquiry but found it too extensive to cover if we were to meet at least some of our original aims. We subsequently developed it into a separate but inter-related research project (namely 'Disappearing Women: North-West ICT') so as to give it the full attention we felt it deserved. We now turn to the background of our research work, looking at the historical, theoretical and empirical contexts of the WINIT project in general, and of the specific aims we have mapped out in this section.

3. Gender Initiatives in ICT in England

There is an array of gender initiatives in ICT throughout England, whilst communication technologies have enabled their voices to be amplified on a global scale. It would be a daunting and impossible task to compile and catalogue all the current and past gender initiatives and gender and IT focused research projects that have contributed to the growing body of knowledge. That said many websites (including the WINIT web-site¹) often publish a list of useful links which has been an invaluable resource for the WINIT team. A list of the more influential initiatives, and also gender resources which the WINIT team drew upon, is recorded below (all links were current in April 2006).

Gender and Technology Initiatives	Web-site Addresses
ACMs Committee on Women in Computing Anita Borg Institute	http://women.acm.org/
Association for Woman in computing	http://www.anitaborg.org/
Association for Women in computing	http://www.awise.org/
Aurora Gender Capital Management	http://www.awc-hq.org/
British Computer Society specialist women's group	www.www2wk.com
British Council	http://www.bcs.org.uk/bcswomen/
British organisation for working women	http://www.britishcouncil.org/diversity/gender.htm
City Women's Network	http://www.bpwuk.org.uk/
Computers Professionals for Social Responsibility	http://www.citywomen.org/
Depict – sister project at the University of Salford - directing equal pay in ICT	http://www.cpsr.org/
Digital Eve	http://www.isi.salford.ac.uk/gris/depict/
Equal Opportunities Commission	http://www.digitaleve.org/getdigital/join.html
Equalitec	http://www.eoc.org.uk/
E-quality-women	http://www.equalitec.com/
European association for women in science and technology	http://www.e-quality-women.co.uk/
European Commission: Woman and Science	http://www.witec.net
Every woman networking group	http://www.cordis.lu/improving/women/home.htm
Gender and Innovation	http://www.everywoman.com/aboutus/contact.asp
Gender-Related Electronic Forums	http://www.set4women.gov.uk
Girl Geeks -source for women in Computing	http://research.umbc.edu/~korenman/wmst/forums.html
Government initiative: women, best practice and ITEC	http://www.girlgeeks.org
Incubator for Critical Inquiry into Technology and Ethnography	http://www.equalitec.com/
Institute for Women and Technology	http://www.soc.surrey.ac.uk/incite/
Institute for Women in Trades, Technology and Science	http://www.iwt.org/
Jive consortium -Let's Twist	http://www.iwitts.com/html/iwitts.html
Manchester Women's Electronic Village Hall	http://letstwist.bradfordcollege.ac.uk
National Council for the Research on Women	http://www.wevh.org.uk/
National Council of Women (in Britain)	http://www.ncrw.org/
Networking and connecting women online	http://www.ncwgb.org/

¹ The WINIT project website may be found at <http://www.isi.salford.ac.uk/gris/winit/>.

Portia -Set for all women	http://www.womenconnect.org.uk/
She-volution women and men working in partnership	http://www.portiaweb.org.uk/
Social Science information Gateway	http://www.shevolution.com/
Social Science Information Gateway	http://www.sosig.ac.uk
Sociology and cultural studies theory site	http://www.sosig.ac.uk
Statistics Links	http://www.theory.org.uk/
Strategies of Inclusion: Gender and the Information Society	http://www.statistics.gov.uk
Systems online community	http://www.rcss.ed.ac.uk/sigis/index.php
The Daphne Jackson Trust	http://www.systems.org/
UK directory of women in business	http://www.daphnejackson.org/
UK government site on women and equality	http://www.womenatwork.co.uk/default.asp
UK Resource Centre for Women	http://www.womenandequalityunit.gov.uk
in Science, Engineering and Technology	http://www.setwomenresource.org.uk
UK women into computing mentoring scheme	http://ewm.brookes.ac.uk/computing/
Virtual Society: The social science of electronic technologies	http://virtualsociety.sbs.ox.ac.uk/
Where girls and technology click	http://www.binarygirl.com/
Widening Horizons: Improving the Role of Women in the Workplace	http://www.tees.ac.uk/depts/socialfutures/research16.cfm
Women and equality unit	http://www.womenandequalityunit.gov.uk/
Women at work	http://www.womenatwork.co.uk/clubs.asp
Women in computing	http://ewm.brookes.ac.uk/computing/
Women in Technology and International	http://www.witi.com/
Women into Computing	http://www.wic.org.uk
Women on the web	http://wowuk.webdesign-newcastle.co.uk/
Women Returners to Work	http://www.women-returners.co.uk
Women returners to work	http://www.women-returners.co.uk
Women's Opportunity for Rural Contact through Networking Education and Training	http://www.worcnet.co.uk/
Women in technology recruitment portal	http://www.womenintechology.co.uk

Throughout the project we soon realised that gender initiatives or responses to the gender and ICT 'problem' was multi-disciplinary, and came in alternative guises from e-zines, web forums, through to a mix of academic and industry-based seminars. In terms of publicising our research, we were invited to the BBC Radio 4 studio, and hosted an international interdisciplinary conference, with speakers coming from as far as New Zealand and Canada.

The WINIT team and other colleagues at the University of Salford were also invited to contribute an overview of their research and findings to an encyclopaedia with a global audience. The recent published 'Encyclopaedia of Gender and Information Technology' (Trauth 2005) is an all-encompassing single source reference book with contributions from 295 of the world leading gender and technology experts, 1,450 key terms and their definitions, and over 4,700 references to additional gender and technology focused research. This encyclopaedia (Trauth 2005) is indicative of the wealth of current research on gender and technology in the public domain. Lastly, the comprehensive reference section of this report is further evidence of the scope of resources which has been accessed throughout the life cycle of the WINIT project.

4. WINIT's Theoretical Stance

4.1 On Gender

One of the most important undertakings at the beginning point of a research project is to define, or at least think about defining, the terms of reference that will be used. Understandings of research terms used in projects can profoundly impact upon the shape and substance of research, including how data analysis is performed, and what research outcomes are produced. At the commencement of the WINIT project we were keen to think about how 'gender' and indeed 'IT' might be approached, defined and operationalised in our research. Such definitions, or understandings of key research terms, are vital to maintaining at least some semblance of coherency to research processes which can become rather 'messy' as real life takes over. We now turn to the ways in which we understand 'gender', drawing on a small part of the immense field of literature on gender that cuts across nearly all academic disciplines and all arenas of social life, including of course, the IT workplace.

Writing on the 'gendering' of sociology in the early 1970s, and the role feminism had in bring 'gender' firmly onto the agenda in academia (and beyond), Jackson and Scott (2002) note how 'gender' has since become one of the disciplines' key concepts. The same is true for other social science disciplines, although for some newer disciplines (such as Information Systems), gender is only recently being brought into mainstream analyses, often in a rather limited manner (Adam et al 2004)²

'Gender' may be defined as a social stratification phenomenon, denoting a hierarchical division between men and women that is embedded in both social institutions (such as the family, education systems, workplace) and in social practices. In terms of social practices, 'gender' is produced, negotiated and maintained at the level of everyday interaction, and is 'embodied and lived by men and women in local, specific, biographical contexts and is experienced as central to individual identities' (Jackson and Scott 2003:1-2). The 'all pervasiveness' of 'gender' means that any consideration of social institutions and practices needs to think clearly about 'gender' as an issue, or risk 'gender blindness' in its approach, as with Adam et al's (2004) critique of mainstream Information Systems. In addition, gender can be thought of as intermeshing with other social stratification 'markers' such as 'class', ethnicity, age and sexuality. Indeed recent work suggests that when developing strategies for social inclusion in the fields of information systems and information communication technologies (see Faulkner 2004), we need to consider the experiences of women based on their age, their career-stage and any family and domestic responsibilities they may have depending on their life-stage (Moore et al 2006). When devising strategies for social inclusion that focus upon gender, an awareness of the heterogeneity of female ICT professional's experiences according to other concerns (that is alongside gender) may lead to more robust and positive outcomes (Moore et al 2006).

In her book 'The Sociology of Gender', Amy Wharton (2005) uses three (necessarily partial) frameworks to classify sociological writing on the social practices that organise 'gender'. She notes how for some, the 'sociological action' with regards to gender 'resides in individuals-their personalities, traits, emotions etc' (2005:8), that is the 'individualist' approach. Wharton notes that the social practice most associated with this individualist approach is that of socialisation, or 'the processes through which individuals take on gendered qualities' (2005:31). In contrast interactional approaches understand 'gender' as inherently contextual in its creation, maintenance, impact and adaptation. Finally, and in keeping with the 'contextual' nature of interactional approaches, Wharton (2005) highlights the ways in which institutional approaches see 'gender' as embedded in the structures and practices of organisations and social institutions, which may or may not appear 'gender neutral' on the surface.

We place the research undertaken for the WINIT project, on which this paper reports, firmly in the interactional and institutional frameworks for understanding 'gender'. This is an important given that each 'type' of approach focuses on diverse aspects of the social world. By concentrating on interactional and institutional aspects of gender, we are able to render 'gender' a more relational term than individualist approaches allow for. The latter sees differences between women as a group and men as a group as greater than differences within each 'sex category', with sex seen as imposing constraints on gender. Critics of research undertaken on sex differences highlight how it 'often obscures the fact that different almost always means unequal' (Hollander and Howard 2000:340). Gender 'difference' is historically and socio-culturally produced as a hierarchical binary with 'masculine' traits and emotions most usually being privileged over supposedly 'feminine' traits.

² In an analysis of research papers over a ten year period (1992-2002) in ten key IS journals only 15 papers and one special issue on gender and IS were found. 9 of these papers were quantitative in nature, and Adam et al (2004) criticise much of this quantitative literature for being essentialist in its theorisation of gender as a dichotomy against which differences are measured.

This is vital to recognise when undertaking research on gender and ICTs. Rommes and Faulkner (2003), drawing on empirical evidence from work undertaken with ICT designers and ICT users, argue that gender binaries have two significant features. First they are usually framed as dichotomous or mutually exclusive: the 'masculine' side is by definition not the 'feminine' and vice versa. Thus the nerd stereotype says you cannot be into being technical as well as being social. Second, there is usually a hierarchy implicit, in which the 'masculine' side of the binary is valued over the 'feminine' side hence the downplaying of the computing skills of the computer enthusiast girls (2003:5, emphasis added).

Interactional and institutional approaches to gender, most usually undertaken by researchers under the umbrella of (feminist) 'gender theory', see 'gender' as a 'major social organising principle that sorts people into two separate but unequal groups' (Foster 1999:433). Feminist gender theorists firmly reject the notion that gender is an attribute, a variable, a static entity and/or a role assigned to individuals based on one's 'natural' sex category (Foster 1999). Rather, 'gender' is conceptualised as a social process and an ever-shifting, historically and culturally-contextualised set of social practices that are constituted on manifold levels of social organisation.

This conceptualisation leads to routes of enquiry which concentrate on the links between identity, culture and social structure, on the histories of gender, on the everyday social practices that produce and re-produce gender and on the consequences of the social construction of unequal difference (Hacking 1999) for the everyday lives of women. As Foster notes, drawing on the work of Lamphere et al (1993), such a theoretical perspective informs empirical work, allowing for 'an analysis of both the differences and commonalities among women without taking 'women' as either a homogenised or decontextualised analytic' (1999:438). Von Hellens et al (2004) provide an apt example of empirical work that explores the binaries, or in their terms 'gender specific dualisms' relating to skills and attributes within IT work. Analysing their interview data using Giddens' Structuration Theory (1984) they demonstrate that the dualisms they identified represented skills and attributes as either/or propositions associated with gender, such as attention to detail ('feminine') and assertiveness ('masculine'). Interestingly they also identify contradictions in these 'gendered' and 'gendering' dualisms, 'indicating that these polarised views of women and IT work are being undermined by women in the IT industry' (Von Hellens et al 2004:103). Such work looks at 'gender' in context, viewing it as a relational term and as a social practice that has differential 'impacts' on women's lives across particular times and spaces (the workplace and the home for example). Hence to argue that gender is 'socially constructed' and contextual does not necessarily imply that the gendering of the social world has no 'real' effect. As Foster (1999) states, 'When gender theorists argue that the category 'woman' is socially produced, they are in no way arguing that such social constructions do not have very real consequences for people's lives' (1999:441).

4.2 On Women in/and ICT

Moving on to the study of gender in relation to IT workplaces, there are two relatively distinct approaches that can be mapped onto the aforementioned frameworks. Here we acknowledge that this mapping is only partial and that work on gender and technology is diverse in its reach. Nevertheless, it can be argued that the first, what might be termed 'liberal feminist' approach, focuses on the 'exclusion' of women from IT, specifically in terms of access to ICT (computers, the internet) at various stages and in various settings across the life course (home, school, work). In addition the 'liberal' approach concentrates on the under-representation of women on IT courses and within the IT industry. This approach also looks at the conditions of work for women in the IT sector, including pay and progression (of lack thereof).

Perhaps the most notable aspect of the 'liberalist' agenda is the recommendations for action advocated. The liberal feminist approach to the 'problem' of women in computing, typified by Women in Science and Engineering (WISE) and Science, Engineering and Technology (SET) discourses (Henwood 1996) highlights the need to improve access to ICT, the need to encourage more women onto computing courses (and more generally SET courses) at all levels of education, and the need for better Equal Opportunities and Managing Diversity legislation and initiatives to advance the lot of women in ICT and more generally SET. It is suggested that economic benefits for specific employers and for the UK economy may be garnered through better gender equity, with the IT 'skills gap' being narrowed through the greater participation of women in the IT industry for example (E-Skills/Gartner 2004).

There have been many criticisms of the liberal feminist approach in general terms and in terms of the actions advocated to address gender imbalances in IT settings (Cockburn 1986). Criticisms also include the liberal feminist tendency towards technological determinism, given that it leaves 'technology' largely untroubled, and fails to question women's inclination to participate (and their subjugated inclusion) in the capitalist military-industrial complex³ (Wise 1997) that organises technological interventions in the 'social' world, including the new technological assemblages that capitalist corporations constantly produce and reproduce in their will to power and profit. The 'individualism' of the liberal feminist approach to the 'problem' of women and technology has also been highlighted as problematic, situating the 'problem' as it does with the 'failure' of women to realise the (liberating) potential of technologies (such as the internet), their 'failure' to properly engage with these technologies in home and workplace settings and their 'lack' of awareness of the myriad of career options made available through technological engagement. We suggest, with others (Clegg and Trayhurn 1999), that there is more to the women and computing 'problem' than getting more women into the IT industry and into particular (high-paid, more prestigious) posts, although this is of course important. With the contextualisation of the woman and computing 'problem' comes the highlighting of the unsuitability of the IT workplace for many women; the long hours and presenteeism (Simpson 1998) culture that exists within IT, negative perceptions of part-time workers in the IT sector (DTI 2004) and of part-time work more generally (Epstein et al 1999, Hakim 1991), the instability of the IT market, and the deeply ingrained 'masculine culture' of IT - these aspects need to change before (some) women can comfortably find a place within the IT industry. Rather than women, and for example older workers, being forced to 'adapt' to the current IT culture, it is suggested that the IT industry needs to broaden its appeal to a more diverse pool of talent (Women and Equality Unit 2004, Platman and Taylor 2004).

Despite these criticisms, it is clear that the liberal feminist approach to women and computing draws its appeal from the mandates for action made possible by 'standpoint' feminism. In the contemporary academic climate of post-structuralism and postmodernism, whereby the categories of 'experience', 'reality' and 'women' are being so radically troubled, what it means to speak of 'woman' as a category has been questioned. As Pini (2001) highlights, writing on the 'erasure' of women from (male-stream) academic explorations of contemporary rave/club/dance music cultures and histories,

Perhaps one of the most pressing questions facing post-structuralism feminist theory and politics today, concerns how to speak of 'women' and 'women's experiences' without denying differences between women, and without resorting to a form of essentialism (2001:63) McRobbie (1997a) offers us a way of thinking about and writing of the experiences of 'women', which, whilst distanced somewhat from traditional forms of 'standpoint feminism' (which tend to leave the category of 'women' relatively untroubled), still enables feminist writers to connect theory to contemporary women's experiences whilst minimising the deconstructive and self-interrogatory tendencies inherent in post-structuralist teachings. McRobbie (1997b) suggests the strategic utilisation of what she calls the three E's; the empirical, the ethnographic and the experiential, whilst being wary of the three 'anti-Es', namely anti-essentialism, post-structuralism and psychoanalysis. In this way women's experiential accounts can be taken seriously through the acknowledgment of their partiality and 'situatedness'. Braidotti (1994) helpfully sums up the partiality and situatedness of speaking about, and identifying with, the category of 'woman' (linked to the recent, and much overdue, troubling of male 'reality') saying, In feminist theory one speaks as a woman, although the subject 'woman' is not a monolithic essence, defined once and for all but rather the site of multiple, complex and potentially contradictory sets of experiences defined by overlapping variables such as class, race, age, lifestyle, sexual preferences and others (1994:4).

The WINIT project draws on the partial and situated knowledges approach of a politics of difference with regards to writing on 'women' suggested by Bradiotti (1994), Haraway (1991) and McRobbie (1997a, 1997b) This approach allows for the exploration of women's experiences whilst acknowledging the problematics of liberal and standpoint feminism. As Haraway suggests a politics of difference can emphasise that 'experience like difference is about contradictory and necessary connection' (1991:109) whilst avoiding the homogenising and appropriating effects that (gender) classifications can have. With the troubling of 'gender' and of 'technology' it can be difficult to give voice (and weight) to women's experiences. However, as McRobbie (1997a) states, we can feel the anxieties about essentialism, know the nerves about making 'truth-claims', worry about the undermining of the status of lived experience in a post-structuralist and deconstructive academic climate, and experience the insecurities of writing for and as women without claiming to be their 'representatives', and still (carefully) undertake research on the lived experiences of sexed subjects-in-culture.

³ By this Wise (1997) means the conjunction of the military establishment and the arms industry, both inflated, in the US at least, by Cold War demands. The relationship between technological development for military purposes (through aerospace engineering companies such as BAE Systems) and capitalist accumulation remains highly relevant today (Adams 2000). Whilst we do not suggest that technology is deterministically patriarchal (or capitalist) and that women are 'naturally' the victims of men's technology (see Berg 1997, ch 1) issues of power and knowledge in the co-production of gender and technology need to be considered (Faulkner 2001)

4.3 On Technology

So what of 'technology'? As with 'gender' we approach 'technology' with caution following its troubling by the sociology of science and technology (SST) and feminist studies of technology (Cockburn 1983, 1985, Faulkner 2001, 2004, Wajcman 1991, 2000, Wyatt 2006). Technology is generally 'black-boxed' in that the human (or more usually male) work that goes into its production is obscured by technological determinism which separates out technological 'development' from the 'social' sphere and produces technologies (and their 'effects') as 'inevitable' and usually desirable (as 'progress'). 'The social' is thus viewed as an entirely separate entity to the technological tsunamis that continuously swamp it. Such views of technology, which tend to leave the status quo undisturbed, give little or no space to the discursive co-construction of gender and technology. It is in the nexus of this co-construction that science, engineering and technology (SET) can so unswervingly be produced as a 'masculine' domain. In contrast to a technological determinist position, but not without its critics (Akrich 1992, Albertson and Diken 2001) social constructionism argues that technologies - what we think them to be capable of, and not capable of, who we think they are 'suitable' and 'unsuitable' for and so on - are produced through gendered discourses and social interactions. Hence our understandings of (here information communication) technologies are culturally and historically embedded, and profoundly gendered.

Concentrating on gender issues in relation to the 'troubling' of technologies, the implications of a social constructionist position enables the questioning of the emancipatory tendencies viewed as 'inherent' in technologies (such as 'labour-saving' devices and more recently the Internet) and these technologies' supposedly liberatory potential for women, through the enablement of 'new' forms of working such as 'tele-work' (Golding 2000, Wilson and Greenhill 2004) or online learning (French and Richardson 2005). Wyatt (2006) usefully summarises feminist approaches to technology as below:

	Technology	Women/Men	How change occurs
Liberal feminist	Neutral – can be used for good or bad	Women homogenous group with certain characteristics/ men & women different but equal	Equal opportunities (policy) Any change to tech will come about through involvement of women
Eco-feminist	IS masculine (rational, objective...)	Women closer to nature Men against women & nature	Women (& men) should reject tech and live more 'natural' lives
Techno-euphoric	ICT IS feminine	Women network/ make connections Men too linear	Through women embracing potential of ICT
Constructivist	Imbued with social relations of capitalism & patriarchy	Women & men gendered – relationship to technology central to this process	Gender & technology mutually constituted – both need to change – limits within capitalism

Table 1: Feminist Approaches to Technology (Wyatt 2006)

One of the key features we draw from Wyatt's topology is the importance of men and women's relationships with technology for the continuing production of gender, 'femininities' and 'masculinities'. Technology is central to the gendering of men and women. Within the WINIT project we have attempted to keep this point at the forefront of our analysis, asking women for example how they related to technology when they were younger, and how they felt about ICTs now they were working in the sector. Wyatt's topology is also useful in that it gives one a sense of what kinds of 'mandates for action' each approach might suggest, and hence links what can sometimes seem like rather abstract theories (about the social shaping of technologies for example) to 'real-world' possibilities for change.

4.4 On Work

One of the bodies of literature on which the WINIT team drew was past and present work on women's position in the labour market and in the workplace in terms of issues, amongst others, such as occupational segregation (EOC 2004a), gender segregation in management roles (Wirth 2001, Wajcman 1998), women's unpaid work in the domestic environment (Edwards and Wajcman 2005: 52-58), equal pay issues in the IT sector⁴, gendered organisations (Acker 1990), and gendered career paths (Dex 1987, Evetts 1996). Again this body of literature is sizable to say the least, and hugely varied in approach, so we do not attempt to review it here. However, a truncated version of Fletcher and Ely's Four Frames

Frames	Gender definition	Problem definition	Approach to change	Benefits/limits
'Fix' the women	Socialised sex differences	Women lack skills and know-how to 'play the game'	Develop women's skills through mentoring	Helps individual women to succeed, but leaves system and male standards intact, and blames women
Celebrate differences	Socialised sex differences, separate spheres of activity	Women's skills not valued or recognised	Diversity training, reward and celebrate differences	'feminine' approach valued, but reinforces stereotypes, and leaves processes in place that produce differences
Create equal opportunities	Sex differences in treatment, access to opportunity	Differential structures of power and opportunity	Policies to compensate for structural barriers	Helps with recruiting, retaining and advancing women, but has minimal impact on organisational culture, and may result in possible 'backlash'
Revise work culture	Gender as a central organising feature of social life (including working life)	Social practices designed by and for white, heterosexual, class-privileged men appear neutral but uphold differences	Emergent, localised process of incremental change involving critique, new narratives and experimentation	Exposes apparent neutrality of practices as oppressive, but resistance to 'deep' change and may be difficult to sustain

Table 2: Understanding the Four Frames on Gender (adapted from Fletcher and Ely 2003:5)

table (above) can be helpful when characterising the different 'ways of knowing' about what gender 'is' and why inequities exist between men and women, here specifically in the workplace. Of course these 'Four Frames' are by no means exhaustive, but rather act as a 'launch pad' from which to further explore the epistemological underpinnings of much writing on gender and work.

We have included this adapted version of these 'Four Frames' as we feel it will help the reader (especially those from non-academic backgrounds) to question some viewpoints on women working in IT workplaces. In a sense the WINIT project draws in part from all 'Four Frames', although we tend towards the last three more so than the first one. Above all we have included these 'Four Frames' so we can better question them! To give an example, the searching empirical work of Ruth Woodfield, which we look at later in this document with regards the gendering of skills in ICT workplaces, clearly highlights some of the problems with the Second 'Celebrate Differences' Frame. Woodfield (2002) notes how such 'celebrations' of women's supposed 'superior people skills' for example can actually undermine some women's struggle for workplace recognition. Frustration at the lack of progress for improving women's position in the IT workplace strengthens the temptation to call for action ('more women in IT' for example) based on a simplification of the possible reasons why women remain disadvantaged in this sphere, as elsewhere. Having explored approaches to gender, technology and work which have informed WINIT, we now move on to the methodology and methods deployed for our programme of research.

⁴ For more details on this issue please see the DEPICT project website at <http://www.isi.salford.ac.uk/gris/depict/index.html>

5. Methodology

This section details the data collection methods that were used throughout the WINIT project. The two key methods were an online survey, and a series of in-depth qualitative interviews with women working in IT workplaces or in IT positions in non-IT sectors (such as finance) in England

5.1 Questionnaire data collection and analysis

One of the WINIT project's primary aims was to conduct an in-depth exploration of the experiences of women in IT. To this end a series of semi-structured interviews were undertaken. Such empirical work is well-suited to the exploration of women's experiences. In-depth interviews offer the space to explore the 'situated knowledges' that structure life in the IT workplace, and provide the opportunity to explore the nuanced links between women's domestic situations and their (public sphere) working lives. That said the WINIT's team have also produced more quantitative data on women's experiences of ICT providing a backdrop to our rich qualitative material. This need for quantitative data is linked to the need to generate representative and valid data to be used in arguments based on the 'business case' (and liberal feminist case) for encouraging more women into IT and based on the idea that women may prove to be a key resource of skilled technology workers for international IT markets (Maitland 2000, 2001).

The WINIT online survey with (predominately) closed questions and 7-point scales (from strongly disagree to strongly agree) was constructed in order to capture more generalised aspects of professional women's experiences and perceptions of the IT industry and the IT workplace in England⁵. The questions were generated from reading past and present academic writing on women and ICT which highlights issues such as long hours culture and presenteeism in the ICT sector, women's 'voice and silence' in the workplace, and the image of the ICT industry now and in the future. Perhaps one of the key problems we encountered was that of definition in relation to what the IT industry is and what working with ICTs encompasses in the contemporary world of work. On this issue Von Hellens et al (2004) write,

The rapid rate of change makes it difficult to conceptualise in a meaningful way what constitutes the IT industry. Definitions produced by industry organisations...do not necessarily reflect the experience of people working in the industry (2004:110).

They point out that the ICT industry and ICT industry staff differs significantly from other complex occupations given the relative lack of institutionalised structures that might incorporate professional education requisites, membership of associations, definite career paths and professional penalties for misconduct. Such structures or forms are characteristic of other complex occupations such as law, medicine, accountancy, architecture and engineering (Encel 1970). It is in this sense that the ICT industry is at variance with other complex, highly paid occupations, rendering definition highly problematic, impeding any investigation into the under-representation of women in the sector.

Clearly we cannot offer a solution to this difficulty. Instead we have respondents' self-selection built into the WINIT on-line questionnaire process, with clear markers on the Questionnaire Introduction that the survey is directed at women in the IT industry in England. It would seem that our early set of respondents perceive themselves to be 'IT workers' and/or 'IT professionals', although some women in previous research (Adam et al 2004) contest Information Technology as their main occupational focus, preferring to describe their work as people-orientated, or creative rather than technical. Drawing on interviews with women in IT in the North-West of England, Adam et al (2004) write, 'A striking initial feature is the vehemence of women saying 'I'm not in IT but...' - 'I'm in sales', 'I'm in the people part of the organisation', 'I'm a manager' – and overwhelmingly 'I'm not in IT'. Partly these responses reflect the changing nature of IT in the workplace and IT-related occupations' (2004:18). We have chosen to ask women to define their position within the industry through details of their highest qualification, the subject of such qualifications, any IT-related courses they have undertaken, specific IT skills, positivistic career 'progression' indicators such as salary and the title of their immediate 'superior'.

The online questionnaire, securely hosted at an external site, was built using SelectSurveyASP from Classapps . SelectSurveyASP enables results to be exported into Microsoft Access and/or Excel for detailed statistical analysis. All told we had 479 respondents to the online survey. We analysed the data using Access, Excel, and SQL macros. One of the main limitations of questionnaire data is that respondents skip questions. In our case this tendency makes the data set for each question below the total figure of 479. It is difficult to say exactly why respondents skipped questions; it may have been that they did not feel that the query was relevant to their organisational context or personal situation. They may have also felt that time was 'running out' or that other tasks were more pressing, especially if they were filling in the relatively lengthy questionnaire at work or at home in the presence of children.

⁵ Due to space constraints in this report we have reduced down the data to 'agree' and 'disagree' in the analysis chapter of this report.

5.2 Interview Processes, Interview Data, Interview Analysis

As part of the WINIT project we conducted in-depth interviews with nineteen women currently working in IT in England, either in IT roles in IT companies, or in IT roles in other sectors such as higher education, and finance. The women currently lived and worked in a variety of regions and places across England. 10 of the women we interviewed lived and worked in the South-East of England (including London), 4 lived in Lancashire, 2 lived in the North-East of England (Sunderland and Newcastle), 2 lived in Yorkshire, and 1 lived in Sussex. The women were aged between 25 and 60 years of age. The women contacted us to participate after hearing about the WINIT project through a variety of channels, including through our website, press releases on women's forums, the University of Salford's Alumni, personal contacts, and the WINIT online survey⁶. We met each woman at a setting convenient for her and to a certain extent ourselves. We met 5 of the women at their workplaces. The rest of the meetings took place at either the women's home, or in a public place such as a coffee shop.

All interviews were recorded and later transcribed. Whilst we began our interviews using a rigid interview schedule we soon discovered that such a schedule did not 'fit' with the stories that the women were telling us. Several of the women for example had their own businesses (as either sole traders or as owners of an SME), so questions about their employers' formal equal opportunities policies were rendered irrelevant. We soon adapted the interview schedule until it became more of an interview guide, with key topics we wanted to cover. We became more flexible about what we spoke about with the women, allowing them to 'lead the way' so to speak on the issues that they wanted to talk about. We always started with a query about how they came to be working in IT, and ended with the question about what they thought the future might hold for them, for their IT career, and the IT industry in general. We see the interview process as a process of co-production between interviewer and interviewee, although we are aware that such a notion of co-production can sometimes assume equal power relations between researcher and researched, a notion that numerous academic writers have been quick to question through reflexivity (Riley et al 2003). Having 'co-produced' a substantial amount of data from our interviews we embarked on reading and re-reading the transcripts to discern threads of commonality, and moments of disjunctures, within and between the stories our interactions with interviewees had generated.

Having detailed the methods we used to gather both quantitative and qualitative data in order to achieve our project aims, we now turn to the findings of the WINIT project, starting with the predominately quantitative data produced from the WINIT online questionnaire.

⁶ We included an option at the end of the WINIT online questionnaire to send us contact details if respondents wished to be interviewed.

6. Overall WINIT Findings: The Online Questionnaire

6.1 Demographics of Women in the ICT Industry

Women in the ICT sector are a heterogeneous group who vary in terms of age, ethnicity, income levels, living arrangements and geographical location. From such differences comes the possibility of diversity in their experiences, their career trajectories and the barriers they face individually. However, whilst we recognise this heterogeneity, we are still able to map a flow of connections between our respondents (Moore et al 2005), following McRobbie's (1997a, 1997b) call for an exploration of women's experiences, whilst avoiding closure or appropriation in the name of 'sisterhood'.

The majority of women in our sample are aged between 30-34 years of age (20%) whilst the second largest age group (17%) aged between 25-29 years of age. This reflects the predominance of young people within the ICT industry (Platman and Taylor 2004). In contrast only 8% of women in our sample are over 55 years of age. Within our sample there is a sharp drop-off point of women working in the ICT sector after the 30-34 age group from 20% to 13% in the 35-39 age group, and then again in the 45-49 age group from 13% to 8% in the 50-54 age group (see Figure 1).

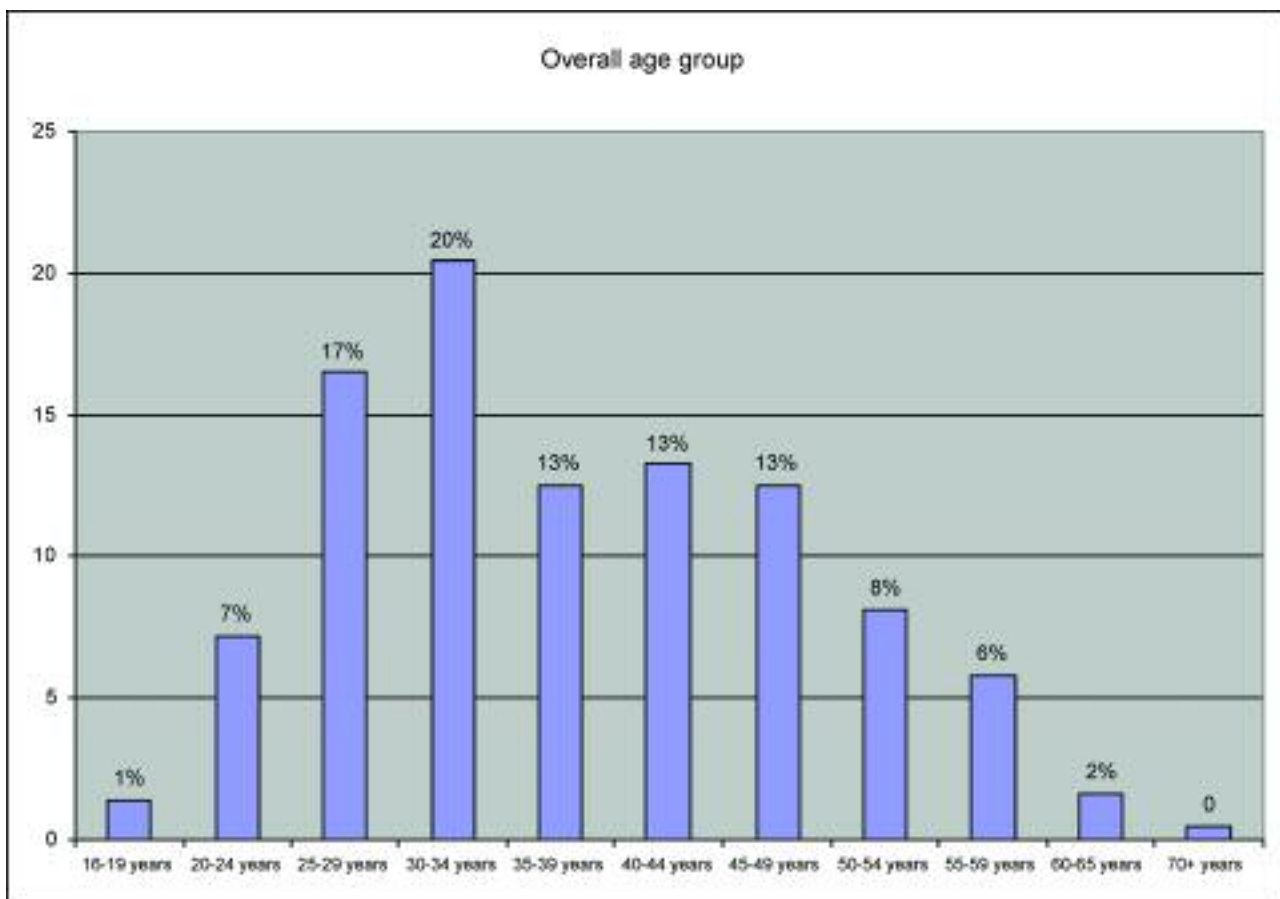


Figure 1: Overall age groups of the WINIT survey sample

This sharp drop seems to pose further questions rather than answer existing dilemmas regarding the 'haemorrhaging' of women from the ICT workforce. Here it is possible that qualitative rather than quantitative data is needed to determine exactly why there is a drop in the numbers of women in our sample according to age, commencing in our data amongst the 35-39 year age group. The continuing, disconcerting trend of 'women disappearing'⁷ from the ICT workforce is further heightened with the additional drop of 5% at the 50-54 age stage, a point at which women may be at the peak of their careers. As the DTI notes, the IT sector is losing more women than it recruits, whilst the retention of senior IT staff, particularly female senior IT staff, is a critical issue (DTI: 2005a). Rebecca George, the former Chair of the Intellect Women in IT Forum writes,

Research into the high drop off rate amongst women as they reach the peak of their careers has uncovered several reasons, including salary inequalities, motherhood, lack of promotion prospects and a lack of adequate training and development. Undesirable work locations, long commutes and frequent travel are also reasons. Some women leave to pursue other careers, which may involve starting a business (DTI 2005a:8).

More research is needed to determine the exact factors of why it is so difficult for the IT industry to retain women in general, and senior women in particular (DTI 2005). The question remains as to where these 'disappearing women' go, a question posed, and hopefully answered by the forthcoming ESF project based at the Information Systems Institute (ISI) at the University of Salford⁸. We argue that research concerned with the retention of women in the IT industry needs to be aware of the ages and related career/life-stages of women, and needs to consider the ways in which experiences of working in IT may be, at least in part, shaped by such factors (Moore et al 2005). In addition it is suggested that there is entrenched ageism in the sector (as in wider UK society) which, alongside widespread sexism (Adam et al 2005) may leave older female workers vulnerable to redundancy (Webster 2005:3). In more general terms, women are more likely to say they have been put off applying for a job because of their age than men (EFA 2005). Indeed the IT sector is thought to be one of the worst employment sectors in terms of ageist attitudes and practices (Maitland 2000).

In terms of ethnicity, the majority (85%) of the WINIT survey sample were 'White: British, Irish, Other white' with 'Asian or Asian British: Indian, Pakistani, Bangladeshi, Other Asian' being the second largest ethnic group in our sample at 6%. 6% of respondents considered themselves to be 'currently disabled'. In terms of living arrangements, 66% were living in a couple which incorporated being married, remarried and co-habiting. In terms of personal income, 15% of our sample earns between £21,000 and £25,000, whilst 15% earns between £31,000 and £35,000, with 14% in the £26,000 to £30,000 bracket. 10% fell into the lowest income bracket (£0-£9,000), whilst 9% placed themselves in the £60,000+ personal income bracket (See Figure 2).

These figures demonstrate the wide range of income levels possible within the IT industry, a range which also belies a diversity of experiences in terms of pay and rewards. This said, despite being the smallest on record since the Equal Pay Act came into effect in 1975, the gender pay gap⁹ in the UK between women and men for all occupations still stands at 17.2%, meaning that women in full time employment receive 86% of men's hourly earnings (Women and Equality Unit 2004). The part-time gender pay gap¹⁰ is much larger, with women earning about 60% of men's mean hourly full-time earnings (Women and Equality Unit 2004).

According to the Office of National Statistics (2003a) the gender pay gap amongst ICT professionals in terms of hourly earnings stands at 7.5% for ICT Professionals and at 10% for ICT Managers, which is slightly narrower than the figure for all professional occupations. However, these figures worsen if we look at the ICT professionals' gender pay gap in terms of weekly earnings. According to the Office of National Statistics (ONS) Labour Force Survey (Q1, 2005), female ICT staff's weekly

⁷ The 'Disappearing Women' project: North West ICT will use qualitative data collection methods to investigate the push and pull factors that have led to women leaving ICT occupations in the region faster than they are being recruited. It is crucial that research is undertaken to find out where women go and why they leave the sector.

⁸ The ESF funded 'Disappearing Women Project: North-West ICT', commencing April 2006, will look at why women based in the region in England leave ICT, what push and pull factors contribute to high attrition rates amongst particular age groups, and what these women do after they leave the industry. For more information please contact Marie Griffiths-m.griffiths@salford.ac.uk and/or Karenza Moore-k.moore@salford.ac.uk

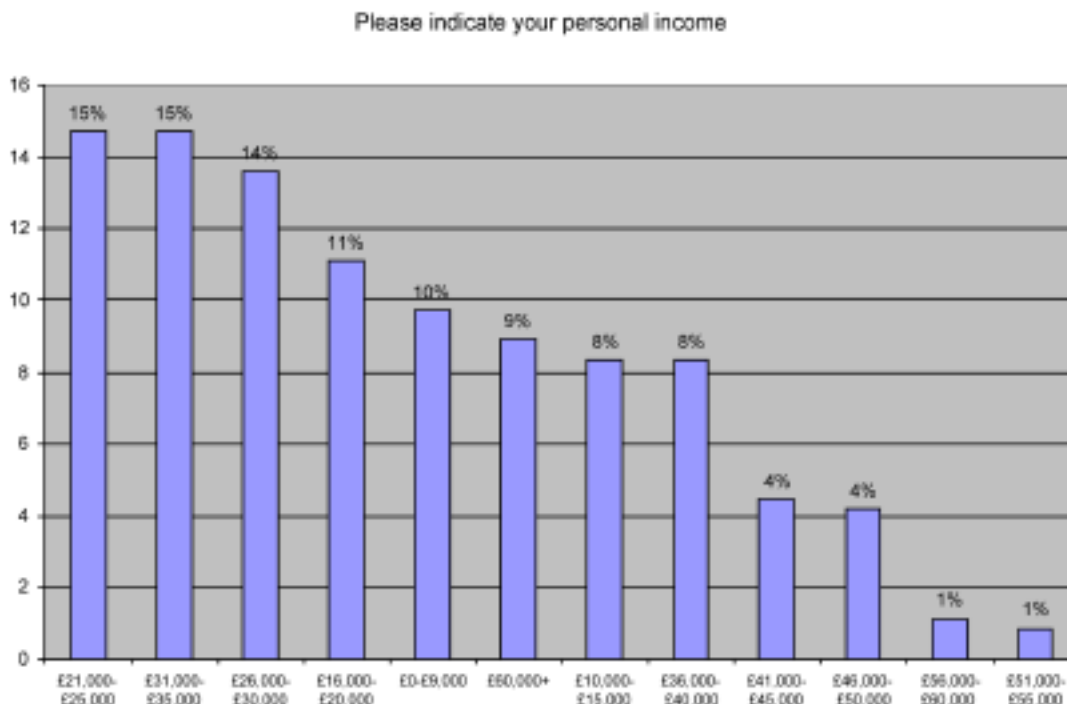


Figure 2: The personal income levels of the WINIT survey sample

earnings are on average 18% less than their male counterparts (E-Skills 2005:2). Whilst it is true that a larger proportion of ICT female staff work part-time, even if just full-time ICT staff are considered women's weekly earnings stand, on average, at 12% less than their male counterparts⁹. Added to this debate is the awareness of the ubiquitous long hour culture associated with this sector and the ever present challenge to quantify unpaid overtime (Computer weekly.com 2004). Indeed the normative expectation to undertake unpaid overtime has been identified, alongside high levels of organisational turbulence (Taylor et al 2004) and the spread of 24-hour/7-day working, are all well documented features of contemporary workplaces (Hyman, Scholarios and Baldry 2005:707).

Geographically women in our sample are predominately located in London and the South-East of England (40%) with North-West England (17%) having the second highest proportion of respondents (See Figure 3 next page).

⁹ Please see <http://www.womenandequalityunit.gov.uk/pay/pay.htm> 'The full-time gender pay gap currently stands at 13.2 per cent using the median and 17.2 per cent using the mean, which means that women who work full time are paid on average just 86.8 per cent of men's hourly earnings using the median and 82.8 per cent using the mean'.

¹⁰ The part-time gender pay gap is based on the hourly wage of men working full-time and women working part-time, which is defined as being less than 30 hours a week. The part-time gender pay gap for 2005 was 41.1 per cent, as measured by the median - down from 42.5 per cent in 2004. Using the mean, the part-time gender pay gap in 2005 was 38.5 per cent - down from 39.6 per cent in 2004.

¹¹ For more detailed information on this issue than we are able to present here please refer to the EOC (2004) 'Working Paper Series No.17: Modelling Gender Pay Gaps', Manchester: EOC, and to www.isi.salford.ac.uk/gris/depict/index.html where more information can be found about the work of another ESF-funded project DEPICT, based at the ISI, University of Salford, which is focusing on the gender pay gap in the ICT industry in England.

Regional location of participants

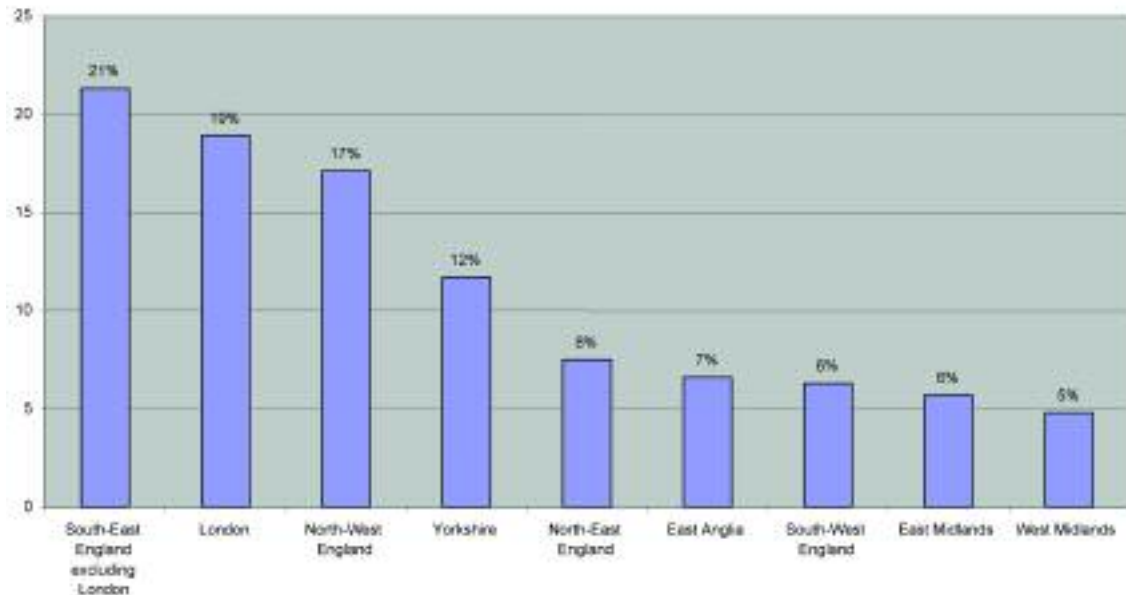


Figure 3: Regional location of WINIT survey participants

It is clear that this regional clustering of respondents is related to the manner in which the IT industry, and hence IT workers in England, is clustered predominately in London and the South-East. E-Skills UK also noted that according to the UK government's Labour Force Survey, 40% of IT workers are concentrated in London and the South-East, with 1 in 16 employees in London being an IT worker (e-Skills UK 2004a:16). In the WINIT survey sample, respondents' workplaces are clustered in the same manner (Figure 4 below).

Regional location of participants' workplace

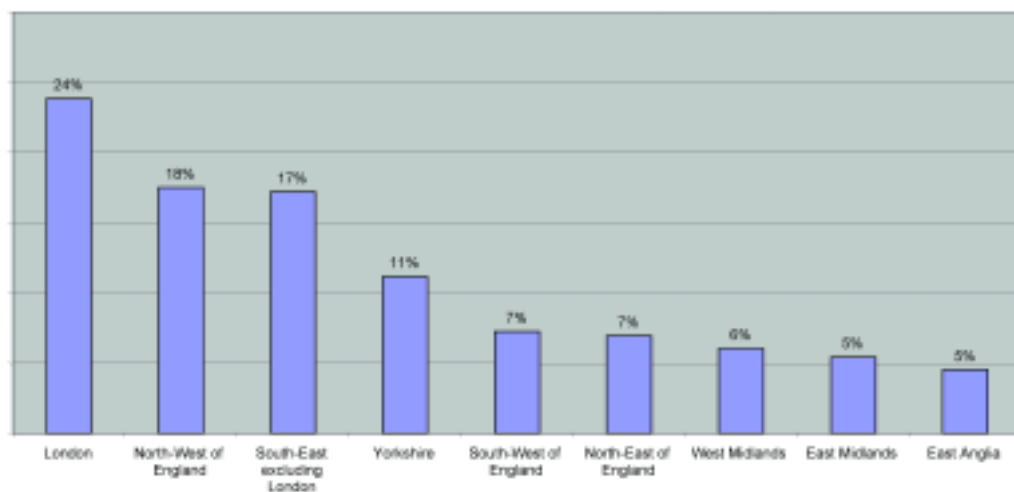


Figure 4: Regional location of WINIT survey participants' workplaces

Here we see that the majority of WINIT survey respondents both live and work in London and the South-East of England, although a sizable proportion work in the North-West of England. The WINIT figures correspond to e-skills UK's findings on the regional distribution of the IT workforce (see Figure 3.3, e-skills UK 2004a:17).

6.2 Carer vs. Career? Managing Caring Responsibilities

One of the key factors that relate to women's position within the ICT workplace is the gendered 'burden' of care and the difficulty of managing dual careers i.e. parent/carer and worker (Liff and Ward 2001). As Figure 5 demonstrates, 7% of women in our survey are currently caring for a sick and/or elderly relative.

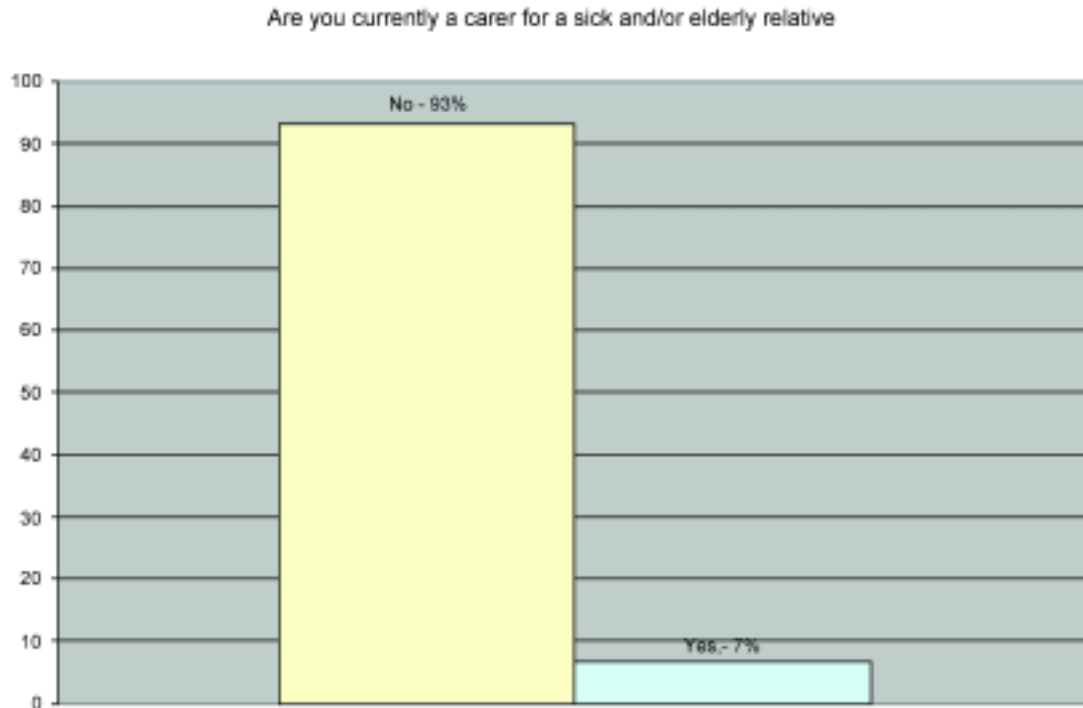


Figure 5: Proportion of WINIT survey respondents caring for a sick and/or elderly relative

According to the Office of National Statistics (ONS 2005) the majority of carers are female (3.4 million compared to 2.5 million males) with female carers outnumbering male carers in all age groups apart from those over 75 years of age. This indicates the importance of considering women's activities (and the gendering of such activities) outside of their immediate (public) working environment. In terms of 'informal' caring responsibilities this involves numerous implications of being a female carer (Arber et al, 2003). As Arber et al (2003) notes, informal care in the UK implies family care, and, within families, the bulk of the caring is provided by female family members. Much research has confirmed that (both male and female) carers often find themselves largely unsupported in situations which are emotionally, physically and financially draining (Arber et al 2003) with little legal or no recognition of their efforts and skills despite recent changes to the law (Gillies 2000). Whilst only a small number of women in our sample indicated that they were caring for a sick and elderly relative, we feel this is an important issue to highlight given the pressures that caring (both for elderly relatives and for children) brings to women's lives, particularly those working in a sector that is known for its long-hours culture and is dominated by male workers and male managers, amounting to what Wendy Faulkner calls a 'masculinised domain' (Faulkner 2001). As a recent DTI report notes, 'It can be difficult to maintain family commitments in an environment where 68% of staff can work up to 10 hours a day' (DTI 2005a:8). In such a long-hour, masculinised culture, it may be hard for female ICT professionals with caring responsibilities to feel comfortable seeking practical and symbolic support from (male) colleagues with regards their non-work commitments.

As Figure 6 demonstrates, the majority of female IT professionals in our sample do not have children (54%), although 46% do. Again the majority of women in our sample do not have children living with them (64%) as Figure 7 indicates, although 36% do. The higher figure for women not having children living with them is related to those women with older children (post-18) who have left home for university, to work and to travel.

Please indicate no. of children you and/or your partner have

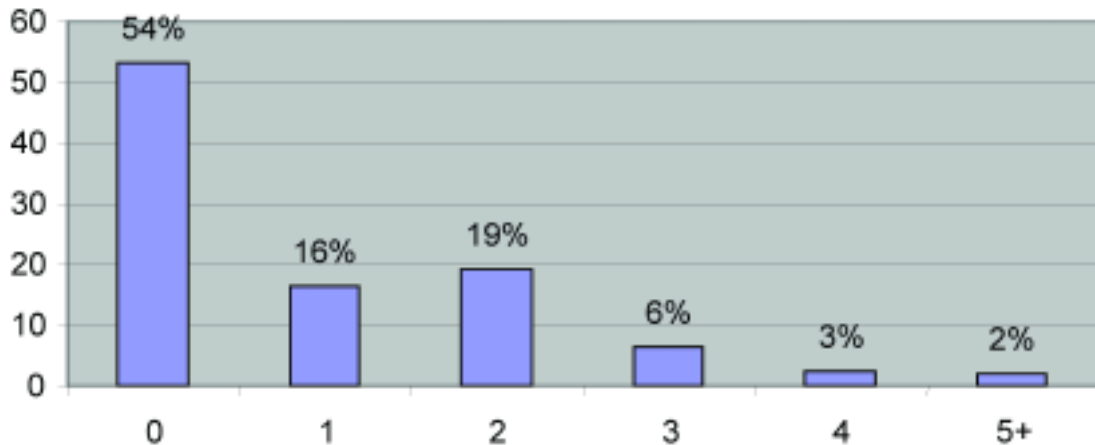


Figure 6: Proportion of WINIT survey respondents who have children

Please indicate number of children living with you

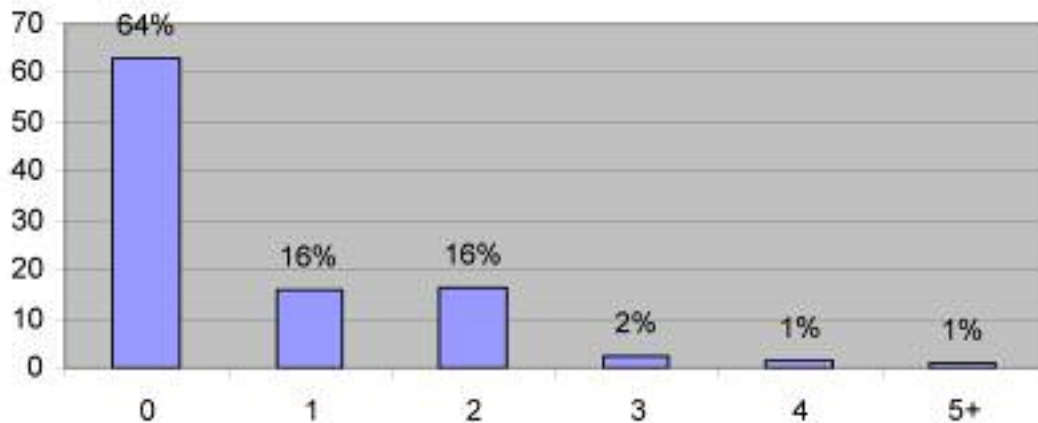


Figure 7: Proportion of WINIT survey respondents who have children living with them

With 46% of our sample having children, and 36% having children of all ages living with them, it is clear that a sizeable number of women in our survey sample have considerable caring responsibilities alongside their professional responsibilities. In this sense we were interested in the kind of changes, if any, female IT professionals made to their working practices in light of such caring responsibilities. Clearly women working in IT are not wholly free to choose their working patterns, particularly since there is a dearth of part-time positions in the sector (ONS 2005b). This is despite part-time work by women being the largest source of employment growth in the UK over the past 30 years, with around 45% of women now in work in the UK working part-time (Connolly and Gregory 2005). Indeed some 86% of our survey respondents work full-time, with only 14% working part-time. Looking at the situation for both genders in relation to working patterns amongst the IT workforce in the Netherlands, Germany and the UK in 2002, Platman and Taylor (2004) noted that a mere 5.3% were working part-time compared to 94.7% full-time workers.

When asked to indicate any changes in their working practices that had occurred as a result of their children¹², the most popular answer amongst this sub-sample (n.149) was a shift to part-time work (16%), as Figure 8 shows

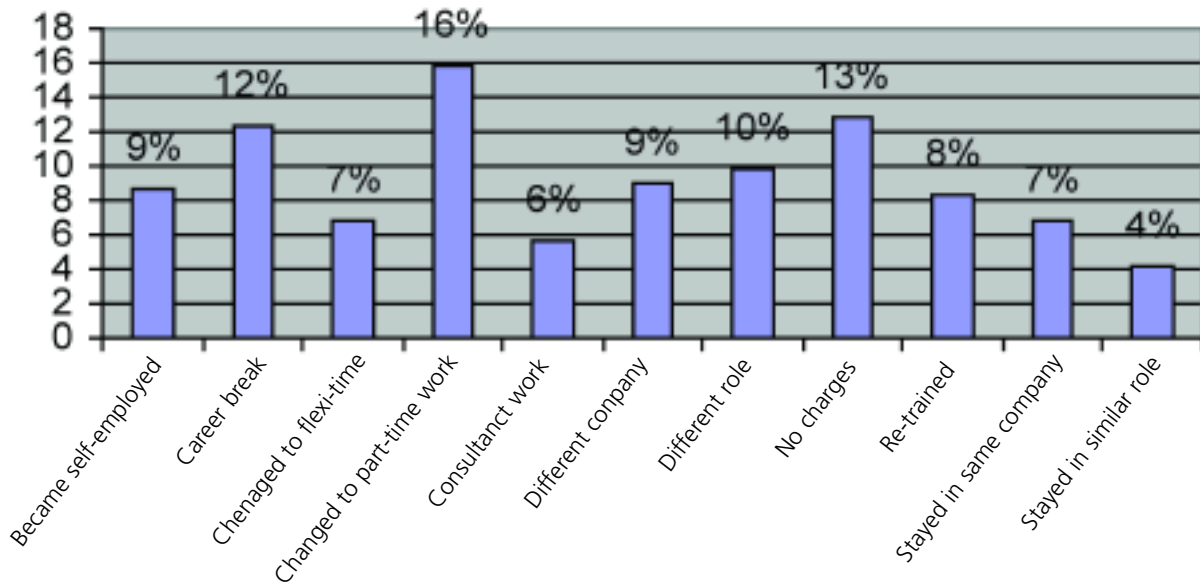


Figure 8: Changes WINIT survey respondents made to their working practices as a result of having children (sub-sample n.149)

A similar percentage (13%) of women made no changes in hours, role or company at the advent of their children to the percentage of women (12%) who commenced a career break. Other relatively common changes were a move to a different role (10%), a move to a different company (9%), and becoming (or planning to become) self-employed (9%) and re-training for a new career (8%). Some women in this sub-sample answered in an additional text box about the changes they had made to their working patterns as a result of having children, including "Increased home working", and "Career break, then self-employed, then different role in full-time employment". One respondent wrote, "This was seven years ago. I took extended, unpaid maternity leave (from studying), returned part-time, went full-time, changed jobs and now run the company". Such examples demonstrate the resourcefulness, adaptability and determination of women who juggle children and a career. However, behind these changes in working practices lie nuanced gendered experiences and gendered patterns of work and care. The continued low status of 'flexible' (but ultimately 'feminised') part-time work and the curtailing of female part-timers career progression as linked to this low status problem is one example of this phenomenon. A recent DTI report states 'it appears that there are few opportunities to work part-time in the IT industry and that these opportunities almost totally disappear in senior management' (2005b:17).

When asked exactly why they had made changes in their working arrangements related to having children¹², the most common answer was that the female IT professionals in our sub-sample (here n.132) with children saw changes as precipitating a move towards greater 'flexibility' (21%), whilst 18% indicated that the decision to make changes was a joint one with their partner and employer. 17% of women in this sample could not afford to give up work completely as a result of having children, whilst a similar percentage (16%) indicated that they did not want to give up work completely. 14% of the women in this sub-sample indicated that these changes to their working practices were entirely their own decision, although 3% of women said that the changes had been forced upon them by their employer and/or their partner. 6% of the women had made the changes as a result of their own greater earning power (over and above that of their partners) whilst 5% had made changes as a result of their partners' greater earning power (over and above their own).

¹² Respondents were asked to choose as many options as applied to them, so the percentages in Figure 8 represent the most popular choices of the sub-sample.

Again some women in this sub-sample (n.132) gave additional details about the factors which influenced their changes in working practices as a result of becoming mothers. One woman described her choice to work part time as a “desire to maximise time with kids, and minimise both stress levels and disruption to the children”. Another respondent was clearly displeased with the changes she had to make, saying “Role not managed well as a job share so changed roles, not what I wanted”. Another woman simply wrote, “Bastards, total bastards”. There clearly exists frustration (and anger) with the lack of options available to working mothers, with ‘flexibility’ sometimes offering little more than added pressure as women continue to disproportionately undertake the ‘burden’ of care. In addition those women that work part-time, a relatively rare option within the UK ICT industry, can suffer from diminished career progression prospects and a possible deterioration in the respect they receive from fellow full-time workers (DTI 2004). Summarising the results of interviews with 42 women that had either left or were thinking of leaving IT, the DTI notes that a number of women referred to the lack of, and consequences of, working flexible hours in the industry. The DTI highlights women in part-time positions being made to feel, by both managers and colleagues, that they were not working as hard, or producing work of as high calibre, as their full-time contemporaries. In addition, women in the DTI sample reported being made to feel that working part-time was a ‘privilege’ and that this ‘privilege’ excluded them from other rewards such as pay increases (DTI 2005b:17). Von Hellens et al (2004) point to the problematic of the dualism of home/work and public/private as linked to women working in the ICT industry, noting,

This dualism is strongly shown by women’s choices to delay or not have children and their need to accommodate their working lives to their private responsibilities and vice versa...it presents different problems where the majority of the work force is male and is not presented with this conflict (2004:109).

This problematic of combining home/caring and work responsibilities is exacerbated by the need for ICT professionals to keep up with the rapid rate of change in the industry, making even relatively short career breaks risky.

6.3 Women in the ICT Workplace

The UK IT industry alone produces an annual Gross Added Value (GVA¹³) of £30 billion and the IT sector’s intensive industries represents 45% of the UK’s overall GVA, an indication of this sector’s crucial position in the UK economy (e-skills Nov 2004). There are approximately 20 million people in the UK alone who deploy ICT to perform their job roles (e-skills Nov 2004). It is also estimated that 4 million business managers have (and possibly need to extend) IT-related skills performing business management and leadership roles in the UK (e-skills 2004a:13).

When it comes to calculating who is employed in the UK ICT sector and when trying to make historical comparisons, the immediate obstacle is defining the sector itself with studies varying quite substantially in the numbers of ICT workers quoted. This suggests that there is variation on what is taken to be an IT job. In the second quarter of 2005 it was estimated that there are 981,000 UK based ICT staff (e-skills Bulletin 2005). The IT industry has experienced considerable expansion over the past twenty years. The workforce is predicted to grow between 1.5% and 2.3% per annum throughout the next decade. In real terms this means an estimated additional 179,000 IT professionals to join the workforce over the next ten years (e-skills Nov 2004).

However buoyant the sector is becoming, evidence indicates that women remain severely under-represented in the ICT profession in the UK (Trauth et al 2004). As Juliet Webster (2005) states, ‘IT professionals are typically male, young (in their mid twenties), and without domestic responsibilities’ (2005:2). In spring 2003 the Equal Opportunities Commission estimated there to be 151,000 women working in ICT occupations compared to 834,000 men, indicating that the overall proportion of women working in ICT occupations is 15% (EOC 2004). Other statistics suggest that 20%, or 1 in 5 IT workers, are women (e-skills UK Nov 2004). The Office of National Statistics (ONS) Labour Force Survey figures state that in 2004 women made up 21% of the ICT workforce, down from 27% in 1997. E-skills UK states that in 2003 females made up a mere 15% of ICT managers, 11% of IT strategy and planning professionals, 12% of software professionals, 30% of IT operations technicians, 25% of IT user support technicians, but a massive 62% of database assistants and clerks, positions which are usually poorly paid, and of low-status within the IT industry. Clearly conflicting statistics encapsulates the continuing challenge of defining and quantifying both the number of people in the sector, and the proportion of women in the sector, although it remains clear that women are greatly outnumbered by men.

The WINIT survey included gathering industry sector data and specific organisational data and demographic data on our female sample. From our total sample of 479 female respondents, 53% indicated that they are IT professionals but worked in non-IT sectors, with remaining 47% indicating that they were IT professionals working in IT organisations. Of those who worked in IT in non-IT sectors, 47% worked in education at all levels. The second most popular non-IT sector was finance with 11%, closely followed by business to business services at 10%. In 2004, e-skills UK estimated that 580,000 people were working in companies whose primary business purpose is IT, whilst 590,000 people working in other sectors viewed IT as their primary job role (2004a:13). This means that the WINIT survey sample (whereby respondents self-selected) corresponds to wider trends in the IT sector in terms of what constitutes the UK IT workforce.

Of the women who indicated they were IT professionals working in the IT sector, 30% were in Software (Project) Development (i.e. creation of new systems), 22% were in IT Services (i.e. systems design and configuration, IT training, project management etc) and 16% were in Software Consultancy (See Figure 9). The remaining 14% of our sample of female IT professionals working directly in the IT sector were in IT Operations, IT Sales and Marketing, and finally New Media. Whilst some IT sectors employ substantial numbers of women, in all cases men are in the majority (EOC 2005). Women are more strongly represented in lower level ICT occupations, and are particularly under-represented in IT services, telecommunications services and electronic manufacturing (EOC 2005). Such trends have continued on from the late 1990s, with women tending to undertake low skilled and lowly paid IT work, whilst men dominated the highly skilled and highly paid work (Panteli et al 2001). Finally, women constitute only 2% of open source programmers (Nafus 2005)⁴.

If you are an IT worker in an IT organisation, what is the principle nature of its business?

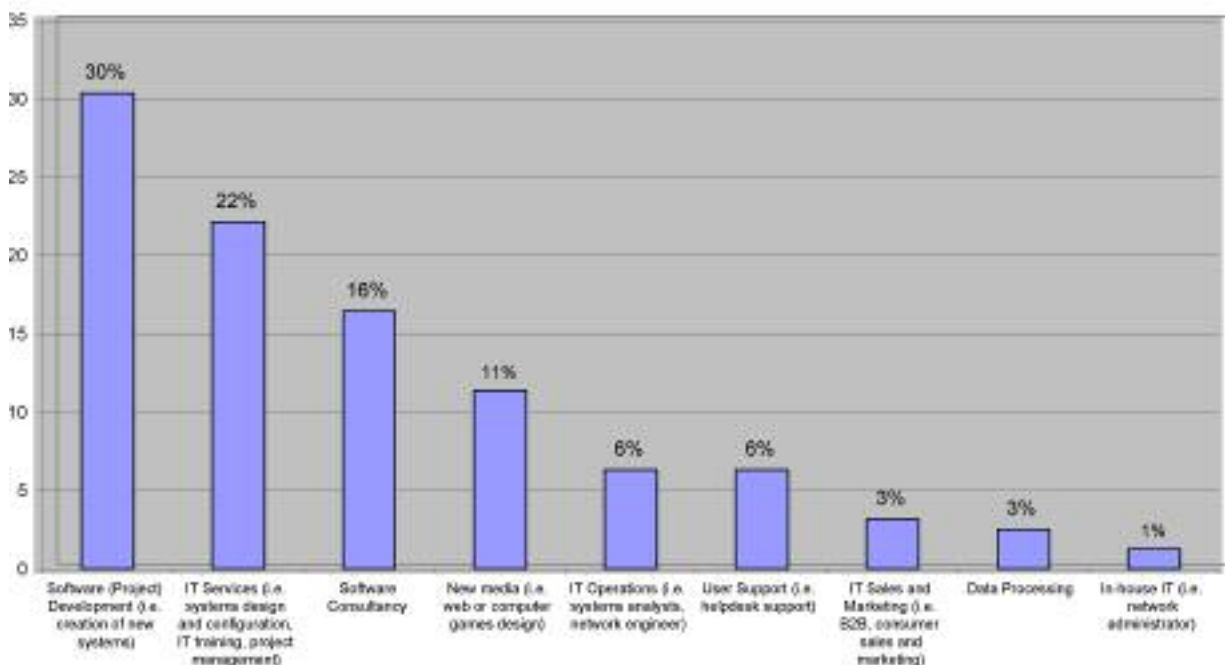


Figure 9: WINIT survey sample working as IT professionals in IT organisations

The respondent group that decided to answer the IT organisation and IT industry sector questions (under 35%) in comparison to the amount of respondents that elected to answer the title of their current job role (74%) suggests a degree of complexity in positioning their organisation into a specific category. As previously mentioned this is indicative of the ill-defined nature of the ICT sector¹⁵, an ongoing difficulty within the Information Systems (IS) community and beyond. The 74% of our survey respondents who gave the title of their current or most recent post present a diverse selection of occupations. These include Senior Software Engineer, Senior Database Analyst, Head of ICT, Managing Director and Professor of Software Engineering.

These senior roles indicate that (some) women are progressing in their chosen profession, although the story told by our participants is an ambiguous one given that the WINIT survey data indicate that 71% of respondents have a male line manager. This reiterates that there is a gender imbalance occurring at some stage of the progression process. Liff and Ward (2001) argue that the under-representation of females in senior management roles may be explained by the promotional process and the time investment required for a senior management role. Liff and Ward (2001) argue that personality and behavioural characteristics are important to succeed alongside an embracing of the presenteeism¹⁶ culture surrounding management roles. Their research found in many cases that both male and female workers identified the same issues in relation to possible conflict between their career and family lives. However what was significant was how the different genders perceived the incompatibility of managing dual roles (parenthood and management). Men regretted that they could not see more of their children, whilst for women the major issue was the exhaustion they experienced from attempting to manage parenthood and working life (Liff and Ward 2001). WINIT respondent No. 26 for example was concerned that working women are now struggling to achieve recognition in the home, saying, 'There is an increase in considering women as not being "good mums" and men being "better fathers" so it looks like we are considered having lost the ability to be mums and men have acquired the ability to look after children'. Again we see here the conflicts and very 'real' consequences generated by essentialist versions of 'woman' (and 'man'), in which women who excel in one sphere of life (career, public) 'cannot' simultaneously excel, or supposedly even 'cope', in another (carer, private/domestic).

In terms of the working patterns of all WINIT respondents, 74% have full-time roles, with an additional 12% working full-time flexi-time (see Figure 10 below).

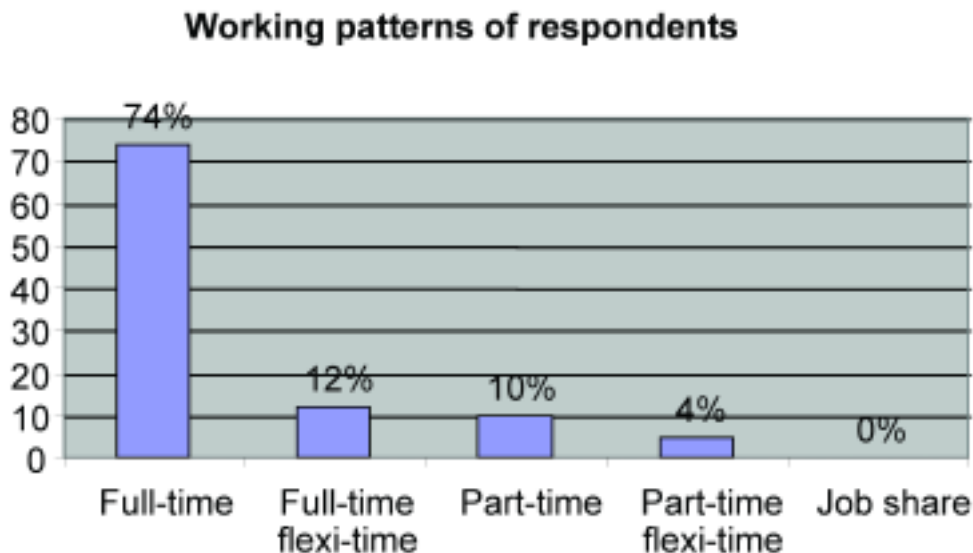


Figure 10: Working patterns of WINIT respondents

¹⁴ Dr Dawn Nafus supplied this figure, drawn from her on-going work on gender and open source, via a personal e-mail communication with Dr Karenza Moore.

¹⁵ The broad convergence of communications with information technology has led to a recent shift of these industries being classified as ICT. For a detailed discussion of the difficulties of defining IT, ICT and the ICT industry please see Duerden Comeau, T. 2003, Information Technology (IT) Employment: What is IT?, Workforce Ageing In The New Economy (WANE) working paper, www.wane.ca

¹⁶ Simpson (1998: S38) defined as 'being at work when you should be at home either because you are ill or because you are working such long hours that you are no longer effective'

This means that 86% of women in our sample work full-time (incorporating full-time flexi-time) whilst 14% work part-time (including part-time flexi-time). Other studies have also noted the lack of part-time working options in the IT sector in the UK, particularly in comparison to the USA (Faulkner 2002:8). WINIT respondents offer a variety of reasons for their full-time working practices¹⁷. These include 'due to children getting older', 'to get the job done', 'a preference to work full-time because there are no dependants', and 'no children'. Many respondents offered economic reasons such as 'financially supporting children at university', 'to get a full-time pension', 'husband is unemployed' and 'to eat and pay my mortgage'.

There is a clear distinction to be made between part-time working patterns and job shares. A job share is defined as a full-time post usually divided between two people (EOC 2002). 1.6% (179,000 of overall women employees) of this women works in a job sharing role (EOC 2002). This figure is relatively low but when compared with the 0.2% (19,000 of overall male employees) of men working in a job sharing role, it is obvious that many more women than men job share (EOC 2002). This said, none of the WINIT survey respondents were in a job sharing role (see Figure 10 above). We have found no evidence to suggest that the IT sector actively seeks to offer this alternative working pattern to female employees, or indeed employees of either gender, although large companies such as IBM do have in place Flexible Working Practices which include job-sharing (DTI 2005a). As Webster (2005) writes in relation to working patterns in IT,

Part-time working is very unusual in this sector, but where it does exist, it is principally done by women returning from maternity leave. We found in some cases it severely limited their progression prospects, with companies denoting part-timers from management roles and excluding them from particular client relationships (2005:4).

Job shares may enable women to work flexibly whilst retaining their professional status and possibly their access to promotion prospects, although this is by no means guaranteed given that job shares remain a form of part-time working, with all the associated problems of (perceived) low status.

To reiterate, 86% of WINIT survey respondents work full-time (including full-time, flexi-time). This is significant given that 54% of respondents have no children. Is this indicative that for women in IT full-time positions are incompatible with raising a family? A recent study (Gatrell 2005) examining changes in family and working practices identified that highly qualified working women with children are suffering hidden discrimination from their employers despite current government work-life balance initiatives. Such reluctance was recognised by WINIT respondents, with one woman (WINIT Respondent No. 7) explaining, 'It's all very well a company having a work life policy or suggesting that they will try to support part-time/flexible working. What is needed is for them to actually act on this and prove they support it. I cannot see much evidence of this at present. I would hate to leave IT but in due course I hope to start a family and this will definitely take the highest priority'.

This respondent's concerns, about the family friendly policies and practices of many IT companies are unfortunately supported by a recent report from the Institute for Employment Studies (IES) that focuses upon work-life balance policy and practice. The authors (Kodz et al 2002) identified a so-called 'take-up gap' in relation to flexible working initiatives, a gap which is not gender specific (Kodz et al 2002). Employers reported that whilst considerable effort had been made to introduce work-life balance initiatives and latent demand seemed high, take-up amongst employees had been relatively low. Kodz et al (2002) suggest that the 'take-up gap' may be occurring due to employee concerns about career prospects and progression, a pertinent concern for women in ICT who remain largely excluded from senior ICT positions. One respondent in Kodz et al's study referred to the take-up of flexible working as 'career death'. This point mirrors findings in the DTI (2004) report on flexible working in the ICT sector, in which 66% of respondents viewed part-time and reduced hours working as inconsistent with the demands of senior roles (DTI 2004:12) and 33% saw part-time work as appropriate only for those in junior positions (DTI 2004:13). One respondent to the WINIT survey wrote about her negative experiences in relation to this issue in the 'Additional Comments' text box at the end of the survey,

My career has stalled as a result of being part-time, e.g. my line manager a few years ago said "I can't give you a major responsibility because you are part-time" and a few days later "you can't get promotion because you haven't undertaken a major departmental responsibility!" (WINIT survey respondent no. 367)

This female ICT professional found herself in a frustrating 'catch-22' situation as a result of her part-time hours, but more as a result of the regressive attitudes of her line manager and the IT industry as a whole. Another WINIT respondent voices her impatience with her work colleagues who request flexible working due to caring responsibilities,

¹⁷ This additional information was provided by respondents in an additional text box attached to the 'Working patterns' question.

Many women in IT are not prepared to play the team game and want special treatment for their family commitments, and are not prepared or able to cover the peak extra hours working on a project or the support functions. It is not surprising that without playing a part in these critical roles of a project many women feel discriminated against. This is not a 9 to 5 nice office job (WINIT survey respondent no. 290).

Heavy workloads, entrenched long-hours culture and presenteeism have been identified as creating barriers to 'flexibility' however defined. Managers and co-workers reported observing unfavourable attitudes amongst co-workers who believed they had been 'left at work to carry the can' (Kodz et al 2002). In terms of the nature of WINIT respondents' employment contracts, the majority of WINIT respondents are permanent employees (66%), with 16% on short-term contracts, and the remaining on long-term contracts (6%), being self-employed (6%), working on a consultancy basis (4%) or freelance (2%).

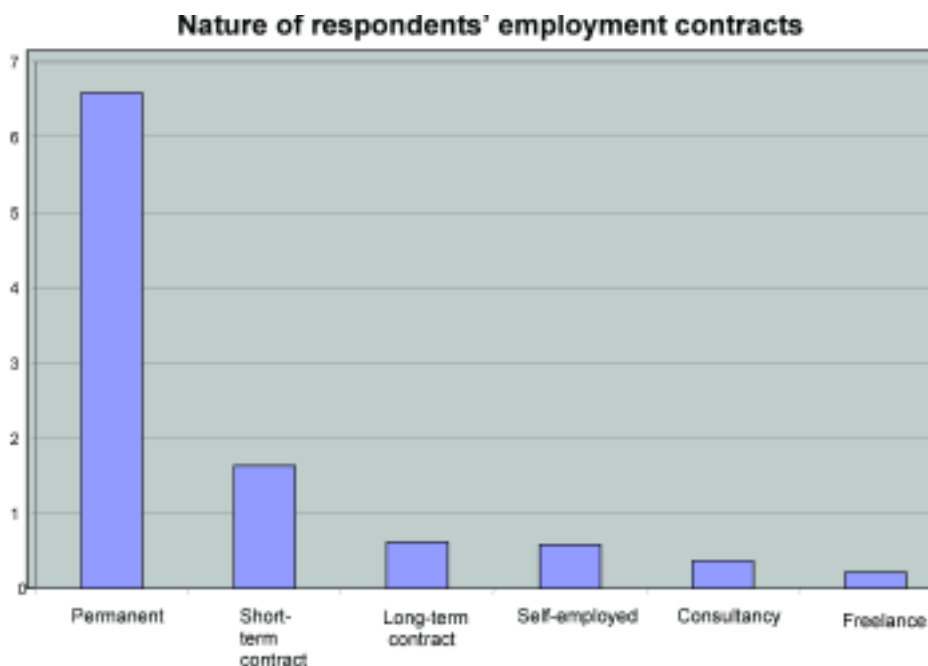


Figure 11: Nature of WINT respondents' employment contracts

The figures on the nature of WINIT respondents' employment contracts correspond to Platman and Taylor's UK figures for 2002, with 8.7% of their sample of UK IT workers being self-employed (Platman and Taylor 2004:18). Interestingly, the proportion of IT practitioners on permanent contracts declined in 2002 to 78.4%, compared to 85.1% in 1995, in the UK (Platman and Taylor 2004:19). It would appear that the women in the 2005 WINIT survey sample are less likely to be on permanent contracts (66%) than those in Platman and Taylor's 2002 sample of IT workers of both genders (78%). Grey and Healy (2004) note the growth of temporary and contract work in professional and technical areas. The distribution of these forms of work is uneven throughout the UK workforce, with Financial Services, Computing and Business Services, and Research and Development in current and former public sector industries and services experiencing the greatest proportionate increases (Purcell and Purcell 1998). In relation to the IT sector, Platman and Taylor write,

It is difficult to say whether the trends towards more 'non-standard' working arrangements will benefit IT professionals in the long-term. Replacing permanent, full-time contracts with fixed-term or short-hours contracts may simply introduce a less secure form of employment and undermine further the ability of certain professionals to remain in paid employment within the industry (2004:19) In relation to gender it is also difficult to say whether 'non-standard' working arrangements in the form of short-term contracts will be of benefit to women working in the industry. Much seems to depend on the strength, or otherwise, of the IT labour market position of the individual, with Grey and Healy (2004) noting how the women in their study benefited from contract work given that they were highly skilled and had previously worked in high status positions. These factors protected the women from the worst effects of conventional contracting work, including the uncertainty of procuring a new contract.

Of the sample of 479 respondents who specified the nature of their current or most recent organisation in terms of number of employees, 36% work in SME's (up to 250 employees) whilst only 8% are self-employed. The majority of respondents (40%) work in organisations with over 1000 employees with 9% from organisations with up to 1000 employees and 8% indicated a 'Don't Know response (see figure 12).

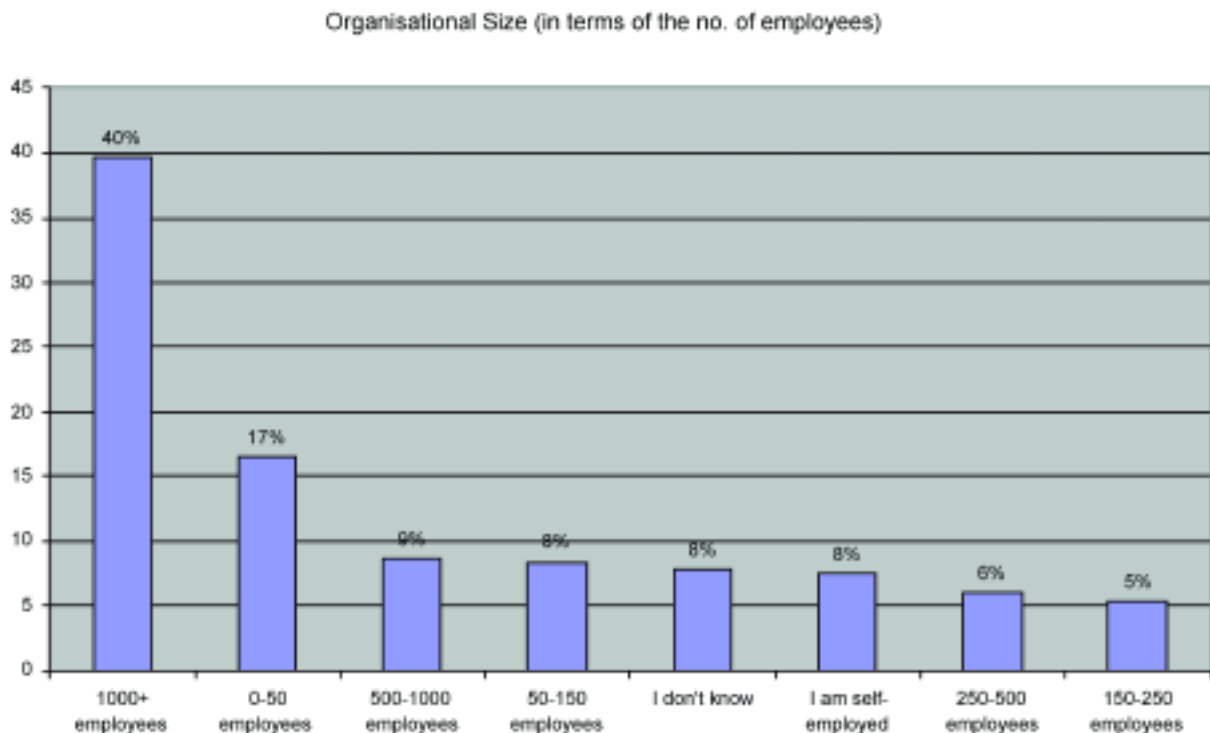


Figure 12: Organisational size (in terms of the no. of employees)

Respondents were asked about how they felt regarding the nature of their current employment. An open text box was used to collect female perceptions of the ICT industry today. This provided us with a chance to gather richer qualitative data than is possible with closed questions on women's perceptions. Many respondents commented that they perceived their situation to be 'fine', 'very happy', 'comfortable', 'I love the work and the people', 'convenient', 'I love it' and 'good conditions'. Many respondents' comments highlighted the security associated with a permanent post; 'I wouldn't want the uncertainty of freelance/contract work', 'some insecurity if I'm not made permanent' or 'I gave up a permanent IT post to take this one, so I feel insecure'.

Despite the positive comments we received from our respondents, there was a contrary trend of disappointment and dissatisfaction; 'I feel under-used and stingily metered out', 'do not enjoy the post I currently occupy', 'the extra level of hierarchy has restricted my growth in the company', 'I would like to work part-time but that option is not available to me', 'overburdening', 'potentially a great job but the workload is way beyond what should be expected', 'overworked and underpaid'. WINIT respondent no. 47, who had recently left the software industry to do a PhD, offered a snapshot of her former workplace saying, 'Too many decisions and discussions took place down the pub. I have worked in IT over the last 20 years and still had to put up with people commenting on how unusual it was to see women writing software'.

The WINIT sample of 479 female ICT professionals is a highly qualified group of women with 40% at degree level (B.A., B.Sc. and B.Eng.) and a further 36% at post-degree level (MBA, M.Sc. and Ph.D.). 14% have qualifications up to pre-degree level (A-level, Access-level and HND). 34% of the overall sample group are studying for extra qualifications (see Figure 13).

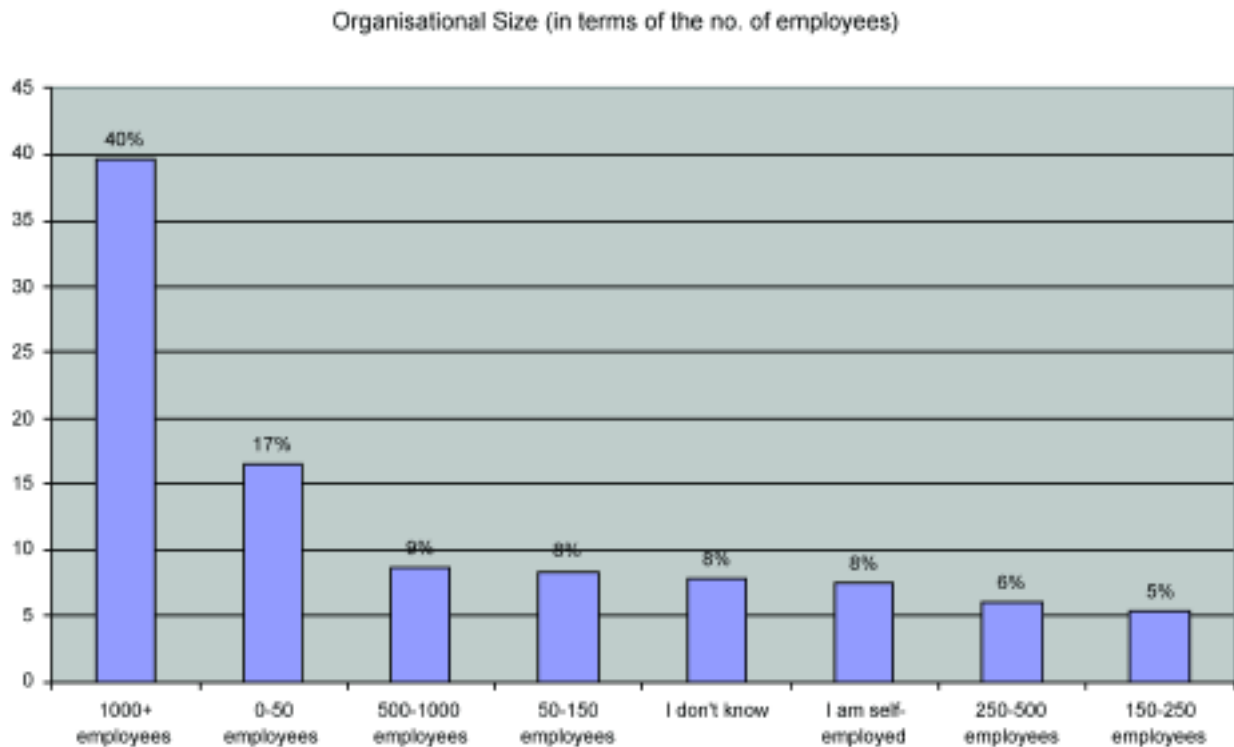


Figure 13: Highest level of qualification of WINIT respondents

Providing an overview of the situation in the UK and Scotland regarding gender and ICT, Faulkner (2002) notes how women in Information Technology, Electronics and communications (ITEC) occupations are better educated than men in ITEC occupations (2002:8). Despite their high levels of education, Faulkner (2002) highlights the fact that women in ITEC occupations are in lower status jobs than men in ITEC occupations, and (subsequently) are also paid less than men, with this pay differential increasing with occupational status: 79% for computer analysts and programmers; 86% for computer systems managers.

The WINIT survey has been targeted at women in IT so perhaps unsurprisingly 29% of our sample has their highest qualification in Computer Science. 5% have their highest qualification in Engineering and Technology and 5% in Mathematical Sciences. A further 10% read Business Studies. However many women in our sample (29%) have an educational background in what might be thought of as 'non-IT' subjects, including Social Sciences, Medical Studies, Languages, Humanities, and Management Studies. A further 22% of the WINIT sample indicated that 'none of the above' list of qualification subjects fitted their profile. We provided a comments box to capture these qualification subjects not listed. The data captured is indicative of the problems related to defining the nature of the ICT industry (Von Hellens et al 2004) and the diversity of routes into the industry. The alternative qualification subjects and hybrid subjects listed by the aforementioned 22% of WINIT respondents (who ticked 'none of the above') included Information Systems, Artificial Intelligence, Software Engineering, Computer Science with Mathematics, Combined Computer Science with French, Knowledge Management, Geographical Information Systems and Journalism. The educational profile of our respondents roughly corresponds to Wendy Faulkner's findings regarding qualifications and sector, in which she notes, 62% of graduates in ITEC jobs graduated in subjects other than ITEC. It is not clear whether this is gender differentiated or how this relates to job destination or status, but it does highlight the continued potential for non-conventional routes into ITEC occupations. On the other hand, ITEC graduates are disproportionately concentrated in ITEC jobs within the ITEC sector, which suggests that non-traditional entry will be easier in non-ITEC sectors (Faulkner 2002:8).

Many women in our survey sample (57%) did not strategically plan their career in IT, perhaps related to the non-IT routes many of them followed (at least in terms of formal qualifications) into the industry (See Figure 14).

Did you strategically plan your IT career?

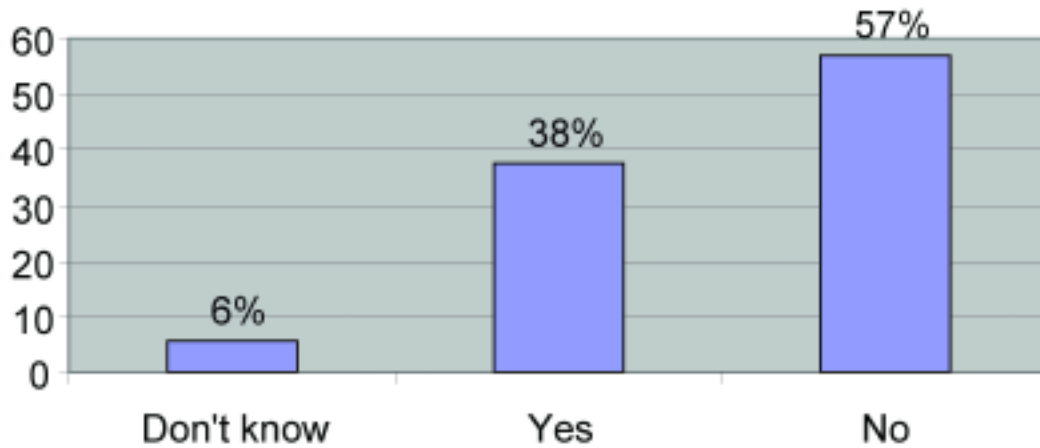


Figure 14: Whether WINIT respondents strategically planned their IT career

As a representation of the diversity of qualification subject and routes into the industry captured in the WINIT survey sample, consider this rather unusual case; one WINIT respondent, a Network Support Manager for a non-governmental organisations including the UN and the EC, had spent four years studying the viola at the Royal College of Music with a view to being a orchestral musician, before she moved into IT. She now has over 20 IT-specific qualifications and is currently studying part-time for an MSc in Data Communications.

It would seem that women's routes into the IT industry are many and varied. A sizable minority (37%) of women in the WINIT sample are also members of professional organisations, predominately the British Computer Society¹⁸, but also organisations such as Institute of Electrical and Electronic Engineers (IEEE) and the Association for Computing Machinery (ACM).

Data gathered from the WINIT sample of 479 female ICT professionals in England indicates a high level of job churn. Igharia and Greenhaus (1992) identified a similar trend nearly 15 years ago, in which they noted that management information systems (MIS) professionals 'have historically displayed a disturbing high rate of turnover that reached nearly 20% in 1987, and is about twice the average for business managers and professionals (1992:35). 25% of WINIT respondents reported that they changed jobs within the last year with a further 40% looking to change jobs in the coming year. Further evidence from the WINIT survey of women actively involved in switching their jobs is the 25% of women reporting that they have only been in their current role under 1 year, and the 29% that have been in the current role from 1 year to 3 years (see Figure 15 next page).

Staff retention has become a major issue for organisations as recruitment and is a costly exercise especially if the role requires specific on-the-job training (Van Dick 2004)

¹⁸ The predominance of the BCS is likely to be partially due to its leading position as a large professional body of the IT industry, and partly due to the fact that Dr Sue Black kindly forwarded details of the WINIT survey to members of BCSWomen. The WINIT team would like to thank Dr Black for her support.

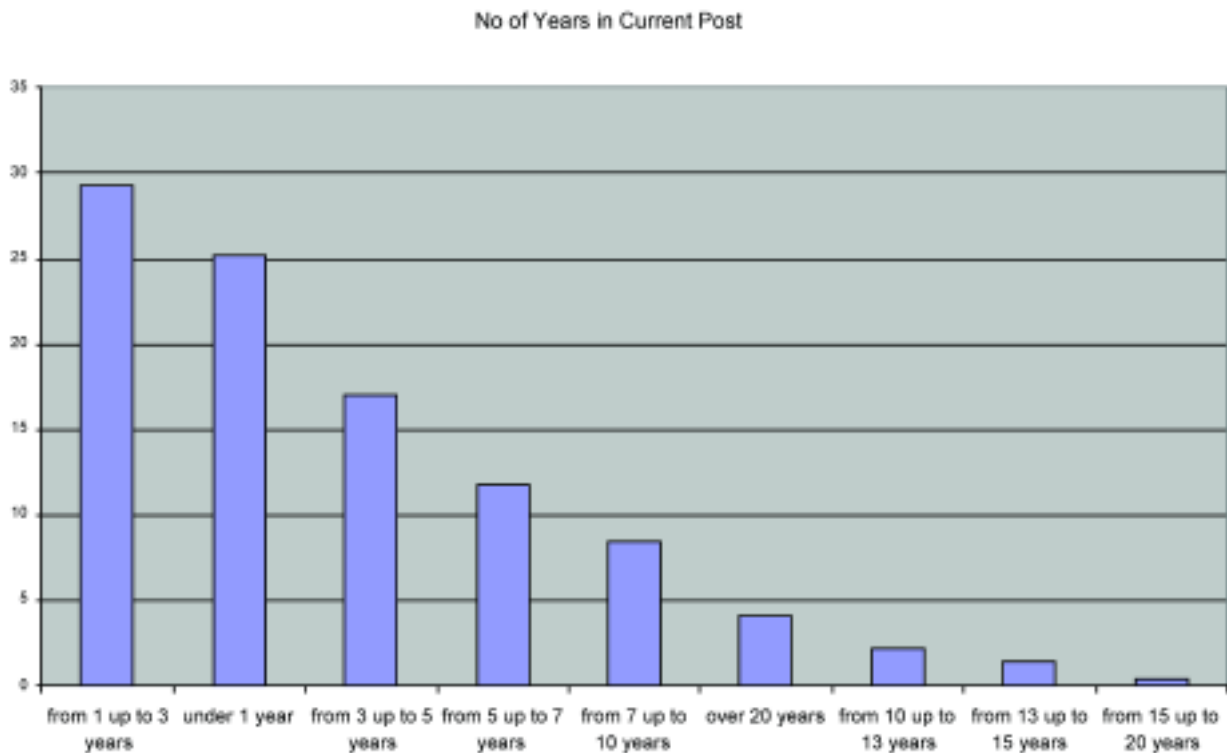


Figure 15: Number of years WINIT respondents have spent in their current post

Research from the salary specialists 'Computer Economics' indicates that the proportion of people leaving their jobs for new roles has risen from 4.6% in the last year (2004) to 7.1% in 2005 (ComputerWeekly.com 2005). This job churn or high turnover of IT staff has plagued many employers, 'resulting in a loss of productivity, delays in critical IS projects and an inability of the IT function to meet burgeoning user needs for new technologies and systems' (Agarwal et al 2001:132). The WINIT survey findings contribute additional evidence to support this high job churn within the IT sector, particularly amongst female ICT professionals. Having overcome any recruitment obstacles, women are still being excluded from core organisational activities resulting in the loss of social and material benefits from internal networks (Adam et al 2005). The issue of job satisfaction, pay satisfaction and organisation identification are suggested factors that contribute to 'turnover intention' (Van Dick et al 2004), which maybe why 25% of women in the WINIT sample had changed jobs in the last year, and 40% are looking to change jobs in the coming year.

6.4 Women's Perceptions of Their Working Environment

The WINIT survey includes probing questions to reveal women's perceptions of their working environment. Our sample group of 479 are generally satisfied with their working environment. 61% of respondents believed that their pay package reflected their workload (see Figure 16) whilst 59% believed that their pay package reflected their current skill set (see Figure 17).

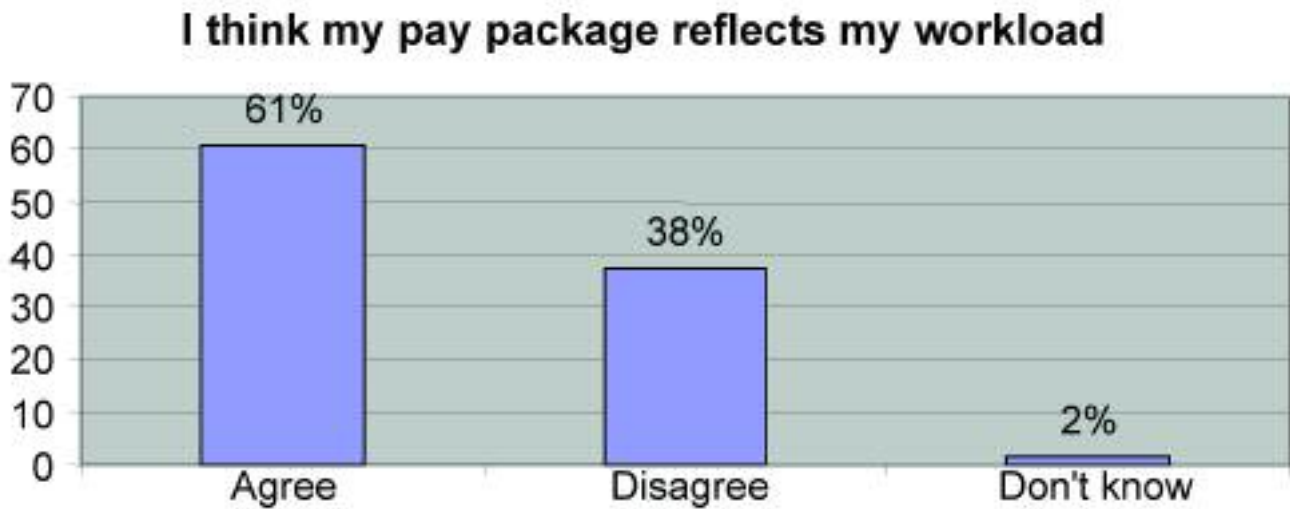


Figure 16: Number of years WINIT respondents have spent in their current post

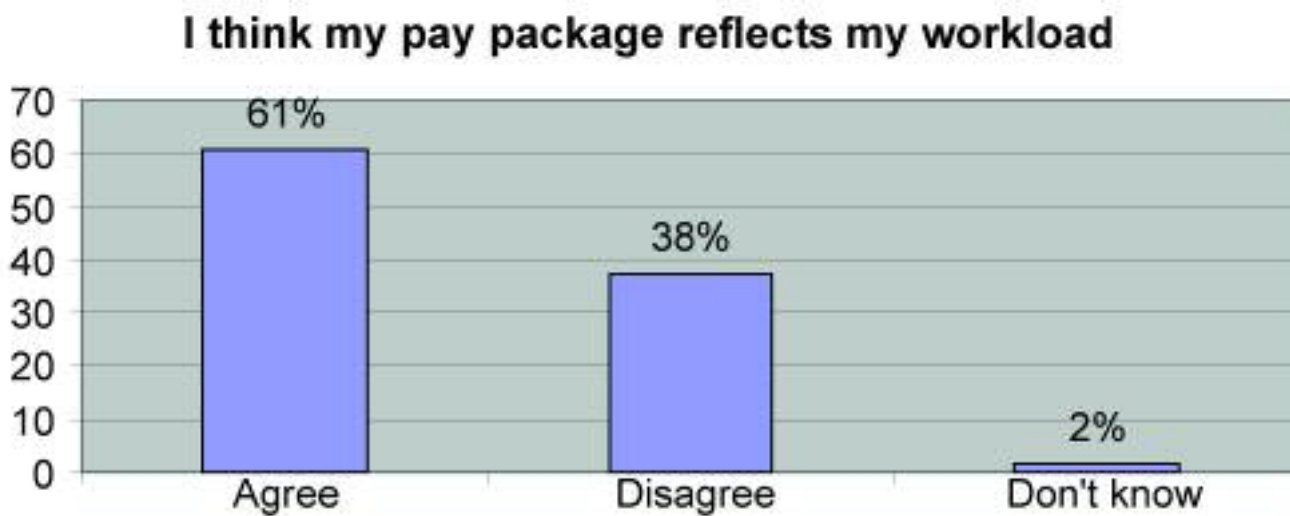


Figure 17: Pay package reflects my current skills

However, despite the majority of respondents agreeing that their pay package reflects both their workload and current skills, for both questions it must be noted that a sizeable minority (38% and 39% respectively) do not think their pay package reflects either their workload or current skills. Concerns about pay packet and workload are perhaps unsurprising if we consider the well-documented long hours culture and presenteeism that exists amongst management in the UK (Simpson 1998), and the insidious expectation of after hours working and intense working periods, often on discrete client-led projects, in prototypical new employment sectors such as software development (Hyman et al 2005).

A mismatch between pay packet and current skills (according to 39% of the WINIT respondents) is of concern, with the possibility that women are not being sufficiently remunerated for both their technical skills and their 'softer' people skills. Through empirical research Woodfield (2002) has highlighted a deep-seated problematic within the IT sector regarding female ICT professionals' skills, comprising a lack of recognition, particularly in terms of pay and rewards, women receive. Woodfield (2002) asserts that, within the organisations she studied, positive discourses uphold that 'hybrids are best/women are the best hybrids' (p.123). However she also identifies two damaging 'counter' discourses that circulate in ICT organisations. The first posits that women should 'naturally' have the 'soft' skills so integral to being a 'hybrid/bridger' worker, and consequently receive little or no recognition for their abilities in such areas. The second posits that men are 'naturally' better technicians, with technical ability and technical confidence being reassessed as ultimately more important than 'soft' skills since they 'get the deal closed' (Woodfield 2002:129). Hence, the relative merits of men and women are accessed and judged hierarchically, generally to the detriment of women given that skill sets are filtered through gender stereotypes. Woodfield's findings may go some way to explain the dissatisfaction that a sizeable minority of women in the WINIT survey sample feel regarding the link between their pay packages and current skill sets.

Moreover, only 46% of WINIT respondents agreed that their salary mirrored their highest qualification. This level of dissatisfaction may be at least in part explained by taking into account the finding that 40% of respondents are qualified at degree level and 36% are qualified at post degree level. Only 49% of the sample group perceived that their individual position in the IT industry is reflected in their pay package (see Figure 18) and 64% believe their salary reflects their position within their organisation. A sizeable minority (33%) believe their salary does not reflect their position within their organisation.

Again, both these findings (on position within the IT industry as a whole, and within each woman's organisation) are indicative of the difficulties that women in IT face in receiving sufficient recognition for their work-based efforts. Within the IT sector employment relations are highly individualised, comprising of 'a lack of trade union membership and collective bargaining...pay and conditions are often agreed bilaterally and often kept confidential from other employees' (Webster 2005:3). Given this 'salary secrets' context, it may be difficult for female (and indeed some male) IT employees to secure a pay packet which properly reflects their position within their organisation and across the IT industry as a whole, with women doubly disadvantaged by the continuing gender pay gap in the industry. There are a number of negative consequences related to the dissatisfaction voiced by a sizeable minority of women in IT, who perceive that they are not gaining proper recognition and remuneration for their workload, current skills,

I think my pay packet reflects my position in the IT industry

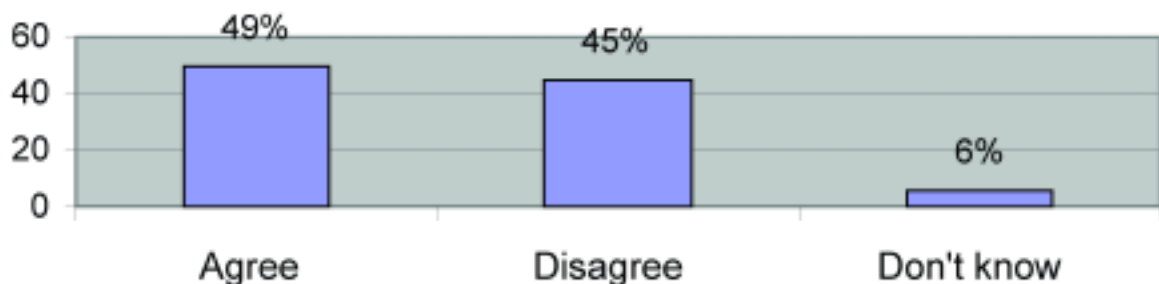


Figure 18: Pay package reflects my position in the IT industry

position with their organisation, and position within the IT industry as a whole. With more women leaving the IT sector than are being recruited (IBM 2003:3) it would seem that the dissatisfaction these women are expressing in relation to pay and rewards needs to be taken far more seriously than is currently the case. Such dissatisfaction may be indicative of deeper problems in corporate cultures of the UK given that the workplace retention of female in the IT industry is replicated in other sectors (IBM 2003:3). Whilst work-life balance policies which may help women to stay in the industry are commendable, the issue of retention of female IT professionals may also be based on their frustration with insufficient and/or unfair monetary rewards. This issue needs further exploration through research with 'disappearing women'¹⁹ who have left the IT industry and decided not to return, in order to identify both the reasons for, and the processes of, leaving the sector.

As a means to assess our respondents' perceptions of their salary, we asked whether there are any differentiating factors between their pay with that of male colleagues of a similar level. 62% said it was comparable and 77% said their female colleagues' salary was comparable, indicating a small discrepancy between (perceptions of) male and female pay amongst our sample. The WINIT team respect that the majority of women who completed the questionnaire have a positive view of pay. However, a number of women reported significant discrepancies in their own and others' pay. One WINIT survey respondent detailed how herself and her female colleagues were not equally rewarded for their work in comparison to male team members. She says, '...my pay was 40% below that of my male colleagues with similar qualifications. There were 3 women and 8 men in our team. The women were the 3 worst paid out of the 11. This cannot be explained by differences in competence or qualifications'.

Whilst 45% of WINIT respondents do not believe their pay package reflects their personal position in IT industry, 72% of our sample believed that they are valued at work (see Figure:), whilst 77% agreed that they are valued as part of a team.

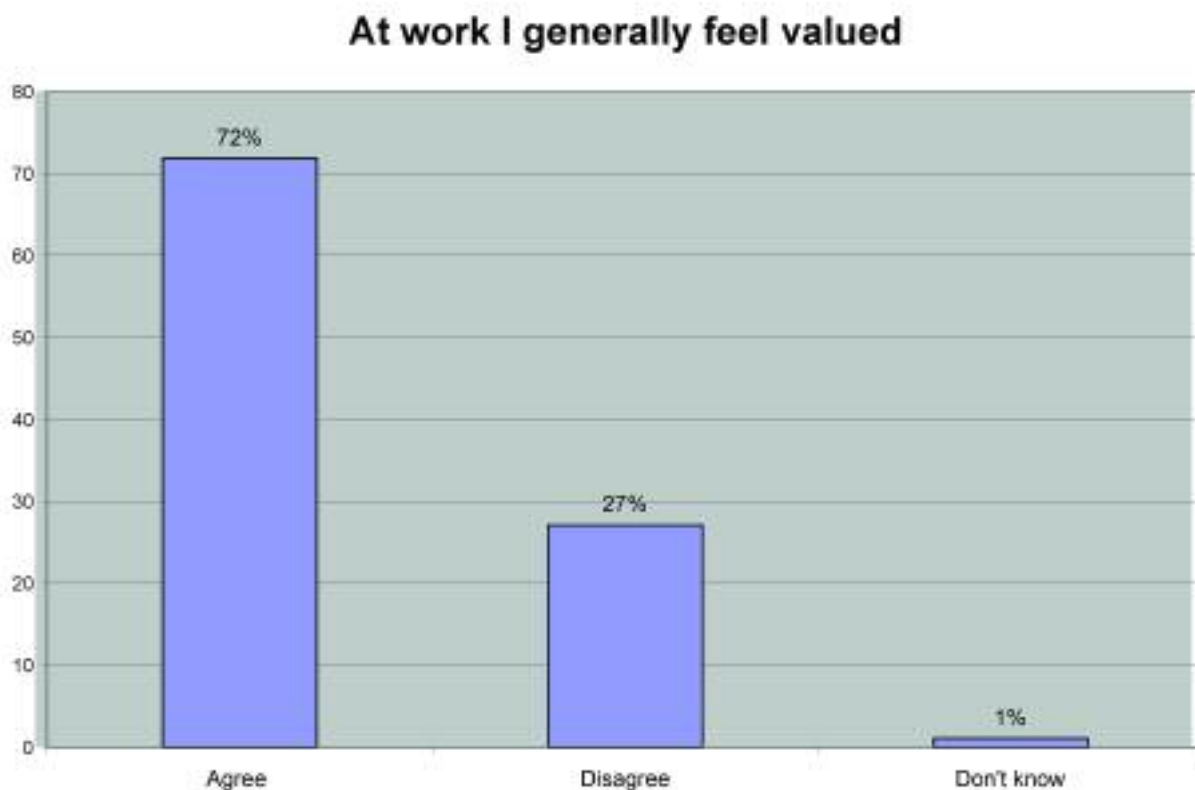


Figure 19: At work I generally feel valued

¹⁹ The ESF funded 'Disappearing Women Project: North-West ICT', commencing April 2006, will look at why women based in the region in England leave ICT, what push and pull factors contribute to high attrition rates amongst particular age groups, and what these women do after they leave the industry. For more information please contact Marie Griffiths-m.griffiths@salford.ac.uk and/or Karenza Moore-k.moore@salford.ac.uk

From these findings it would appear that although our sample group highlight pay discrepancies, and question whether they are being sufficiently rewarded on a monetary level, many do feel rewarded on a social and personnel level within their organisational context. From our survey we have thus far found relatively few adverse trends in relation to female perceptions of their working environment.

This relatively positive picture of our women's working environments conflicts somewhat with broader trends of women 'haemorrhaging' from the IT industry (IBM 2003), but may reflect the trend that this sample group do, in the majority, work full-time and in the majority have no children. The Women in IT Forum has identified the retention of older and more experienced women as vital to the IT industry and suggests that flexible working initiatives would allow more of such women to remain in the sector (DTI 2004). Given the nature of our sample, we may be providing a slightly skewed (and overly positive) view of the issues facing women in the IT industry in England.

Do long hour cultures and flexible working practices co-exist in the UK IT industry as reported in the DTI flexible working report? (DTI 2004) There are comparable findings (with the DTI report) in the WINIT survey regarding a conflict between current long-hours culture and support for work-life practices. 68% of WINIT respondents state that there are flexible working initiatives in place within their organisation.

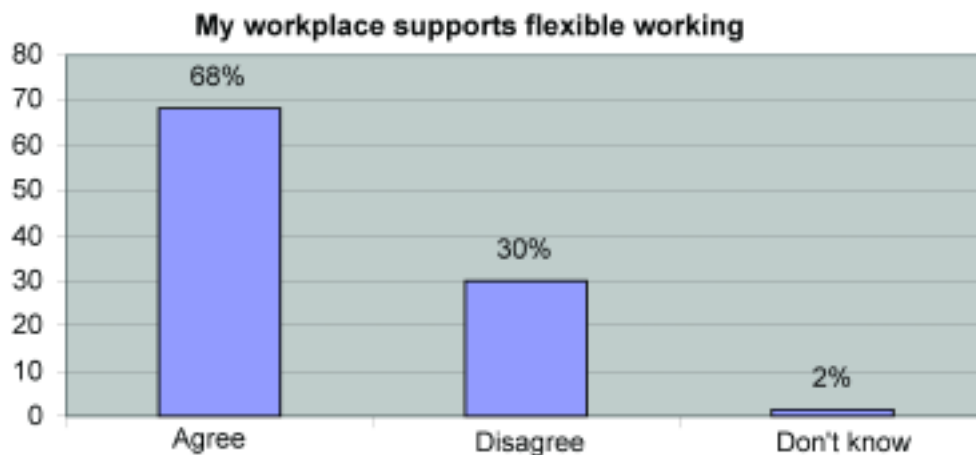


Figure 20: My workplace supports flexible working

This said, 60% of respondents report a long-hours culture within their organisation. As WINIT respondent 448 suggests, 'The long hours, after work pub culture only seeks to undermine the presence of women in the organisation'.



Figure 21: My workplace has a long-hours culture

The IT Industry DTI report (2004) claims that 51% of ICT professionals adopt a flexible working schedule, but inconsistently, the same report then states that 65% of ICT professionals are working over 10 hours a day. Respondents felt that working flexibly would lower their pay, their status and diminish their promotional opportunities (DTI 2004). This concern is also voiced by Respondent 1 in the WINIT questionnaire 'Flexible working and work-life balance is available and nominally promoted - but everyone knows its not popular with managers and in general accept that asking to work part-time will stop your career progression in its tracks.' This phenomenon is identified as the 'take-up gap' by research conducted by the Institute of Employment Studies (Kodz et al 2002).

Work-life balance initiatives such as part-time work, career breaks and job shares are in place in the IT industry, but heavy workloads and managers' negative reactions formed barriers to the 'take-up' of these options (Kodz et al 2002). Respondent 13 from the WINIT questionnaire contemplates the reality of inflexible working practices when considering starting a family 'It's all very well a company having a work life policy or suggesting they will try to support part time / flexible working. What is needed is for them to actually act on this and prove they support it. I cannot see much evidence of this at present. I would hate to leave IT but in due course I hope to start a family and this will definitely take the highest priority for me.'

Moving onto other aspects of female IT professionals' working environments which may create barriers to their career advancement, we now consider the explanatory power of the notion of 'social capital'. Tharenou (1999) argues, from her review of empirical work on human and social capital factors in the advancement of women to management positions, that lack of social capital (the ways in which individuals are embedded into organisations) may be more of a hindrance to professional women than a lack of human capital (i.e. skill and knowledge). Tharenou (1999) and Liff and Ward (2001) suggests that a lack of social capital, defined here as embeddedness in informal organisational networks), may prevent women from advancing to the top of their field. This is mirrored in initial results from the WINIT survey. WINIT respondents were asked indirectly about informal networks in the guise of an 'after work drinks culture'. 55% say that there is no after-hours drinks culture in their current workplace, although again a sizeable minority highlighted that there was, although 18% do not participate.

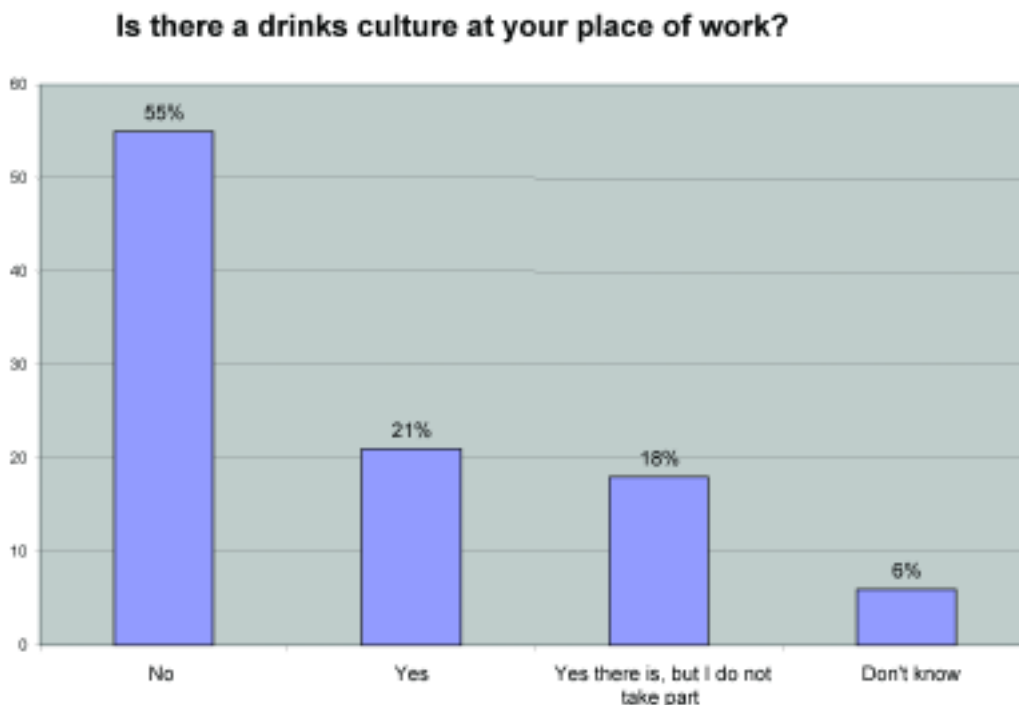


Figure 22: Is there a drinks culture at your place of work?

Of course there is nothing inherently disadvantageous to women workers with regard to the existence of an after-hours drinks culture at work. However, for women with caring responsibilities such cultures can prove difficult to participate in. The key factor is whether non-participation in such activities disadvantages non-participants. This may be the case if key workplace decisions are made in these informal (after-hours) settings. In terms of our sample, 45% believe that important decisions are being made outside office hours (see Figure 23 next page).

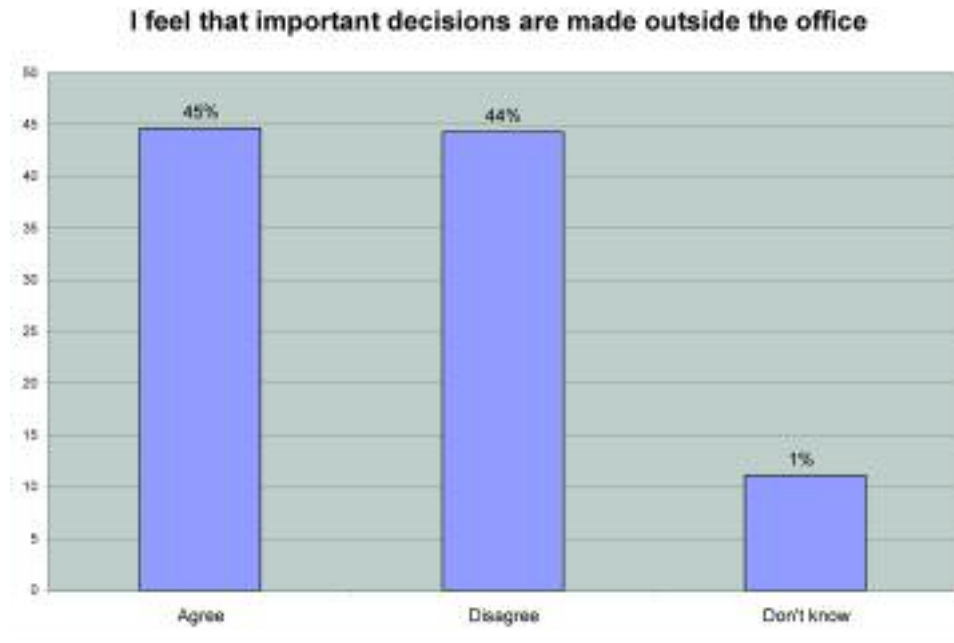


Figure 23: Important decisions are made outside the office

Such findings are indicative of a continuation of informal social networks which may exclude women especially given that men continue to dominate the IT workplace. One questionnaire respondent, a 40-45 year old software developer, offers a valuable insight into her working environment regarding progression or lack of it. She says, "Personally [sic] I found it very easy as a female to enter the IT industry. However, before long I found myself hitting that glass ceiling. I am tired of seeing male counterparts earning more than me despite them being less qualified than me. I am leaving my firm to start my own business".

WINIT respondents were asked what characteristics they perceived were needed in order to progress in the ICT industry. Liff and Ward stress the need to be 'keen and ambitious and have the right people backing you (not blocking you)' (2001:25). WINIT respondents presented a broad range of skills and experience that they perceive are required to progress in the industry. These included, 'determination', 'logical', 'persistence', 'up to date knowledge', 'technical bravado', 'enthusiasm', 'confidence and self belief' and lastly 'a good brain and the ability to mix with even the strangest people'. By using a free-text comments box we were able to capture some humorously conveyed characteristics that respondents perceive are required to progress in the ICT industry. These included, 'be a male', 'able to be one of the boys', 'to be male graduate', 'an ability to cope with mind numbing meetings at which you will most likely to be ignored', 'a tie and trousers', 'got to be better than the men :-)' and finally 'if you want money then you have to forsake a family'. Here we see how women in our sample recognise that IT work remains a 'job for the boys'.

IT work continues to be produced through gendered discourse, routine activities, gendered interactions and gendered institutions, as a 'masculinised' domain in which women must 'fit it' (Von Hellens et al 2004). If gender can be thought of as co-produced through relationships with technology and re-produced through interactions in all spheres of social life including the workplace, then it would appear that an essentialised version of 'male' gender identity continues to be placed in a superior hierarchical position to an essentialised 'female' gender identity (here within the IT workplace). From our empirical work it would appear that some women are being discouraged, or at least perceive that they are being discouraged, from being 'a woman in IT', instead experiencing gender identity conflict with pressure to act 'like a man' or act 'like an asexualised 'it' (Adam et al forthcoming). As Snitow (1990) argues, some women enter into traditional male-dominated occupations as 'conceptual men', although as Acker (1990) points out through her work on gendered organisations, individuals are never disembodied workers because they all have deeply gendered bodies. WINIT respondent No. 26 comments, 'We [women] have to be a-sexual in order to succeed in our career'. The WINIT team thought that it was important to gain insight into how women coped with in an overtly 'masculinised' domain like the IT workplace in England given the possibility of complex processes of gender identity conflicts. WINIT respondents were asked whether they felt they have to act 'masculine' to get their own way; 42% agreed with the statement, with 53% disagreeing and 4% don't know, as below.

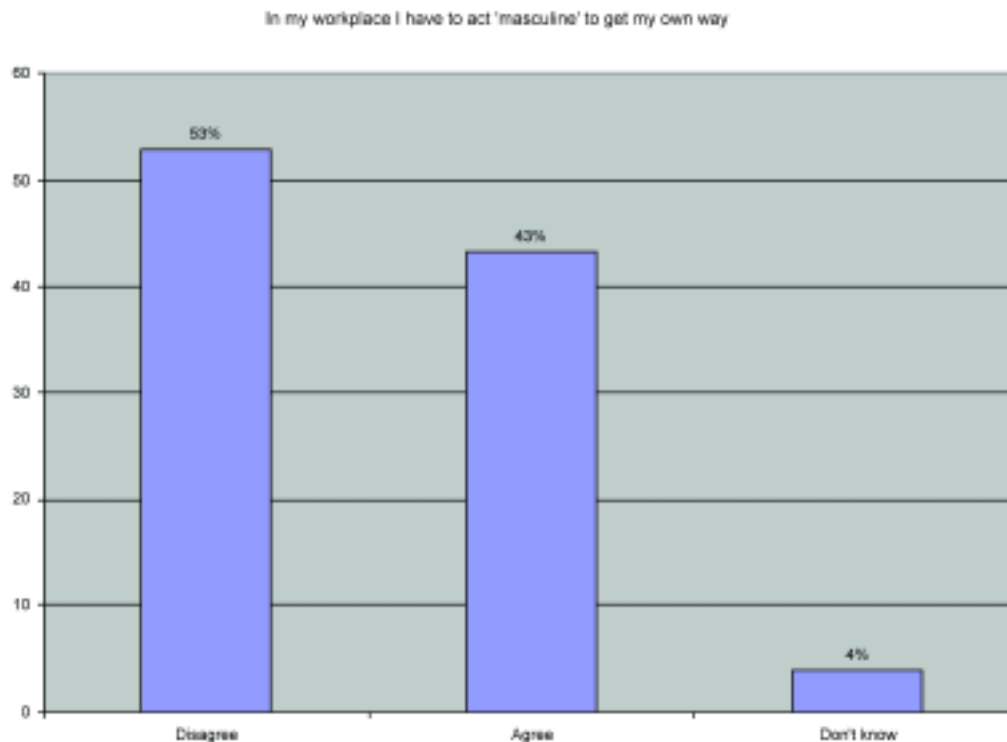


Figure 24: Acting 'masculine' to get my own way

Such findings relate to conflicts in interactions between gender identities and gendered technologies, as this comment from WINIT respondent No. 3 (who describes herself as a 'techie') demonstrates, 'There are no other females in my team, who are all programmers. All the females in IT in my company are in more-management, less-technical/non-technical roles and I detect a distaste for technical people in some of the things that some of them say. One even said outright - admittedly by way of explaining a gaffe by a technical contractor - that 'techies don't know how to relate to people'. In the face of this prejudice, it's difficult to feel confident that any diplomacy I display will ever be enough...The cultural myths that technical people are all nerdy little boys, and that women are all grown-ups with uniformly excellent social skills, are being played out all around me, and I think they do nothing but harm'.

Although lengthy we think this statement is worthy of inclusion in its entirety as it is an apt example of conflicting gender and sociotechnical (Hughes 1986) discourses, and the ways in which they are being played out in IT workplaces. This WINIT respondent is 'stuck' in a no-win situation created in part by the discursive co-production of gender and technology and the 'cultural myths' surrounding 'male' and 'female' skills and attributes. She is not 'meant' to be technical as she is a 'woman'. She is not a 'woman' because she presents herself as technical and technical IT skills are socio-culturally 'masculinised' (Faulkner 2000). She cannot 'really' be a 'woman' with social skills if she is also a woman with technical skills as these are (supposedly) mutually exclusive, one being 'female', the other 'male'. She may have social skills but she worries that these may not be 'enough' to override her primary identity as a 'techie'. Here we see how the very detail of (technical) knowledge and practice is gendered in complex and often contradictory ways (Faulkner 2000:14). Within the above quote we also see the ways in which skills attributed to 'women', be they 'social' or 'technical'²⁰, are rendered invisible, insufficient (e.g. 'it's difficult to feel confident that any diplomacy I display will ever be enough', WINIT respondent No.3), de-valued and even anomalous. On the issue of anomaly in relation to the gendering of (IT) skills, WINIT respondent 3 continues, 'In some ways, that workplace [software house] felt more friendly...I wasn't surrounded by people who wished I wasn't technical; nor did my female colleagues experience disappointment when they discovered that I didn't wish I wasn't technical!

Given the continued 'masculinisation' of IT work, and in statistical terms the male domination of the IT workplace, we thought it important to explore whether women felt supported when they raised issues about the treatment of women in their workplace. 161 women in our sample (approximately a third of the entire sample) had raised issues concerning the treatment of female employees. Of the 479 women who completed the questionnaire, why only 279 respondents chose to contribute to this

²⁰ Hughes (1986) suggested the hybrid word 'sociotechnical' to denote the 'artificiality' of the split between the 'technical' and 'social' elements of technology. Thus the starting point for social/feminist studies of technology is that the relationship between society and technology is that of a densely interactive seamless web (Hughes 1986). Here we see the implications of this normative social-technical split being played out in relation to gender identity and skills in the IT workplace.

group of questions, regarding support if raising issues or concerns regarding the treatment of female employees, is unknown. Of the 279 respondents who answered the question, 118 chose the 'not applicable' option (these respondents may be self-employed, may not have any female colleagues about which to raise concerns, or indeed feel that there were issues that needed to be raised. Figures 25-28 below present a visual representation of the full responses to this group of questions from the questionnaire,

When I raised concerns about the treatment of female employees I felt supported by my organisation

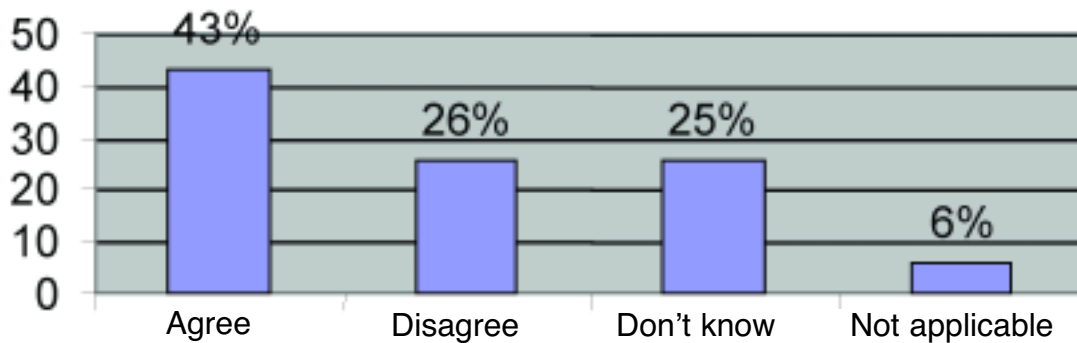


Figure 25: When I raised concerns about the treatment of female employees I felt supported by my organisation.

When I raised concerns about the treatment of female employees I felt supported by my line-manager

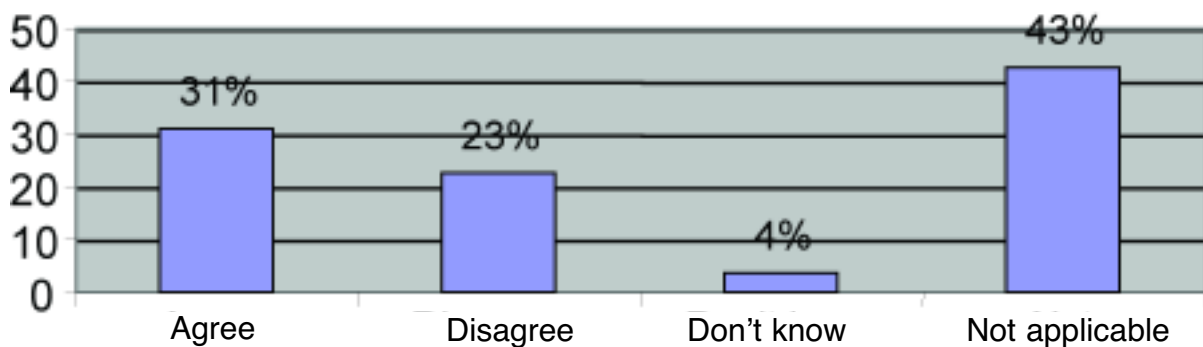


Figure 26: When I raised concerns about the treatment of female employees I felt supported by my line-manager

When I raised concerns about the treatment of female employees I felt supported by my organisation

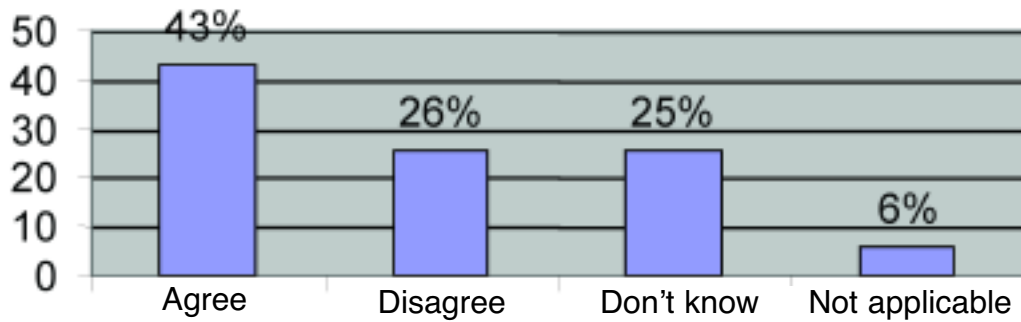


Figure 28: When I raised concerns about the treatment of female employees I felt supported by my female colleagues

When I raised concerns about the treatment of female employees I felt supported by my male colleagues

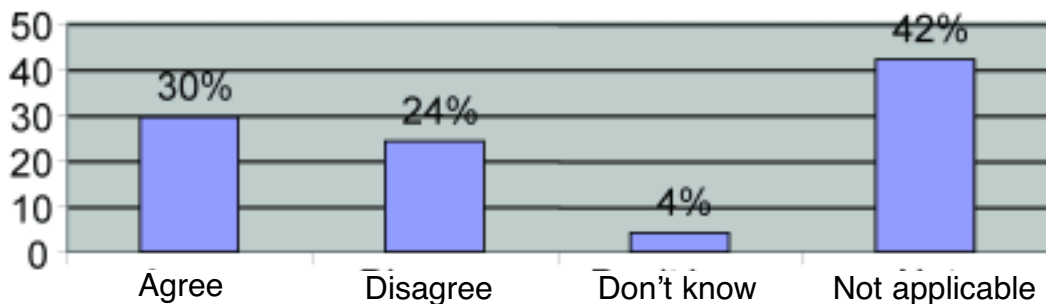


Figure 29: When I raised concerns about the treatment of female employees I felt supported by my male colleagues

The comment from Respondent 255, who felt moved enough to add this statement in an open text box at the end of the questionnaire, and who portrays a sense of isolation in a hostile environment, is telling with regards to a this lack of support for women in the IT workplace,

'I feel that the IT industry does not support mothers and the men that are in the industry tend to be young and single and the managers have wives at home to take care of children. Meetings are at times that do not suit me as a mother. My children and husband suffer incredibly because of my work commitments. I cannot speak freely about my family as not many co-workers or line manager understand my pressures'.

The issue of 'voice and silence' in organisations has been highlighted by various academic writers (Morrison and Milliken 2003, Piderit and Ashworth 2003). Support networks, perceived allies and whether the setting is 'public' or 'private' have all been identified as important in terms of whether a woman employee feels comfortable (or even able) to raise gender equity issues in the workplace. Our findings suggest that women do not perceive their organisations to be particularly supportive when such issues are raised with only 26% of the respondents agreeing that their organisations supported them.

In this section we have detailed our survey findings on female IT professionals' experiences of their workplaces, including findings relating to skills, pay, reward, and recognition, decision making processes in the workplace, and support, or otherwise, by colleagues, line-managers and organisations for gender equity issues. We now turn to the experiences of 'returners'; those women who left their ICT posts but now wish to return to work.

6.5 Moving Back: Female Returners to the ICT sector

Female returners to the ICT sector can be defined as those women who left the sector and are attempting to return. They may have left on 'voluntary' grounds to attend to family and/or caring responsibilities, or to make a lifestyle change, or they may have experienced more imposed reasons for a move out of the sector, such as redundancy, hostile working conditions or completion of contracts. There was a dedicated section included in the WINIT questionnaire to capture returners' data. The project team believe that this group of individuals, and indeed those women who have moved out of the industry with no plans to return, or 'disappearing women'²¹, offer an alternative perspective to those women who have continued to work in ICT. Unfortunately once women have moved out of the sector for a length of time attempts to sample and contact them, quantify their numbers, and record their experiences, become extremely difficult one of the limitations of our survey is that returners are a dispersed target group. However the WINIT survey did 'capture' 48 returners (who were part of our entire sample of 479 questionnaire respondents).

The returner respondents were asked to indicate reasons why they left, or were forced to leave, their last IT posts. One respondent, a 40-45 year old ex-IT Manager who left between 3 and 5 years ago, is struggling to return. She warns that we should be, "...aware of the nature of the IT industry being a fast moving sector. Women who need to take a career break will find it difficult to keep up", she has a "large gap in CV" in a "tight job market". Of those women trying to re-enter the industry, 24% were working on a purely contractual basis (and so their contracts had ended), with 14% leaving to pursue other interests, 10% having been made redundant, a further 10% leaving to attend training courses. A further 12% of the returners sample left (7% on a permanent basis, 5% on a temporary basis) due to having children. The remaining 30% left for a wide variety of (negative) reasons including being passed over for promotion, lack of progression, and sadly bullying and victimisation in the workplace.

Returner respondents were also questioned about the time that had elapsed since their last IT post. We found that 43% of female returners had left their IT post within the previous year. This indicates an unpredictable, uncertain environment for all IT workers although possibly more so for female IT workers. As Igbaria and Chidambaram noted as early as 1995, women are more likely to leave IS organisations sooner as a possible result of 'the pervasiveness of differential treatment that results in fewer or less favourable opportunities for women with regards job rewards and activities, role stressors and career experiences [which] can affect their subsequent career success in a number of ways' (Igbaria and Chidambaram 1995:170). They hypothesise that 'women will have lower levels of satisfaction and commitment, and are less likely to stay with the organisation' (Igbaria and Chidambaram 1995:170). As this 30 year old female ICT professional who has recently returned back to work after taking time out to start a family reports,

I feel that the IT industry does not support mothers and the men that are in the industry tend to be young and single and the managers have wives at home to take care of children. Meetings are at times that do not suit me as a mother. My children and husband suffer incredibly because of my work commitments. I cannot speak freely about my family as not many co-workers or my line manager understand my pressures (WINIT questionnaire respondent, returners' comments).

Again such difficulties faced by women point to support for Acker's theory of gendered organisations (Acker 1990). Being a male worker is the closest someone may come to being the 'ideal type' of the disembodied worker, with no emotions, no sexuality and no responsibilities outside of the workplace. Women, especially are at a disadvantage in the gendered organisation given that they are more likely to have unpaid responsibilities (domestic, child and elder care work). As Demaiter (2006), echoing Simpson (1990), notes 'management often perceives men as more committed to paid employment and...they are more likely to be in higher status positions within organisations (Demaiter 2006:66).

43% of WINIT returners had left their previous post in the past year, whilst a further 46% had left in the past five years. On the upper end of the timescale 3% of women wishing to return to IT work had left their last post over 20 years ago. Clearly in terms of encouraging female returners, the forms of support required by women on the upper end of the previous post timeframe are likely to be very different to those on the lower end of the scale. 51% of our female returners believe that they are experiencing difficulty re-entering the IT due to the fast moving nature of the industry.

²¹ The WINIT team were successful in securing additional ESF funding for the 'Disappearing Women in the North West: in ICT' project running from April – end Dec 2006. The research focus for this project will be asking and understanding why professional women turn their backs upon their careers in the ICT sector.

6.6 The Future Image of the ICT Industry in England

One of our aims was to explore the contemporary and future-orientated images of the IT industry, analysing how these may or may not appeal to women thinking about a career in IT or women currently in the industry. Our final empirical section relating to the WINIT survey briefly discusses findings with regards to these future images of the ICT industry in England. However, elsewhere we have written in more detail about these issues (Moore 2004, Moore et al 2006a forthcoming). We regard these future images to be important if more women are to be encouraged to enter the ICT sector in the long-term. However, to add a caveat to this interest in future image, it is important not to disregard the very real problems facing women currently in the sector. These difficulties should not be 'glossed over' in order to encourage more women into ICT in the future.

Whilst many of our respondents indicate their overall satisfaction with their ICT careers, there remain various indications that women are facing direct and indirect discrimination in the ICT workplace.

These indicators include a disproportionate number of WINIT questionnaire respondents (71%) who have male line managers, and the fact that only 1 in 5 IT workers in the UK are women (e-skills UK/Gartner 2004:54). These factors, regarding the disproportionate number of male line-managers, and the under representation of women in the IT workforce, coupled with the 56% of WINIT respondents who agreed that women were discriminated in the IT industry, portrays the somewhat adverse working conditions in which to accomplish or achieve career goals or aspirations faced by our highly qualified sample group.

Nevertheless, these remarkable women maintain an optimistic perspective in terms of their personal career trajectories. 82% said they agreed with the statement 'I can imagine myself working in the IT industry in the future' with only 14% disagreeing and a further 5% who said 'don't know' (see below).

I can imagine myself working in the IT industry in the future

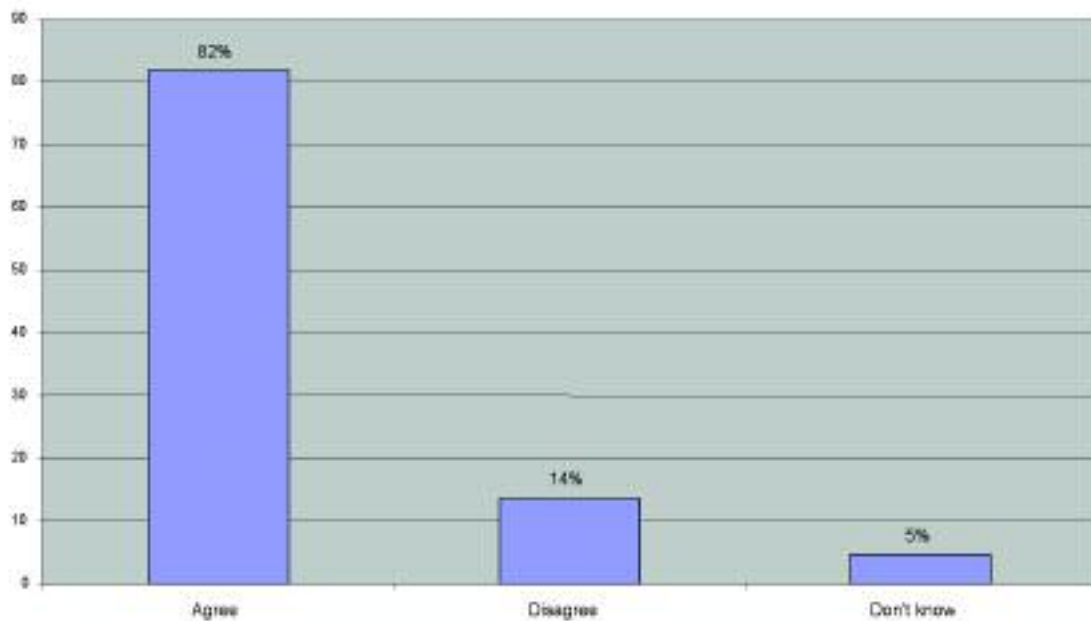


Figure 29: I can imagine myself working in the IT industry in the future

However these women's personal optimism with regard to the continuation of their presence in the ICT industry did not match their overall pessimist view that the ICT industry's image was unlikely to become more female friendly in the future. Of those women who responded to the statement 'The IT industry [will have] a female friendly image in the future', 38% agreed, 22% were undecided and answered 'don't know', leaving 41% of women disagreeing that the image of the industry would improve in the future. Within our sample who responded to the statement 'I would encourage young women/girls to enter the IT industry', 90% agreed with 7% disagreeing, and a further 3% answering 'Don't know'. It would appear then that women currently in the industry are more than willing to divulge their (partially) positive experiences to others, providing solid, experientially-based encouragement for women in England who may be considering IT as a career.

Improving the ICT industry's image to make it more 'female-friendly', whilst admirable, may be somewhat problematic. Firstly, it is difficult to say exactly what making something more 'female-friendly' involves. Here we return to our suggestion that it is vital to recognise the heterogeneity of 'women' and 'women's experiences' (McRobbie 1997a, 1997b). We recognise the possibility that what might appeal to some women will not appeal to others. In this sense it may be better to highlight the broad and varied nature of ICT work to all potential 'recruits' (including women), whilst specifically appealing for the diverse skills and attributes women (perceive themselves or are perceived to) hold.

Second, to improve the image of the IT industry in England should not involve solely concentrating on appearances and negative perceptions. The image of the industry will only change if more is done to support women (currently) working in the industry who wish to combine home and family life. It is in this sense that we require initiatives which tackle the lack of affordable child-care facilities available in IT workplaces (and of course workplaces more generally), the lack of work-life balance initiatives, and the dearth of (desirable and respected) part-time IT positions, which may suit older workers and working parents in particular (Platman and Taylor 2004). It is in this sense that the under-representation of women in IT should not be configured solely as a 'women's problem', nor an 'image problem', but as problem of the industry itself and a problem related to the (unequal) gendering of domestic and care (i.e. parental) work in the wider social world. A socio-cultural contextualisation of the problem then shifts the focus from an essentialist notion of 'woman' to the constraints of wider gendered society and gendered organisations in relational, interactional and institutional terms.

We must not lose sight of the way in which much ICT work is constructed as a 'masculinised' domain, despite the undertaking of such work by women (Von Hellens 2004:103). This 'masculinised' domain is a socio-cultural and historically-embedded construct which is incredibly difficult to challenge let alone dismantle. This is not to deny that changing the industry's image may be beneficial in terms of encouraging women to consider IT to be a viable career option. However we need to highlight that such change cannot be expected to happen overnight, not least without the support of IT corporations of all sizes, IT departments within different industry sectors, and ICT employees at all levels, particularly managerial.

7. The WINIT Online Questionnaire: Summary of Key Findings

We know briefly summarise the overall findings of the WINIT questionnaire. A more detailed conclusion can be found at the end of this project report. The majority of respondents to our online sample are relatively young women working full-time in permanent employment. As a group, the women in our survey sample are very highly qualified, and many are studying for further qualifications. The majority of women in our sample do not have children and for those women that do, their children tend to be older. This may be an indication of the incompatibility of having a full-time ICT career and raising a family. Whilst the women in our questionnaire sample perceive for the most part that they are not being discriminated against in terms of career progression, 73% have a male line manager, indicating the continuation of male dominance at senior levels in IT. However, the majority of women in our sample feel valued at work.

There would appear to be a lack of flexible working options available to the women in our sample, with part-time work being virtually non-existent. This said levels of career satisfaction are relatively high amongst our sample, although we have highlighted an under-current of resentment about current working practices, and discontent regarding the continued masculinisation of more 'technical' IT work which perpetuates a hostile working environment. Despite the majority of women in our sample indicating that flexible working practices exist in their workplace, 60% indicated that there is also a long hour culture.

The women in our questionnaire sample are a heterogeneous group from a variety of educational backgrounds in a broad range of positions at all levels within the IT industry in England. Attention to this heterogeneity provides us with a nuanced view of women's experiences in the IT industry and offers a solid base on which to build further WINIT research. We have highlighted the pitfalls of assuming that gender is a static term or assigned role (Wharton 2005) and have demonstrated that by conceiving gender as a relational term we can explore how it is constructed in relation to technologies and workplace skills, which may be viewed as 'masculine' or 'feminine' in an unequal hierarchy. The under-representation of women in the ICT industry as highlighted by the liberal feminist position clearly needs to be tackled. However, we have demonstrated in this paper that we also need to use other feminist approaches to gender and technology (Faulkner 2000) in order to trouble these two inter-related terms. In so doing we can tackle the issue of under-representation without assuming that simply encouraging more women into the industry, say by improving its image, will be sufficient to tackle the continued complicated socio-cultural construction of IT as a masculinised domain.

8. WINIT Interview Data: Vignettes of Women's Lives

The following 'vignettes' introduce each of the nineteen WINIT interview participants to the reader. We felt this to be important to offer the reader a certain degree of background information on each of our participants, and to bring alive the stories they tell.

Petra is a self-assured 55-60 year old women, with a multi-million pound ICT recruitment business focusing on Software Testers. She lives in Surrey with two adult children, both of whom had attended university. Petra had attended university in the 1960s. Petra had set up her recruitment consultancy with a male business partner and it has grown into a multi-million pound venture. Petra's husband also had a senior position in the company he worked for. Petra's house is very large and tastefully decorated, and Petra herself was immaculately turned-out. Petra perceives herself as being near retirement age. She plans to keep her business in the near future, but said she would probably sell it in the long term to her business partner who is about ten years younger than her. She is interested in doing knitting design and manufacturing so she is considering transferring her management and business skills to that field. She is also currently writing poetry and is also considering developing her interest in that area. Petra was a highly eloquent and enthusiastic women who spoke wittily about some of the difficulties she had faced as a woman throughout her career, particularly as a young mother attempting to juggle child care and a burgeoning ICT career.

Jill is a no-nonsense 55-60 year old women earning a six-figure sum earner as IT director in a top London law firm. She is also on the board of the firm. Recounts how she rises at 5am every morning and is often at her desk around 7am. She worked extremely long hours but said she did this mostly out of choice. Jill did not have children but did not indicate whether that was a voluntary decision. She did have elderly parents who needed considerable care but her husband, a school teacher, provided most of the time investment needed. Jill said she loved her work, and expected high levels of commitment to their roles from those she managed (i.e. her IT team). She also relished the challenge of dealing with often obdurate lawyers, day in, day out. Jill says with considerable rancour that women become inflexible when they have families, and that in the IT industry and IT in non-IT sectors it is not possible to be inflexible, given the vital (and often project-central) role of IT especially in non-IT businesses. She envisages that in the future senior IT people would run the direction of non-IT organisations and be more involved in business related decisions given the vital role of technology in facilitating all business functions. Jill had recently returned to her law firm IT job following some time setting up her own consultancy company. She says she wants to finish her career in this particular law firm. She does consultancy work for her own business one day a week and it is this role that she thinks she will continue to do when she leaves the law firm, although she did not envisage leaving in the near future. However she is already 'moulding' someone to take over her role at the law firm. She has a dynamic, energetic and forceful personality and she feels that she would prefer to be working than retire soon.

Cass is a friendly and competent 55-60 year old very recently retired women who had a lengthy and high-level career in IT, predominately in the City of London. She lived in a pretty village in the Home Counties with her husband. She had been part of a study of women in ICT undertaken by Kent University many years ago, and was interested in participating as she still thought women experienced difficulties working in the field. Cass was particularly concerned about the trend for ICT work to be outsourced to countries that she thought did not have good equal opportunity records (i.e. India). Cass undertook a teaching qualification at the start of her working life as she perceived that it was a suitable career for a woman. However, she intensely disliked teaching and left to undertake a Higher National Diploma in Computing and Maths. After gaining this qualification she joined a large British engineering firm as a filing clerk but was soon moved to the "all male" IT department. She then left to work in the fledgling IT department of a large City-based firm, before being headhunted by the London Stock Exchange, where she managed a team of 30-40 men and worked extremely long hours, often staying in the office overnight. Following marriage she joined F International, an IT company set up and run by a woman, Steve Shirley. F International was mindful of many women's family commitments, enabling Cass to continue working (part-time, although she did work full-time at points) whilst she helped with her husband's business and had children. She then moved away from technical work into management roles, and was ultimately involved in overseeing multi-million pound IT contracts. Following her recent retirement, Cass is hoping to do non-IT related voluntary work and was considering consultancy work.

Lizzy is a highly qualified 30-34 year old chartered mechanical engineer living in the North of England. She holds an Advanced Course in Design Manufacturing Management (ACDMM) from Cambridge and she also has a PhD in Fluid Dynamics. She has been employed by various engineering firms as Project Engineer, and works voluntarily on an occasional basis for a commercial space flight company. Following several negative experiences in the engineering field, predominately as a result of sexist and discriminatory attitudes of male colleagues, she set up her own IT business with her partner. She has predominately self-taught IT skills. Five years on their joint venture is profitable and Lizzy has greatly expanded her knowledge of IT using them to interrogate data via a customised software package they developed for their business clients. Lizzy does not currently have children. She and her partner are considering marriage.

Barbara a go-getting, 26 year old woman, owns a computer re-selling and distribution business with her partner. Neither university educated, nor technically qualified her driving ambition is 'a massive house and a flash car'. Perceiving that in the past she had 'disappointed her father', her other source of motivation includes 'determination to succeed and try to prove to him wrong'. Barbara's ICT sales career started at 17 years of age, having been told 'to get into IT because you will earn loads of money'. She established herself as the 'youngest product manager' with the 'highest wage' at 19 in South-East England. Circumstances, including an offer of higher wages, induced a move to Northern England to a company where again she was the 'only girl who worked there apart from the receptionist'. In career-terms she thrived in this environment, saying, 'they hated me and I pulled all their big accounts'. She was subsequently sacked just before she was meant to collect £100,000 commission. This proved a turning-point in Barbara's career trajectory. In an example of her determined attitude she says, 'I said what better opportunity have we got' and consequently she started her own business with her long-term partner. Two-years later, their re-selling and distribution business is an award winning success story. In addition she recently set up a woman's ICT training forum. Barbara works seven days a week. In relation to starting a family she says, 'I would love to have kids and then I think I'd have to have a day off'.

Rhonda is a quietly confident 40-45 year old Systems Analysis (at the time of the interview): Rhonda found herself making life choices once her two children reached a reasonable school age. Leaving a part-time dental nurse role and part-time work at the local 'corner-shop' Rhonda returned to higher education as a mature student on a Business and Information Systems degree course without any knowledge of 'what to do with a key board'. This was a demanding and challenging period both emotionally and financially as her husband was made redundant which almost forced Rhonda back to paid work. A year long work placement at a local NHS district hospital became influential on future her working professional ethics. Once Rhonda graduated, thought a return to her previous NHS role was not an option, a systems analysis post at a privately owned software house brought new challenges. The organisation wrote and supported financial related insurance software and was rapidly expanding. The company was founded with the MD and an all male team and they recruited as and when in an ad hoc manner with little regard of policy's and working procedures until the MD's daughter was recruited as the HRM director. An indication to the diversity of the workforce is that the company only had male toilets until the mid 1990's. This was a masculine dominated culture with a hostile working environment but Rhonda progressed with her IT expertise and communication skills to team leader of the Business Analysis Division. Rhonda has had a constant battle throughout her time at the organisation having to justify status and to prove herself as a professional facing comments 'I wish all I had to do was flutter my eyelashes' if ever she achieved anything. In terms of her own future, she questioned the ethical and social aspects of her work, saying that she didn't feel that "working to make a rich man richer" was enough of a career incentive for her. In the future she was considering returning back to her not-for-profit career route. (The WINIT team recently met up with Rhonda and were quickly updated on recent events since we all last met. Rhonda has returned to the NHS and much more satisfied even though she faces a three hour train journey to and from work every day, a decisive gender related incident meant that staying at the organisation became untenable. Rhonda was a key witness at a tribunal for unfair dismissal, and a campaign of bullying and intimidation was revealed. The ex-female colleague was successful in her claim and Rhonda left the organisation immediately.

Illiza a passionate and hard working 35 - 40 year old is currently Director of ICT in a charitable organisation and planning to undertake an MBA, Illiza's ICT career began when she became a single mother of three children at the age of thirty when she watched a computer being built. Exploring the options available to her, she decided on a career in ICT, gaining thirty-eight qualifications in five years whilst she worked in administrative roles, she openly admits to being an 'exam junkie'. Strategically not applying for ICT roles until highly qualified, Illiza's career began in earnest with the offer of Head of ICT as her first ICT post. She recounts how she 'went home and cried and cried because she thought, my God, I am never going to be able to do this'. Her hectic professional life is coupled in an equally eventful domestic life, with a family of five ranging from eighteen years of age to a new born child. She is supported by an extended family. She admits that twenty-three hour days are not unusual, and that she has not 'quite got the balance right between my family and my career because my career

seems to take precedence at the moment'. Her style of management is one of mentoring and empowering individuals, 'bringing people on' so that they can support the business if she is not there. This style of management is questioned by others concerned that in doing that Illizas's position maybe threatened but she embraces this challenge because it indicates ambition drive and it is how she works. At the start of her current post there was unconcealed disapproval from members of the IT team, one member wanted her to 'prove her worth' but Illiza said no, she had done that and got the job, if that was not acceptable they could leave. Bridges have been built and the team are highly respectful of this straightforward highly qualified women. Illiza is currently reflecting on her past experiences and making plans for the future. She aims to publish a technical book, but also wishes to move towards a situations whereby 'work is centred around the family, because I feel I have neglected the family they have paid the price'. This dynamic, driven and honest woman admits that she has not managed to achieve a work-family balance However, she states that now her professional reputation is established, she is better able to contemplate the future of her family, aiming to 'be there, especially for the younger ones'. In the future she planned to reconsider the balance between her caring responsibilities and her career. She perceived that she had sacrificed her previous marriage and time spent with her older children.

Lottie is a creative 35 to 40 year old Web Designer who has recently moved to the UK from the America with her family. The move was instigated through re-location of her husband's job. Lottie was in the fortunate position of being able to bring her work with her as she designed and hosted web sites, she made the comment that she always use to say 'I can work anywhere in the world as long as there is broadband' and this has been put to the test. She continues to maintain her American clients as normal even making new clients state side while she has been UK based as her work is found largely through referrals of existing clients. New clients have also been made locally but Lottie is conscious that her work will fit around her family. A move from the city to a rural setting mirrors a drop in momentum with Lottie's career as she moved from working full-time in an academic post in the medical sector to a part time web designer, this downsizing occurred while she was still located in America. Now working from home Lottie has also started writing a book and is beginning to test her poetry skills. A work life balance is a priority and she aims to match her workload accordingly having managed her family around her work for many years.

Natalie a disheartened 30-35 year old women working for a public sector organisation in an IT support role. A young mother of one with hopes of extending her family is finding her current working situation is simple making her ill, at the time of the interview she was on sick leave due to stress-related symptoms. Moving from her three year IT support work (help desk work) onto much wanted management post in the network team, after six months she became pregnant. There was a desire and some added pressure to maintain contact throughout her maternity leave and on her return she was still breast feeding, coping with sleepless nights and missing her baby. After a few months negotiation some home working had been organised which resulted in being 'out of the loop' and being 'passed over' a lot of the technical work was being dealt with buy her male colleague. After 'strugglin and jugglin' a move sideways to Data base administrator found her on a higher salary in comparison to her male colleague who felt threatened by her presence. Nadia became upset as she recalled the circumstance of her working conditions. Talking very quietly yet determined to voice some of her experiences she asked at certain points for the recorders to be turned off as she collected herself. The interview process was poignant for all concerned, Natalie instigated the meeting and invited us into her home and she was determined to contribute to this research. Though highly skilled, experienced and personable she questioned her future in IT firstly given the lack of support by her managers in the face of bullying by a colleague. The intimidation that was targeted at Natalie manifested itself in a silence routine by a colleague who held a similar position, and started after Natalie, for some reason he became immediately hostile. The hostility was perturbing as it was delivered 'invisibly' just to Natalie; her bullying colleague ensured that to the outside world there was no problem, she could not 'make it tangible'. One to one he basically ignored her which began to impact on how she managed her work. This hidden hostility was difficult to report upon without looking irrational, she is at a no win situation. These traumatic experiences have led her to consider leaving her role and retraining in homeopathic medicine and/or organic gardening. She felt that IT work was "feeding my brain but not feeding my soul".

Josie is a highly accomplished 35-40 year old woman working as Head of IT for a charitable organisation. Her current role is a very recent one but she is already planning her next move. The role is very fulfilling and challenging but the four hours commute to work and from work is not practical and because the organisation has recently expanded Josie intends to have her IT department in order before she hands it over. The IT responsibilities are critical as there are 16 sites requiring support including 4 hotels Josie enjoys this part of the role because at her previous company she had 'all the responsibility and none of the power'. Having worked for just three organisations throughout her career the first company was in the financial sector and she stayed 13 years moving from department and finding a home in the IT department were at one stage there was 1500 employees. Starting as a programmer and developer she had a talent for 'bashing it out' but a move to Project

management (eventually managing a team of 50) replaced technical skills with strategic and people skills. There was no obvious discrimination which she was aware of but redundancy packages indicated that her salary was significantly less than colleagues who were equal on status, skills and years at the company but they were male which she found 'upsetting'. The company also motivated an aversion to long hours, her manager started at 7 and left at 7 every day, there was a 25 hour 'official' overtime arranged into their contracts. It was a constant battle to fight presenteeism she started early and finished on time and would argue that long hours is counterproductive. In her current role her staff are 'shooed' out at 5 and she gets annoyed with them as they work long hours. Her next role at an IT consultancy with a staff of 10 had major differences, the transition was predicted to be difficult after being with a large global conglomerate for so long as Josie had little confidence and was nervous of the IT sector outside the safety of the larger organisation but with an 'enlightened' MD who worked a strict 9-5 with an hour away from the desk at lunch her confidence grew. Part of her role was going into IT companies and advising about processes, product life cycles, review procedures which broadened her skill set and professional esteem hugely. A three year period at the consultancy was always at a precarious position Josie was ready for a new challenge. Her reason position required her to negotiate time for her horses and her work with cub scouts which she did. Though Josie does not have children she still requires a flexible working. Josie's future tactic is to remain in IT but at a more senior level in a larger company, she has no plans yet to wind down and has enjoyed her career in IT so far.

Rosie a highly experienced 20–35 year old new mother of two is pessimistic about her future. Working in the same chemical manufacturing company for the majority of her career has enabled a rapid progression for this professional hard working individual. Heading the SAP roll out at a European level Rosie embraced the huge challenges and responsibilities that this role brought which often involved long periods away from home. An understanding line manager mentored and guided Rosie in her successful career and was very understanding after the birth of her first child enabled a feasible work life balance. The organisation has recently been through another merger and Rosie is now very despondent and pessimistic about her future she now perceives that she is in a no-win situation. Her mentor had left the organisation some time earlier and Rosie alongside two male colleagues managed a sector. This was problematic due to different management styles there were instances of being her being actively blocked, not fully informing her of what was going on a sense of 'ganging up' the situation was intimidating and very unstable as she left for maternity leave with her second child. Whilst on maternity leave there were changes in staffing, one of her male colleagues left and the other was promoted and became her superior. On her return she has been struggling to keep her work-life balance, her new manager did not want her to do flexible working even though he is a new father himself he has been unsympathetic to her needs, and Rosie has been using holidays to reduce her working week with hope that an arrangement will be negotiated. Currently there is a stalemate she has been working in the same company for 16 years, and although initially they were receptive to flexible working due to her new Mum status, this has changed with her second child, she feels stressed and unhappy going to work every morning. Rosie feels that she has been overlooked for promotion and progression within the company and is unsure of her future there and has not been offered any project work since she left for maternity leave her position is untenable. It appears all of her years of expertise and skills are being completely ignored her new manager says 'we know you want a project management role, we know that, but the opportunities are not there for you to come in and manage the whole caboodle. He's actually saying get a skill, you'll then at least be considered and there's some opportunities it could work out great but I'm hating it'. This experienced IT professional is struggling to understand why she is being overlooked and under-utilised, she is now updating her CV and looking to find work locally without the status, responsibility and salary the situation has left her totally demoralised.

Gaynor a highly motivated, 27-year old Business Consultant in London, has rapidly climbed the ICT career ladder. Working for a global organisation in a pre-dominantly male environment, she is 'much more visible. I am remembered a lot more'. Essential networking and negotiation skills have also contributed to ensuring her selection in an aggressive internal recruitment market. She is ambitious, has high expectations of herself and her career, and works hard. This combination has enabled her progression from junior software developer to general management status over a six-year period. Gaynor's current role requires longer periods away from home. Extra responsibilities have brought added pressure to Gaynor's life, and some uncertainty about the future, 'I have no idea where it will go. I will either get used to it...some days I think why am I doing this.' Involvement in the company's 'ridiculously long-hours' culture of 12-hour days and attending evening team meetings leaves Gaynor little time for life beyond work, 'I barely have time to look after myself'. Secure in a relationship, her partner is in a similar IS role but in the public sector. Gaynor says, with regards to having a family in the future, that 'I honestly can't see how I'd do it [the job] with children and spend any time with them'. In the meantime Gaynor is happy to spend some of her earnings on her passion; exotic scuba-diving holidays.

Lillian a motivated 55-60 years age had on at time of the interview been recruited to a new IS manager role in a manufacturing firm (specialising in obstetrics). She felt stagnated in current role (senior management) having been attached to the same small company for 5 years, there was no career progression available. And there was a three and a half hour drive to and from work. There had been opportunity for Lillian to work from home but she was a people person and enjoyed being available actually describing herself as a 'long hour person'. A mother of two grown p children Lillian continued top work part-time and then full time as the children got older though she believes that her self-imposed career gap ahs impact upon her earning potential and limited her career prospects she did not resent how her career trajectory. There were always computers in the home due to her husbands work and because of this Lillian believes she was able to collect skills when the children were younger though there must have been a level of personal motivation and ambition involved. The new role is a twenty minute drive away and she sees it as a sideways move but there is the flexibility to progress as the organisation is large. The recruitment process though daunting was straight forward but Lillian removed her date of birth from her CV as see perceived this hindering her recruitment campaign. The technical skills and business experience gained her an interview and then she got the job. Age she considers may have helped as she is replacing a younger male IS manager who was leaving due to personal issues. Ironically Lillian was recruiting for her replacement and did not consider anybody over the age of 40 she has employed a mid 30's male with not very much business experience!

Donna is a disheartened 29 year old women software designer in the telesales sector and has the misfortune to have been redundant three times in her short career in IT, every two years since she graduated. This has had a negative impacted on perception of the IT sector as she had a fantastic experience in her first posts once she graduated. Donna has an easy relationship with technology as her mother was a Network Administrator. Arriving at University on a computer course, from an all-girls school she was shocked at the gender imbalance but not fazed, she was 'passionate about computers'. A graduate placement with a major reseller where her role was 'trouble shooting' and solution based the momentum was dynamic, the ultimate environment for a career hungry bright women. Two years into this post the company was bought out by a multinational and Donna was made redundant but she was successful in reapplying for a new post. There was a good ethos in the newly formed company but the commercial viability was questioned as the new company manufactured IT not provided solutions. Donna was recruited onto a small (3) project driven graduate team with the task of gathering 'cutting edge knowledge'. The role came with major responsibilities to deliver innovation and involved international travel and a hectic schedule, again Donna thrived in these working conditions. Redundancy loomed after a two year period and Donna soon found work in the Digital CCTV sector. The position held a lower status than she was used to but commanded a higher salary; a promotion to senior software designer soon came though. After a two year period there was the option to take voluntary redundancy which Donna took and re-located. By this time Donna was becoming despondent with the IT sector, and after a great career start is becoming totally disillusioned. A new short term contract in the telecommunications sector finds Donna not progressing but side stepping in her career now without the stability of a full-time contract 'back where she started'. Currently in a long-term relationship and planning a family, Donna is questioning staying in IT having experienced the long-hours and at times a stressful 'hellish life' she believes her 'passion is going' for computers.

Katie a straightforward 50-55 year old lecturer at a FE-college with an interest in mathematics and sciences throughout her school years was encouraged by her father and school teachers to pursue a degree in mathematics. She considered herself logical and technically minded and there was evidence of this in the presence of a home wireless network that she was in the middle of setting up in her newly acquired home together with various pieces of hardware scattered around the house. On starting Polytechnic Katie found herself one of a couple of women in a sea of men which she did not find intimidating, actually meeting her future partner on the degree course. Interestingly they both finished the course and joined the workforce with comparable qualifications and expertise. They both entered the work force and Katie experienced no problems obtaining work and she enjoyed the technical aspects of her first position. A family had been planned (a joint decision between herself and her partner) and Katie soon found herself at home with two small children but managed to obtain some part-time work in IT once the children began school. Her relationship broke down and Katie found herself alone with two grown-up children, her personal future was uncertain because she had an extended career break. An imposed re-location due to her circumstances Katie re-entered the job market by teaching IT in a college in a low status low paid position in comparison to her partner who had obviously not had a career break and now commanding a considerable salary. Katie was a little despondent about her financial future but was experiencing a new independence which she enjoyed.

Madge a highly ambitious 30-35 year old recruiter specialising in IT. Serendipity via a change of job internally has moved this recruiter to managing a high profile web-site. Transferable project management skills have been applied effectively and the web-sites presence has been significant in a short timeframe. Her time is split 50-50, half her workload is in recruiting, placing IT professional within the financial sector requiring an intricate knowledge of industry. The remainder of her time is managing a rapidly evolving web-site which requires technical and creative skills alongside an implicit familiarity of her target audience. Obviously working long hours to achieve the corporate objectives it is hard to gain a true insight into the personal side of this fiercely, ambitious women. What is obvious though is that Madge is focussed and determined to be successful

Finalia a motivated 27 year old Business Analysis is currently employed in a rapidly expanding telecommunication start-up company. It was not the first choice of degree attendance to an all-girl's fee-paying school her parent hoped she would continue the family tradition and become a doctor but poor exam results stopped these aspirations. A vocational degree was preferable so ensuring employability at the end of the course. Finalia hated the first year from an academic point of view because it was so technical as the course progressed she the business and strategy aspects interested her much more but she was at a lost how these skills could be transferred into the work place. This confusion guided her decision to join a graduate scheme at a multinational IT consultancy with view to sample different aspects of IT. As a graduate it was difficult to actually get yourself selected for a project, there was an aggressive internal recruitment process and generally individuals were only as good as their last project. Finalia spent 4 years and slowly became visible but spent long periods (5 months) away from home living in hotels. There was a culture of constant chaos and adjustment, her line manager changed 4 times in one year! The work was varied but working on only one component of a large projects Finalia found the work lacked 'the big picture'. There was also long lulls between project where consultants waited to be assigned, during yet another lull Finalia found her current post.. The organisation could not be further from the consultancy in that it is a small start-up company, she took a drop in wages, left a pension and private health care benefits behind but is extremely pleased with her decision. A year into her new post Finalia is discussing her future at the company with her manager, she is very visible and she can see where she has made a contribution. Finalia thriving in this role, dealing with smaller projects and the overall product life cycle when her contribution is in evidence, she also appreciates being in one location and building working relationships. Yes she does miss the extra benefits but the experiences she has gathered far exceed the monetary value. Finalia still has one eye on her future, she is a single women living at home and saving for her first home, with floristry fulfilling the creative part of her personality. At the age of 27 Finalia only now believes understand what she is actually doing, and to some point where she want to go. After 4 years at the IT consultancy Finalia has little fear of the recruitment process or of change and she is looking forward.

Nadia is a reserved 29 year old single mother who has recently completed a master's degree in Technology and Innovation in Management and is attempting to set up her own business. A chequered start saw her on completely her first degree course because it was far too technical. A period working in a call centre helped make the decision to return to University on a Computer Science and Management course which she did relocating to the other end of the country with her partner. A month into the course Nadia became pregnant but after the initial shock she stayed to complete the course as she was supported by her family and the University. Combining student life with motherhood was extremely hard work, her choice of degree again was extremely technical and there was an assumption of some level of understanding of basic programming so the learning curve was steep. Once qualified Nadia continued onto a Marketing and Technology Masters course primarily as she had an effective work-life balance that she did not want to disturb. There is an apprehension to enter the IT labour market, Nadia is hesitant about the long hours culture and the expectations that maybe placed upon her, and how that will effect her especially now as she is a single parent family. She is now in a no-win situation as the administration jobs which she has been applying find her too highly qualified and are not recruiting her but she considers the IT market will place too many pressures upon her. Her situation has influenced the decision to start-up her own business of web marketing in this way she can combine parenthood and work. A growing client base has boosted Nadia's confidence as she approaches another learning curve working for herself.

Molly a forceful 40-45 year Web Developer started with a strong science related education and went straight from school to work at the Home Office forensic Science laboratories. Molly refused to apply to University with a promise to study part-time which gaining qualifications within the human biological area. Her first introduction into computing came via her father who was made redundant and bought a computer (ZX80) which Molly helped set-up then she was hooked and bought her own. Realising that computing was establishing a critical role in medical sciences she tried to persuade her manager to finance computer training for her as there was no support within her department but they refused. Molly 'semi consciously' made herself indispensable to work colleagues who experienced IT problems and after about three years she was spending 50% of her time supporting the IT infrastructure. This then developed into a full time IT Management position where she honed her database, and software programming skills. Molly' career was progressing but problems at home found her having to leave work and begin home learning, a two year sabbatical was arranged but Molly never returned to work. Relocation, a new marriage and a new child began a new start as Molly tried to return back to the IT sector after a 5 year break. Struggling to gain work Molly began supporting friends with her technical knowledge buying hardware, building databases and she began to participate actively in online communities and newsgroups. Her interest in web-development also began and she was encouraged to buy a book and open a text editor learning from scratch how to build web sites. At yet another interview for IT support work she realised that she did not want 'people shouting and swearing at her all day' and decided to become self employment leaving her husband at home to manage the family. Attending business enterprise courses she met other people starting their own business and realised that the women felt a lot more comfortable talking to another women about IT so that is what I did. Currently 70-80% of her business is with women and 90% of her business is word of mouth. But, Molly has a disregard of some of her web colleagues and deliberately distances herself from certain sections of 'female designers who have maybe learnt how to use one package' and she is extremely angry at 'a group that I call hard core blondes and they do come over all blonde at the slight of technology....oh I need a man I need a man'. Molly is also annoyed by 'very intelligent women' who shy away from technology and she argues that it is a mindset problem. Currently her reputation is growing as a web accessibility consultant which means her client base is also expanding and she is planning to employ one or two new members of staff. Also adding to her heavy workload is her role as a panel member of the Professional Guild of Accessible Web Designers which she is passionate about.

9. WINIT Interviews

As previously detailed in our methodology section, we used a combination of quantitative and qualitative methods to fulfil our research aims, and to explore the experiences of female ICT professionals in England. We wanted to gather more in-depth data about these women's experiences than an online questionnaire would allow for. To this end we interviewed nineteen women of varying ages and levels of seniority currently working in IT roles in IT and non-IT organisations across England. We now turn to the key themes and issues which arose from our analysis of the transcripts of these nineteen interviews. These themes are divided into three main areas, which we have named 'Moving In', 'Moving Up' and 'Moving Out'. This linear demarcation of issues, whilst perhaps artificial in terms of women's 'everyday' experiences of working in IT, has proved useful in organising our research, and presenting it to different audiences (see Moore et al 2005).

9.1 Moving In

9.1.1 Getting into ICT

Most of our respondents began their stories, as related to the WINIT team, with the manner in which they entered the field of ICT. The key point to make here is that the roads our respondents had travelled to enter IT as a career, a somewhat 'unconventional choice' given the gendering of IT as predominately 'masculine', (particularly at entry times for those of our respondents who were over 40 years of age), had many twists and turns. As Webster notes 'the backgrounds of women IT professionals and their entry routes into the work are more diverse and unpredictable than is generally supposed (Webster 2005a:4). From her research, Webster (2005a) also highlights that many older women currently working in IT did not encounter computers at school (certainly not at primary level at least), but were women who excelled at maths and science at school. This fits in with evidence from our interviews.

For the younger women in our sample (i.e. those under 40 years of age) the route into IT came largely from undertaking a degree, not necessarily but predominately in IT or computing. Gaynor for example had read Computer Science, and had undertaken a Masters in Medical Informatics. Her qualifications, and desire to work in a structured environment which she believed would afford her with better promotion prospects, led her to apply for the trainee management scheme at the London base of an international IT firm.

There were interesting exceptions to the A-Levels-Degree-Trainee entry route. Belinda for example left school at 17 years of age following family difficulties, and went to work for an IT re-seller company. When we interviewed her, at the age of 26, she owned her own re-selling business with her now husband, and had won a Duke of Edinburgh Young Entrepreneur of the Year Award. She did not have any formal qualifications apart from GCSEs, but had extensive re-selling experience having held a number of high-profile and financially lucrative roles during her relatively brief career. Belinda recounts how she secured her first job in IT and what her key motivations were, saying,

For me I just wanted a massive house and a flash car and stuff like that. So I went to a local recruitment consultant and they said there was an opening in an IT distributor. So I went up to the interview and in the car on the way there the group of lads I was with were going "A motherboard is etc", I just didn't have a clue. I had a tiny little mini skirt on, and I thought I'll blag it. And so off I went and the guy actually gave me the job (Belinda, aged 25-29, IT business to business entrepreneur).

Belinda's primary motivation was money and status, and for her, IT offered the chance to earn good money in a fast-paced business. From her interview data with Australian female ICT professionals Teague (2000) also found money to be a key motivator for women entering IT, alongside 'the demand for computing personnel...and the challenges of computing careers: constant change, role and gender challenges; and enjoyment of surmounting challenges' (Teague 2000:152).

Returning to Belinda's story, she did highlight that her work environment at the beginnings of her meteoric career was male-dominated and often hostile. Belinda says,

So I kind of worked my way up. I left the office on a number of occasions in floods of tears, because it was all lads and it sometimes got really nasty and competitive and a lot of the people that I was dealing with were men, in fact all of them" (Belinda, aged 25-29, IT business to business entrepreneur).

The opportunities and rewards that Belinda perceived working in IT offered outweighed (for her) the downside of working in such environments. However, for some women such hostile environments, particularly at the initial entry point into IT, put them off continuing to work in the field, with a high rate of attrition of women from the IT sector now well documented (DTI 2005a). We suggest that through further qualitative research, such as that planned for the Disappearing Women project²², the reasons why female ICT professionals leave at early points of their career will become more apparent.

²² Disappearing Women: North-West ICT is an ESF-funded, 9 month project, focusing on the experiences of women in the North-West ICT sector. We will concentrate on the experiences of those women who have left IT, many vowing never to return, at a variety of points in their career, i.e. entry point and early-stage, mid-career and late-career.

Some of the women we interviewed entered IT later on in their careers after they felt they had exhausted a number of other career paths. Illiza, an IT Director for a large charity based in London, first sought a career in television journalism and script writing. Following a number of frustrating failed attempts to secure a job in journalism, and several years of admin jobs to earn a living, she decided to undertake some home-based learning, and chose IT modules. Her decision to change careers ten years ago was predicated on her concerns about being able to earn a decent wage to support her three children as a single parent. What prompted her decision was watching a (male) friend fixing PC hardware. She recounts how,

He was building a friend's PC and it was so simple inside, because a lot of people conceptions of hardware is that... you know...but when you put a computer together it is so simple so I just thought I wouldn't mind doing that. I went on an evening course for about three months, where I learned the basics of networking, the basics of pc maintenance, and that was it" (Illiza, 30-35 years, IT Director).

Given the possibility of self-learning of IT skills (through online courses for example), it would seem that for some women gaining IT skills is an attractive option in that it can be fitted in around childcare responsibilities, as in Illiza's case.

For the older women in our sample IT was viewed as the very start of their careers as something different and interesting, precisely because it was a very new field of knowledge and application. Many of these older women were at the vanguard of IT in the late 1960s and early 1970s at a point where the chance to do formal qualifications had yet to arise. As Cass puts it, "I can't remember the name of the company, there were clutch cards, it must have been a long time ago, and I thought wow, this looks different, you know it looked really nice but literally no opportunities came up. You couldn't do a degree in IT, a computing degree anything like that" (Cass, 50-55 years, retired IT Manager).

For these older women it would seem that at the time IT offered a unique opportunity to pursue an interesting and different career to the 'normal' paths of employment then available to women, such as teaching. Cass continues, "So I went into teaching experience, which again girls could do, they could teach, and I absolutely hated it. I just wanted to get into IT somehow, and I found a course, a Higher National Diploma, that's what you used to do then, computing, mathematics. So I got onto that and I joined Rolls-Royce, wanting to go into the IT department, but it was all male". Again due to the association of subjects such as mathematics with 'masculinity', women in this older age group still experienced difficulties in entering the IT field. However, once there they often single-mindedly pursued their goals, perhaps related to the passion they felt about computers and IT.

In addition the 'technical' nature of much entry-level IT proved to be a barrier to women due to stereotypical associations of technical work with male subjectivities. As Cass says,

I think, looking back, it's that first opportunity for women, which is quite difficult, and I think, well if you think about how people start in IT, before you get to that managerial role, you tend to be technical, and erm, well you used to be able to...you know they tended to be quite technical, and I mean, women tended not to be very technical, you know, so I think it was very difficult to get on and I think also it was this very much elitist thing, you know (Cass, 50-55 years, retired IT Manager).

The women we interviewed indicated that they thought the "first opportunity" to enter IT was vital. Cass related to us the tale of a male colleague who saw her potential and helped her to move into the IT department (which was all male at the time) from her initial position as a filing clerk. Many of our interviewees spoke of institutions, companies and/ or colleagues (of both genders) that gave them that all-important first opportunity, which acted as a 'springboard' for their subsequent careers. As noted in the WWW-ICT project, 'informal' mentors seem to influence women's careers, generally speaking in a positive manner (WWW-ICT 2004:63). From our interview data, we found that entry points into IT, whilst varied, often depended on support from women's social, professional and personal milieu.

9.1.2 Educational Background

Educational environment has been identified as one of the key factors in the interest and confidence about computers that girls (and women) hold (Kiesler et al 2002). Concern about giving access to computers to girls, and supporting the development of their IT skills, and their confidence in IT is the impetus behind the now familiar concept of 'Computer Clubs for Girls'²³. From our interview data we found that a number of our interviewees had attended all-girls schools, and/or had parents and siblings (of both genders) that were interested in, and encouraging about, the sciences, computers and IT. These findings correspond to those of the WWW-ICT project which notes, 'In the UK a considerable part of women with careers in ICT come from all female secondary schools' (WWW-ICT 2004:52). This was the experience of Gaynor, whose father was also a computer scientist teacher. She says,

Well the best place to start with me is probably secondary school. I was fortunate, in that I went to a selective, independent girls school...and I went there from the age of 11, and when I was there it was, basically, anything you wanted to do you could do. There were no blockers or anything, and we were pretty much taught that all the way through (Gaynor, 25-30 years, IT Business Analyst).

Here Gaynor describes the 'ethos' of her (all girls) secondary school, where consistency in teaching IT throughout her teenage years, and an environment where IT was not constructed as primarily a 'masculine' subject, contributed to her continued passion for, and knowledge of, computing. Other women in our interview sample entered IT when changes to their workplaces meant technology became increasingly important to the undertaking of day-to-day work tasks. Molly, a website developer with her own business, describes how in her former career as a Medical Lab Technician, computing became increasingly important, and her love of computers moved from being a hobby to being an integral part of her work through her own determined efforts. She recounts how,

I was just doing it [computing] as a hobby, it just fascinated me but what I began to realise in work was that computers were beginning to take a very important role in medical labs. I'd finished my fellowship and the only option at that point for me to do was to go on and do it was some kind of managerial laboratory management course. I just had no interest in that whatsoever and I approached my sort of Head of dept and said would you fund me to go to college and do computing (Molly, Web Developer).

Molly's senior manager declined to send her on a computing course, so she set about making herself 'indispensable' in relation to the computing practices that were involved in her workplace. She goes on to describe how,

I thought well ok what I'll do sooner or later someone's going to have a problem with their computer and they don't know who to ask so I'm just going to make sure that I keep learning as much as I can so when that happens I can say 'I can do that' 'I can look at it' so over about 2 or 3 years only semi consciously I was actually...it was actually a whole campaign to make myself indispensable and it got to the point towards the end of the 3 years where I was spending more than 50% of my time handling IT problems around the building you know I was supposed to be in the labs doing something and there would be a phone call 'Molly can you come and sort such and such ,we've got a problem, erm, the floppy disk won't read or this won't do that' (Molly, 40-45 years, Web Developer). One common theme in the stories of women in our interview sample is that of determination to pursue an interest and love of computers and IT, often in the face of negative and dismissive attitudes from others (often older and more senior male colleagues, line managers, even teachers). Josie, an IT Manager for a London-based charity, was actually discouraged from pursuing a career in IT right from an early age. She says,

It was a pretty circuitous route, well, how I got here. I didn't join IT straight from school. I was interested in IT at school but at that time it was a very new industry and I was strongly steered away from it by all concerned, by my careers advisor, my father, everybody (Josie, 35-40 years, IT Manager).

²³ See <http://www.cc4g.net/> for more details on the UK computer clubs for girls scheme developed by e-skills UK and funded by the DFES.

Another theme of our findings on moving into IT from our interviews is that of being the only, or one of the only, women in IT classrooms and staff rooms. Teague (2000) notes how some women in her interview sample actively disliked being in a minority, particularly disliking not being able to share experiences with other women, and not having access to female mentors. Rhonda, a 40-45 year old woman, now working as an ICT professional for the NHS, describes how, having never worked full-time before, she applied for an IT course at her local university. She found herself amongst “a sea of young male kids in leather jackets”. She recounts how, I think the ratio of men to women was 1 female to 10 males. And most of the females were the ones doing the language option there was only one boy on the language option and I have to say the first year was extremely difficult. The first term was the toughest of my life because it was a whole change for me (Rhonda, 40-45 years, IT Manager). Some of our interviews indicated that they ignored, or even thrived upon, the fact that they were one of a few females in a male dominated environment. For others the male dominance of the environment proved difficult to cope with, leaving some women feeling like they have to ‘play down’ their gender identity by being an ‘it in IT’, rather than a woman in IT (Adam et al 2006).

9.1.3 Early-Stage Careers

A number of our interviewees were at relatively early stages in their IT careers, and as a result were being offered particular opportunities, and facing specific barriers, linked to age, their domestic situations, their current position within organisational hierarchies, and so on (Moore et al 2006). Gaynor, an IT Business Analyst and Document Management Specialist based at the London office of a large international IT company, enjoys her work, and talks positively about her career prospects. She asserts that being a woman in IT currently counts in her favour as she says, “I’m much more visible. I’m remembered a lot more”. This coincides with the findings of Jensen and Takruri-Rizk (2006) who note how women engineers talk about being visible in the workplace (engineering being another male-dominated profession). However, Jensen and Takruri-Rizk (2006) go on to state, drawing on Faulkner (2005), that ‘even though women are visible as women, they are invisible as engineers and that means women have to do more work than men in order to be taken seriously...’ (Jensen and 2006:81). At this early-stage of Gaynor’s career, perhaps yet to hit the senior level ‘glass ceiling’²⁴, nor for that matter teeter on the edge of the ‘glass cliff’²⁵ (Wilson-Kovacs et al 2006), Gaynor does not report experiences of gender discrimination. However, she does highlight the possibility that her work-life balance, currently tipped very much in favour of her work, may be thrown off kilter if and when she decides to start a family. She says, I have no time to clean my house, or wash my clothes, or do anything at all, and how I would even cope if I decided to have a family is beyond me. Now I’m in a position at the moment where I don’t, at the moment, I don’t want to have kids. I’ve no burning desire to have them at the moment, so working such a long day, and having my boyfriend working such a long day as well, it fits.

K: It fits at this point of your life?

G: Yes, it fits, but how somebody in my position who wanted to have kids or wanted to have more of a family life, or have more commitments outside of work, well, quite honestly I don’t know, because quite often I’m required to work in the office, you know I’ll start at quarter past eight and I’ll be in until half past six, seven o’clock. That’s what they expect of us (Gaynor, 25-30 years, IT Business Analyst). Here we see how whilst long hour cultures may be relatively acceptable, although not necessarily desirable, to young female IT professionals at the early stages of their careers, post-university perhaps, such cultures loom large when early-stagers consider their own futures (Moore et al 2006a). With little or no resolution of work and possible family commitments apparent to early-stagers, who are well aware of the demands of long working hours, demands felt even when family responsibilities are not yet an issue, it can become difficult for early-stagers to envisage a longer term future working in the industry. Female representation worsens at the higher echelons of IT organisations, as Gaynor highlights, It’s probably still biased towards men, but not as much as when you get higher up the organisation. I think maybe it’s because people have been around a few years to get up to those sort of levels and the women have been away, maybe it’s because a lot of people do go away and have kids. There’s no concept of childcare at work (Gaynor, 25-30 years, IT Business Analyst).

²⁴ The term ‘glass ceiling’ refers to the fact that upper management in corporations and other large organizations, including ICT organisations, consists predominately, if not exclusively, of a certain demographic (e.g. white heterosexual men) despite non-discrimination policies.

²⁵ The term ‘glass cliff’ describes a situation wherein women are promoted into a risky, difficult job in the top echelons of management, where the chances of failure are higher. See <http://psy.ex.ac.uk/seorg/glasscliff/index.html> for more information.

Those women in the early stages of their IT careers may or may not have caring responsibilities (clearly not all 'early-stagers' are young women with no children). For those who do not long hour cultures and inflexible working patterns in IT may yet to become an issue. However, as Gaynor demonstrates, women in this position may already be considering work-life balance conflicts, and subsequently have difficulty reconciling their hopes for the future, in terms of career aspirations and in terms of having a family. For those men with children, such conflicts whilst apparent are unlikely to be so pressing given the gendered burden of care and caring expectations (Simpson 1998).

9.1.4 Positive/Negative Experiences

In term of moving into IT the women in our interview sample followed a myriad of different paths, and experienced various degrees of encouragement and discouragement from others. This combination of positive and negative experienced warns us against any temptation to homogenise women's experiences, and instead alerts us to the complexity of entry points into IT, and the diversity of female 'early-stagers' in the IT industry. However, despite this heterogeneity, some patterns of experiential commonalities and connections emerged. Positive experiences of entry into IT generally came from the support of others (a parent, a sibling, a teacher, a senior staff member) and from the support of an organisational culture which encouraged girl's and women's interests without recourse to stereotypes (such as Gaynor's secondary school). Without such support an initial interest in, even passion for, the sciences, computing, and IT, becomes undermined. Negative experiences of moving into IT tended, amongst out interview sample, to take the form of stereotypical attitudes from senior staff members (i.e. that computing was not 'women's work') or a lack of confidence about pursuing IT, often in the context of being the only, or one of the only, woman in all-male classes, or teams.

9.2 Moving Up

9.2.1 Experiences of the Workplace

Rather than painting a wholly gloomy picture of our interviewees' experiences of their IT workplaces, we would like to highlight some of the many positive comments we heard. However, these were often framed in negative stories of generally discriminatory organisational practices, especially to working mothers, and the sometimes highly sexist attitudes of colleagues. This aside some women, often those older women we talked to, commented that they had been made to feel welcome when they were the only female in an all-male team. It can be too easy to make the women in IT 'problem' a problem with the attitudes and actions of particular men. Clearly some of our interviewees' male colleagues were keen to have women on their team and acted accordingly, welcoming them. When asked whether she felt she had experienced gender discrimination, Cass, a now retired Senior IT Manager, says, "No, not at all. No I've never had...nothing that people have. I did the darts thing, everything. I never felt excluded and that's right up until retirement now". Whilst positive, some interviewees highlighted that they were made to 'feel welcome' and were encouraged in what were or are predominately male environments if (and only if) they were prepared to follow a 'male' linear career path, that is to move up the ranks of an organisation without carer breaks. Petra, co-owner of a multi-million pound IT recruitment company, recounts,

There were frustrating times. I mean we are talking about the mid-seventies and I always had to make a very strong point because I wasn't originally planning to have a family and when I was pregnant with Edward²⁶ my male boss nearly collapsed. Only because I'd brainwashed him into believing I wouldn't get pregnant, that's what I had to do.

Even irrespective of that there were guys that were being promoted who, there was no logical reason why I wasn't being...that was the early seventies, 30 years ago, but I'm not saying that it doesn't happen since then, I've got no idea but that was difficult (Petra, 55-60 years, co-owner of IT-tester recruitment company).

Petra's story is supported by our work (see Moore et al 2006a) on women's career paths in IT, whereby nuanced (i.e. not uniform) levels and forms of support for female ICT professionals are needed in relation to a combination of their age, their career-stage and their life-stage (such as their caring and domestic responsibilities). Expecting women to not only 'act like a man' (Adam et al 2006) but to also have a 'male career pattern' disadvantages them and severely undermines gender equity as the work of numerous writers has demonstrated (see Dex 1997, Crompton and Sanderson 1990, Crompton and Harris 1998, Evetts 1996, Schwartz 1992). Focusing on some of the positive comments from our interviewees, the nature of IT as a career, and as a subject, was important here. Finalia (25-30 years, software developer) initially chose IT, despite her family being from a "strongly medical background", because as she says, At the time IT was perceived as a good thing to get into, to get a good job. That was literally why I did an IT degree. When I was reading the [university] course literature I didn't really understand what the subjects were...I did a sandwich course as well as I thought that would be good to get a good job" (Finalia, 25-30 years, software developer) Finalia did indeed gain a full-time job in a large multinational IT firm from her university sandwich year placement, although she had since moved to a smaller telecommunications start-up to improve her organisational 'visibility' (taking a pay-cut in the process) and career progression prospects. Again for Finalia, the combining of the technical with the social in her university work fed her desire to continue in IT, despite her initial struggles with her course. She says, In my final year I enjoyed what I did but I wasn't really interested in the technical aspects, the project I did was more kind of social context, I was looking at electronic patient records, more the psychological, social and cultural barriers to it, although it had a technical aspect to it"(Finalia, 25-30 years, software developer).

Indeed for many of our interviewees the combination of technical and social skills, and the recognition that technologies are used in particular social contexts (and the challenges this brings to developers, managers and users) meant that they found IT engaging, far beyond the stereotype of solitary and unsociable (male) 'geek' students tapping away at a keyboard (Schott and Selwyn 2000). Other interviewees spoke of their enjoyment of the 'problem solving' aspects of their work, and their preference for working in teams, although this brings its own pressures for women working in the industry. One of our interviewees Finalia highlights this point about team work, saying, I am quite conscious as a woman that I don't, even more so, don't want to look stupid as I don't want to be the dumb girl who doesn't know anything. I'm quite conscious of that (Finalia, 25-30 years, software developer). Being a woman on a male-dominated IT project team may mean women feel under pressure to manage their gender and work identities in a specific manner, in the knowledge that mistakes on their part could undermine their hard-won expert status, making them visible as the "dumb girl!" rather than raising their visibility as an IT professional. Such negative visibility is produced in the context of the inequitable and hierarchical gendering of skills and knowledge. Cockburn (1985) argues that masculinity and technical skills are mutually constitutive, with much of what is taken to be masculine defined in terms of technical skills. Conversely technical skills are defined as those skills which men have (and which women do not). Consequently women in the workplace often carry a subordinate status with them that has little or no relation to qualifications, training or ability required for the job at hand (Adam et al

²⁶ Child's name changed.

2006, Woodfield 2000). Despite some stories of positive encounters with male colleagues, welcoming environments, and rewarding IT careers, many of the women in our interview sample commented on highly unwelcoming, even hostile male colleagues, producing uncomfortable, unpleasant working environments. Again Teague (2000) notes, in relation to hostile working environments in IT organisations, that ‘the arrogance and competitiveness of men in the industry, and their unwillingness to accept women on their merits, were stated dislikes...women disliked the way some men perceive women to be inferior until the women have proven themselves’ (Teague 2000:155). Ibuken, one of the WINIT interviewees, describes how in her most recent post, I was actually met with hostility from, you know male members of the team until...well no actually it got to the point I said to our IT manager I mean look I am not prepared to take or tolerate this and he says “well do you think we can work together after all of this” and I say “well I am not leaving” (Illiza, 35-40 years, IT Director). Within these accounts of hostility, many of the women modestly alluded to their determination to remain in IT, and to challenge the gender stereotypes they encountered. This stubbornness and dignity in the face of patronising and derogatory comments was humbling for the WINIT team, who greatly admired many of the women we spoke to. Ibuken’s comment, “well I am not leaving” told a story of her determination, but other women found the constant undermining of their abilities, and sometimes their character, from discriminatory attitudes and actions, wearing. Another woman in our interview sample tearfully revealed her desire to leave IT having been bullied by a male colleague for several years. She expressed her wish to enter a field where she perceived she would be better treated, to undertake (non-IT) work that “feeds my soul, not just my brain” (Natalie T, 30-35 years, IT Support for public sector organisation).

Continuing with our focus on female ICT professionals’ experiences of their working environments, we found from interview data analysis that for some women, stereotypes about what females can and cannot, or should and should not do, meant that working relations became strained. As Lizzy recounts, Well anyway in the workshop they didn’t like me picking up a spanner because I was a girlie and they felt that they had to do it all for me and that caused resentment because they had to do their own work at well (Lizzy, 25-30 years, Co-owner of IT Consultancy, Chartered Engineer) .

Other interviewees recounted similar stories of their skills, knowledge and experience being undermined by gendered occupational cultures (Faulkner 2005), meaning those ‘more subtle and taken-for-granted factors which contribute to making an occupation like engineering more appealing, comfortable and supportive to (more) men than women (2005:15). Faulkner highlights how women may struggle more than men to gain membership as engineers, given that engineering is seen as a more ‘gender authentic’ career choice for men than for women (2005:15), a point mirrored by data from our interviews with women in IT. Rhonda, 40-45 years of age and a Systems Analyst, tells how, I also get the butt of jokes that I am a mother hen and things like that because people come to me with their problems so yes I don’t think, there is enough support, a good attitude at a high enough level to make it tolerable, because these people are giving that kind of attitude and not that support, so you live with it (Rhonda) Here we see how Rhonda’s (stereotyped) gender identity supersedes her professional identity in some workplace interactions and situations, related to the perception that a ‘mothering role’ is seen as more ‘gender authentic’ than her ‘ICT professional’ role.

9.2.2 The Experiences of Women with Children

Out of the 19 women we interviewed, 8 did not have children, although the majority of these women were less than 30 years of age. 7 had older children, many of whom had already left home. 2 women had children under 5, whilst the remaining 2 had children ranging from under 5 years of age to over 18 years of age.

One of our interviewees, Rosie, 35-40 years of age, and a Senior IT Manager for an international chemicals company, described a steady decline in her working relationships after becoming a first-time mother, despite previously being extremely happy in her IT career. Rosie had moved to working three, then four days a week following the birth of her first child. She felt that her caring responsibilities were taken as a lack of ‘dedication’ to her work, and she had subsequently been not only demoted to a less senior role, but personally undermined by her male line-manager. He individualised the ‘problem’ as a problem with Rosie’s skill base, despite her having previously demonstrated the relevance of her skills to the role. She says, Yeah this role I’ve got...I’m still holding on to the possibility of change in the future. To be fair to my new manager, he says we know you want a project management role, we know that, but the opportunities are not there for

you to come in and manage the whole caboodle. He's actually saying get a skill, you'll then at least be considered and there's some opportunities for you it could work out great but I'm hating it as well (Rosie, 35-40 years, IT Manager).

Rosie's working status has been reduced as a direct result of her becoming a mother, despite having worked for the same company for 16 years, and despite having demonstrated her willingness to work around her (male) colleagues' working schedules. Rosie's attempts at flexibility and adaptability in the face of increasing inflexibility on the part of her formerly supportive colleagues and line-manager demonstrate the difficulties faced by working mothers, highlighting how working time is profoundly gendered. As Sirianna and Negrey (2000) write, Household-labour time and market-labour time are organized in part through the social structure of unequal gender relations. Generally, women do more household work than men, women's market work is undervalued, and the greatest rewards for market work accrue to men. The career model of employment is biased in favour of men who have few household responsibilities (2000:59).

Here we would add that working mothers such as Rosie bear the brunt of the gendering of working time. The presence of children in a household clearly results in increases in total household labour time, leading to larger increases in the women's than the men's contributions to such labour (Sirianna and Negrey 2000). As Berk notes in relation to the US domestic labour patterns, wives and female partners do more, "almost as if they were the only source of household labour" (1985: 152). Given such difficulties it is perhaps unsurprising that women in the UK are increasingly having children later if at all²⁷. In her seminal 'managing like a man' book, Judy Wajcman writes, 'Most of the women up against the infamous glass ceiling have already found it necessary to forgo having children' (1998:105). Illiza, a 35-40 year old IT Director was pregnant with her fifth child when we interviewed her. She worked full-time and had been a single mum of three for some time before she had met her current husband, and had two more children. Illiza talks about how she feels she has to try and retain a semblance of balance between work and family, but finds it difficult, although she does not blame an externally imposed 'long hour culture' for this, as she feels that she chooses to work long hours for the sake of her career and her children's future. However she does say, I do put in a lot of time outside the office it is very hard balancing things but I would say that I haven't quite got the balance right between my family and my career because my career seems to take precedence at the moment (Illiza, 35-40 years, IT Director). Illiza did articulate her concern that by concentrating on her career "to put food on the table" she had "sacrificed my children". She says, With my career I want to be the best and what ever it takes to be the best and I have sacrificed my children and I mean I have had a divorce, a very messy divorce, in the past my children - I am friends with them - luckily they understand, but the only reason they understand is that over the years 12 years or so that I was a single parent yes I was always able to hold things together provide food on the table so they appreciate that (Illiza, 35-40 years, IT Director).

This excerpt highlights the stark but often financially necessary choices made by some women regarding which areas of their lives to prioritise at particular times (given that such priorities are apt to change and adapt to external circumstances and personal preferences). We see here the conflicts and very 'real' consequences generated by essentialist versions of 'woman', in which women who excel in one sphere of life (career, public) 'cannot' simultaneously excel, or supposedly even 'cope', in another (carer, private/domestic). This is often due to lack of sufficient structured support for working families, particularly single parent families, who have been 'demonised' (by the media and the UK government) rather than encouraged (Edwards et al 1999). Illiza counts herself lucky that extended family members are able to provide (free) good quality care for her children. The struggle to find good quality, flexible and affordable child care is an ongoing issue for working families with children in England and the rest of the UK. A recent study (Gatrell 2005) examining changes in family and working practices identified that highly qualified working women with children are suffering hidden discrimination from their employers despite current government work-life balance initiatives. There clearly exists some level of frustration with the lack of options available to working mothers, with 'flexibility' sometimes offering little more than added pressure as women continue to disproportionately undertake the 'burden' of care. In addition those women that work part-time, a rare option within the UK ICT industry, can suffer from diminished career progression prospects and a possible deterioration in the respect they receive from fellow full-time workers (DTI 2004). Finally we suggest that the long hour culture in the IT sector, dealt with in more detail below, makes IT a perhaps more problematic career choice for women with, or wishing to have, children than some other employment sectors.

²⁷ See 'Briton puts work and fun before babies', Guardian Unlimited, 2nd May 2006, for a broadsheet report on this issue (www.guardian.co.uk)

9.2.3 Long Hours Culture in the ICT Sector

We start this section with a quote from a 40 year old returner from the WINIT questionnaire, who manages in a paragraph to sum up many of the issues we would like to highlight regarding family commitments and caring responsibilities. She says,

It's the nature of the industry to be full on, committed and obsessive and to exhibit workaholic tendencies - drop everything at a moment's notice and go wherever you are needed for as long as it takes to fix whatever is wrong - great... who picks up the kids? makes tea? reads the bedtime story...(WINIT Questionnaire Respondent, Returner, 40 years old).

Here our questionnaire respondent describes an underlying tension within an industry that has the dubious honour of being renowned for its long hour and presenteeism cultures, with work that is often project and client led, and deadline driven. Flexibility in this context would seem to be more about the flexibility of workers to deliver on time, than related to the pursuit of a better work-life balance. The long hour culture in IT has been well documented (DTI 2005a, 2005b, Webster 2005:7-8) so we will not expand on the literature here. However, we do feel it important to highlight that for the women in our interview sample (and indeed in our questionnaire sample), long hours and presenteeism (Simpson 1998) continue to be major issues (see also Faulkner 2002). For some women, at particular points of their career, long hours were seen as a necessity of the role, a way improving their career prospects, and even as a source of choice and enjoyment (de Hoog 2005)²⁸. Cass, for example, recalls her time working in the London Stock Exchange with some fondness in her tone, saying,

But I wasn't married at that point so it was very easy, I worked literally 24 hours a day. Yes, literally I would go in night and day and that is expected in IT to a certain extent, you know there are expectations, not just if you're thinking of new programmes, new projects, then there are times when you do work night and day. I think then it is very hard if you're married. I found that after six months of that we moved here [to the Home Counties]. It was quite hard then" (Cass, 50-55 years, retired IT Manager). For Belinda, who owned her own PC re-selling and distribution company, long hours were integral to the success of her business, with her work being a great source of pleasure and satisfaction to her. She says,

I usually get here for 8:30....but then I would go on to whenever, usually we are entertaining or going out for clients most days of the week and then on a weekend like this weekend I have to all sort of P60's and things for all the staff. Just because we are so small, and we don't have a finance director kind of everything falls on me and I can't delegate. Because no body ever does it as well as I could do it so I end up, I love it as well and because ...is all fresh and new the website and that I've just sat and done that (Belinda).

However, as with our other interviewees aged under 30 (e.g. Gaynor), Belinda foresees a point where she may experience conflict as a working parent, saying of her work, "I love it but that's the hardest thing because I would love to have kids and then I think but I'd have to have a day off! And do I want all of that additional responsibility?". For Gaynor, long hours are all part of the ethos of corporate IT environments. She says, "If you're not prepared to work long hours, or be the one that stands out and use that to your advantage, then you don't want to do this job. It suits some people but not others" (Gaynor, 25-30 years, IT Business Analyst). We also found, as Webster (2005a) highlights, that part-time working was not offered as an option to any of our interviewees wishing to change their working patterns.

²⁸ Although the WINIT team would question the notion of choice and enjoyment as the primary factor in understanding why long hours are such an entrenched part of the IT workplace.

In this section (Moving Up) we have considered the issues highlighted by our interview data in relation to women's experiences of IT workplaces. Some of the key issues our interviewees talked about were their relationships with their male colleagues (with some being welcoming, and others being sexist and patronising), the advantages and disadvantages of being doubly 'visible' (as a woman) and 'invisible' (as an IT professional) in an IT organisation.

The women we spoke to were frustrated with being stereotyped, with Lizzy for example talking about the ways in which it was assumed she would be unable to, or should not, carry out certain tasks purely on the basis of her gender status. We also highlighted the difficulties faced by women with children working in the IT sector, which, despite recent calls for 'flexibility' and better work-life balance (DTI 2005b:16-18), is yet to sufficiently tackle the need for a greater range of working time options, such as part-time and term-time working.

On a more positive note WINIT interviewees spoke about the elements of IT work they enjoyed, and many spoke about the satisfaction they gained from careers they perceived as successful. Others however expressed their frustration with the way in which their career was progressing, and were considering leaving. We deal with such future-orientated data in the following section.

9.3 Moving Out

9.3.1 Plans for the Future

Towards the end of each interview we asked each participant to think about the future of IT as technology, of IT as an industry, and of their own personal work-life futures. The results from, and theoretical background to, this part of the interviews are presented in more detail elsewhere (see Moore et al 2006a). However, we thought it important to highlight here a few of the key issues women spoke about in relation to their personal futures, especially given the current problems of retaining women in the industry (DTI 2005b). The primary concern about personal futures expressed by a number of our interviewees was conflict between their careers and the carer responsibility they envisaged they may have in the future.

The five women we interviewed who were under 30 years of age did not have children (and here of course we must not assume they will eventually want to, or be able to). Four of these women mentioned the possible conflict they foresaw between the work role they held now, and any carer role they might hold in the future. Some expressed this in relation to the frustration that they felt with their current employment, seeing having a family as one possible way to regain the 'control' they felt they had lost through leading a demanding career in the IT industry. So Donna (25-30 years, Network Analyst), on describing the perceived incompetence of her (male) seniors, says, That's unfortunately where I am now in my career, I just think sod it. I'm so sick of fighting everything, I could just go away and have children, and at least I would be in control. I don't know if I'll stay in IT (Donna, 25-30 years, Network Analyst). Whilst in a sense Donna sees having children as a way of getting out of the IT sector, with which she has grown frustrated, other young women we spoke to saw envisaged a conflict between their desire to continue working in IT, and the possibility of having children in the future. To give example, the long hours that both Gaynor (25-30 years, Business Analyst) and Belinda (25-30 years, IT entrepreneur) were putting in to their current roles meant that they were highly pragmatic that the difficulties that having children would pose if they wished to continue climbing the IT career ladder. Both women acknowledged that continuing to work the long hours would not be compatible with a being a mother. This conflict is unlikely to be such a consideration for men in relation to personal career development, given the aforementioned gendered burden of care and normative caring expectations (Simpson 1998).

Gaynor, one of our interviewees under the age of 30, describes herself as ambitious. She has high expectations of herself, and works hard. This combination has enabled her progression from junior software developer to general management status over a six-year period. Gaynor's current role requires longer periods away from home. Extra responsibilities have brought added pressure to Gayle's life, and some uncertainty about the future, "I have no idea where it will go. I will either get used to it...some days I think why am I doing this?" Involvement in the company's 'ridiculously long-hours' culture of 12-hour days and attending evening team meetings leaves Gayle little time for life beyond work, "I barely have time to look after myself". Secure in a relationship, her partner is in a similar IS role but in the public sector. Gayle says, with regards to having a family in the future, that "I honestly can't see how I'd do it [the job] with children and spend any time with them". In the meantime Gayle is happy to spend some of her earnings on her passion; exotic scuba-diving holidays.

When Gaynor contemplates how children would impact upon her current lifestyle, she looks around for female role models, of which there is a scarcity and a need (Faulkner 2004:13). Gaynor says for example, "People in my position don't have kids, or they are older men with wives at home". The DTI's most recent report on women in the IT industry also addresses this issue, highlighting an 'anti-women culture' in many IT organisations which results in a 'loss of opportunities when women are of childbearing age' (DTI, 2005b:19). Here we see how gender, age, career-stage, family choices, work-life balance priorities, the male-domination of ICT workplaces, and wider factors such as the societal expectation for women to be the main care-givers in a family, all combine to shape the ways women at the early stages of their ICT careers experience their current and future-possible situations (see Moore et al 2006).

Other women in our interview sample, most notably the older women who were close to retirement, or had recently retired, were positive about the future in terms of continuing their interest in IT, and using the skills they had developed throughout their careers to pursue their own interests. Petra, a 55-60 year old women, with a multi-million pound IT recruitment business focusing on Software Testers, had already been considering her options for the future. Alongside considering taking up textiles, dress-making, and IT industry-focused journalism, she also talks about developing her stocks and shares portfolio with her female peers, I feel that when I finish with the company, whatever it might be, that success is installed in me and I would probably promote something else....Its amazing how you can find opportunities which haven't been thought of by other people. And if you go for it it's surprising what you can achieve. I mean the fact that we called or investment club the 'Stocking Tots' and we were an all-girls investment group, meant that we captured the imagination of journalists (Petra, 55-60 years, Co-owner or IT recruitment company).

For the older women in our sample, the future was something to look forward to in a positive manner, using the skills, and the confidence in their abilities to succeed, that they had gained over their years of working in the IT industry. Elsewhere, Platman and Taylor (2004) have written about the need to retain and encourage older workers (particularly women) in the IT industry, particularly as the recruitment pool from which the industry currently draws its workers (e.g. young, white males) will diminish in size in the future. Qualitative material from the WINIT interviews highlights the vast array of skills, and the high levels of confidence that older women, many of whom have worked in IT for a considerable number of years (Petra, quoted above, had over 30 years of experience in IT, and had seen many changes in both technology and working patterns over that time). Without nuanced strategies to retain such women, such talent could easily go to waste in the future (again see Moore et al 2006). We now turn to a brief consideration of the issue of retention of women in the IT industry, to finish this section on the WINIT interviews. Through undertaking the WINIT project, studying women 'returners', and particularly undertaking the WINIT interviews, we developed an interest in the particular experiences of women 'leavers', who we have termed the 'Disappearing Women'.

9.3.2 'Disappearing women'

The IBM/Women in IT Champions report (2003) highlights that more women leave the industry than are being recruited. 36% of new IT engagements in the UK (in the first quarter of 2002) were women, yet in same period, women accounted for 46% of all leavers. During the WINIT interviews, several women we spoke to mentioned women they knew, or had known, who were considering leaving, or had left, the IT industry, vowing never to return. The WINIT team have termed these leavers 'Disappearing Women'.

Whilst we did not have the time during the WINIT project, nor indeed the space in this final report, to fully consider the issues related to women who leave the industry, we requested, and received further funding from the European Social Fund (ESF) to undertake a short (nine month) project on why women leave the industry, and what, if anything, can be done about these 'leavers'. Hence, the ESF funded 'Disappearing Women Project: North-West ICT', commencing April 2006, will look at why women based in the region in England leave ICT, what push and pull factors contribute to high attrition rates amongst particular age groups, and what these women do after they leave the industry. Drawing on the qualitative skills we developed from undertaking the WINIT interviews, we will conduct a series of in-depth interviews with women who have left the industry, possibly in the form of life-history 'stories', so as to explore their reasons for leaving. The following issues are open for us to consider, strategically but somewhat artificially separated out into 'Push' and 'Pull' factors;

Possible Push Factors

- Hostile organisational cultures
- 'Aggressive masculinity' associated with technical skill that is out of line with reported skill and business needs of the ICT sector
- Bullying in the ICT workplace
- Pay discrimination and inequality
- Progression based on factors other than merit
- Inflexible working time practices unsuited to women

Possible Pull Factors

- Leaving representing a resolution of conflict given that family and domestic responsibilities incompatible with ICT workplace culture
- Women's perceptions regarding better progression in other sectors
- Personal fulfilment? "Feeding my brain but not my soul" (quote from Natalie T, WINIT project interviewee)
- Age, career-stage and life-stage? (See Moore et al 2006)
- Women moving on to 'pastures new'? Regional displacement, own business, family, travel

Clearly analysis of these possible push and pull factors in terms of why women leave the IT sector is in its very early stages, but should progress as the 'Disappearing Women' project continues. More information on the project and emergent results may be found over the coming year (2006) at www.winit-salford.com/disappearingwomen.

This section has summarised some of findings from the WINIT interviews. We have looked at the issues raised by the women we spoke to in relation to moving into IT (such as experiences of education and early career challenges), moving up in IT (such as relationships with male colleagues, likes and dislikes with regards to IT work, and the experiences of working mothers), and moving out of IT (such as interviewees' future plans, and why women might leave the industry). All the issues explored in the WINIT interview sections were also related to data from the WINIT questionnaire. We now turn to the overall conclusions of this report, which draws on our findings from both the questionnaire and the interviews. However, the conclusions section is not lengthy given that we have dealt with the issues at hand in more detail in five academic book chapters and journal articles, which are available in CD-Rom format²⁹.

²⁹ Please contact k.moore@salford.ac.uk, or m.griffiths@salford.ac.uk for a copy of this CD-Rom.

10. Overall Conclusions

In this document we mapped out the WINIT research aims, and documented the ways in which we attempted to reach these aims through various research exercises (such as the WINIT online questionnaire) and outputs (such as the WINIT international and interdisciplinary conference). We then explored the ways in which various important concepts for the WINIT project have been understood by other researchers and academics. These key concepts included understandings of 'gender', of 'technology', of 'women in/and ICT', and of 'work'. We also briefly documented some of the resources we found useful in undertaking the WINIT project.

Moving onto the activities undertaken by the WINIT research team, we spoke about the theoretical stance which WINIT took towards women in IT, and looked at the impact this stance had on the methodologies and methods the WINIT team used to produce meaningful data on the 'problem' of women in IT. The section on methods specifically details how we undertook the WINIT online questionnaire, and how we conducted the WINIT interviews.

In terms of findings, it is difficult to summarise such a vast array of disparate findings in different forms (i.e. quantitative data, and qualitative data), from two very different sources (i.e. the questionnaire and the interviews). However, below we have organised key findings into bullet points, which we feel will be an accessible way of presenting the data the project has produced. As previously mentioned, for those readers preferring to explore the WINIT findings in more depth, the five academic book chapters and journal articles produced by the WINIT team are available in CD-Rom format on request. Hence the following summary of findings is relatively 'descriptive' i.e. simply describing key findings, whilst the WINIT academic papers are more theoretical and 'prescriptive', that is they relate more closely to current academic debates and literature, and offer possible 'solutions' to the 'problem' of women in IT. From our analysis of a combination of the WINIT questionnaire and the WINIT interviews we would like to highlight the following key findings:

Heterogeneity: The women who participated in the WINIT questionnaire, and who were interviewed as part of the WINIT project, were heterogeneous in terms of age (although our survey sample were relatively young), ethnicity, educational background (although we found participants were generally very well educated, and 16 out of the 19 interviewees had been to an all-girls schools), pay and rewards, and organisational seniority. In addition, the women who participated in the WINIT research were in a wide range of IT positions, although the highest proportion in the survey (indicating they were IT workers in IT organisations) were Software (Project) Developers (30%).

Commonalities: Despite the aforementioned heterogeneity of the women who participated in WINIT research, there were a number of commonalities we found striking. These included regional location (with the majority of respondents to the questionnaire living and working in London and the South-East, which is understandable given the dominance of this region in terms of IT companies, and IT positions), and caring responsibilities (with a slight majority of questionnaire respondents not having children).

Line managers: Given the statistical dominance of men in IT, it is perhaps unsurprising that for most participants, their line-managers were male. Here issues of mentoring, or role-models, and of being able to raise 'female issues' (however defined) in the workplace come to the fore.

Working patterns: Women in IT continue for the most part to work full-time hours. The lack of other working time options which may be better suited to women, particularly those with caring responsibilities, remains a problem. Other working pattern problems include expectations of presenteeism in the sector, and expectations of long working hours (particularly in those positions which are project-led, and/or client-facing). For those women currently without caring responsibilities this was not necessarily viewed as a problem, although even amongst this group it was recognised that having children was likely to prove incompatible with the IT industry's working-time ethos.

Job churn: It would appear that an inordinate amount of women are currently looking for a new job (in IT or elsewhere), or have just moved from one job to another, hence considering changing or already having changed their future career directions. From the WINIT findings it seems likely that dissatisfaction with aspects of their current positions (from long commutes, to bullying in the workplace) is one of the key reasons women change, or are looking to change positions. It is possible that this high job churn could be minimised if women were treated more equitably in the IT workplace.

Levels of satisfaction: Generally speaking it would appear that the majority of women are relatively satisfied with their work in IT, as indicated by a number of different measures used within the WINIT research. However, there was a sizeable minority who voiced their dissatisfaction, particularly in relation to the pay and more general recognition they received based on their particular skill levels, and their workload levels. The lowest levels of satisfaction were reported in relation to pay and level of qualification, with the majority of women highlighting that they did not feel sufficiently rewarded in relation to the formal qualifications they had (such as higher degrees).

Being valued at work, valuing their work: Despite the aforementioned levels of dissatisfaction in relation to pay and rewards, most women felt valued at work, one of the more positive findings of the WINIT research project. Indeed many women spoke to us about the 'buzz' they got from interacting with colleagues and clients, from the 'problem-solving' aspects of their work (meeting client's needs through joint project work for example), and from feeling as if they were contributing something to wider society (in terms of the advancement of technology for example). Indeed the majority of questionnaire respondents indicated that they would happily recommend a career in IT to young women.

'Old Boys' Networks: WINIT research found continuing evidence of after hours drinks cultures, exclusivity in work-leisure activities (rounds of golf between male line-managers), and decisions being made outside of office hours (when female workers, especially those with children, may not be present). Hence it would appear that 'old boys networks' continue to play a role in excluding women in IT, and undermining their progression through arcane promotion processes (of "who you know, not what you know").

The Future: Women in IT remain relatively positive about their own personal futures, with the majority envisaging their career continuing in the IT industry. However they are less optimistic about the image of the IT changing to be more attractive to young women, although this did not put them off encouraging young women to pursue a career in IT. We envisaged having some form of 'answers' at the end of a two year research project into women in IT in England. The lack of clear 'solutions' to the statistical and symbolic under-representation of women in IT is however unsurprising given the complexity of the issues at hand; the historical and social linking of 'male' with the 'technical', whilst challenged by feminist writers, and women working in IT alike, remains deeply entrenched in Western culture at least. Gendered working patterns, such as the dominance of full-time work, and relatively linear career path expectations (in this supposedly 'portfolio career' age) which penalises women for the career breaks they take to raise children continue to remain a challenge for those women who overcome gender stereotypes, and pursue a career in the IT industry.

The sexism and even misogyny faced by some women working in IT continues. The pay gap, long hours culture, and the continuation of 'old boys networks' in the sector remains unacceptable, whilst issues such as a lack of affordable childcare continue to hamper working mother's IT careers. Yet the women we spoke to resourcefully tackle these challenges with a combination of dignity and quiet anger that their high levels of skill and expertise are still not being fully recognised. We hope that the WINIT project has gone some way to contributing to the debate that must continue about how to tackle the 'problem' of women in IT, without situating the 'problem' in these courageous women themselves.

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