Preface

The fifteen chapters that make up this book all deal to different degrees with four features of the burgeoning knowledge society: Gender, Equity, Learning, and Information Technology. The main interest, which all the chapters take as a theme, is that of Gender – not in the taken-for-granted biological sense of sex but in the socially constituted sense of the major category of human being in the world. Equity is a broader term than gender, but here it is restricted to the ethical equity that can be neglected or overlooked in relation to gender and societal development where male role models and male power players have predominated. Learning is the number one prerequisite for the emergence of an equitable knowledge society, learning to use and shape the new tools that support the society and ensure that its development includes greater social justice rather than mere change alone. And finally, Information Technology, IT (or ICT, Information and Communication Technology as it is almost synonymously called) is the overridingly important innovation in our knowledge society, both driving it and being driven by it, being taken for granted in homes and workplaces at the same time as new implementations and applications are being introduced daily.

The book is situated in the social studies of information technology: how IT skills are learned and how these skills are gendered. It draws on the disciplines of sociology, education, cultural and media studies, and gender studies. The authors use a variety of research methods and theoretical perspectives. The case studies in the book approach gender and IT in different contexts: education settings, work settings and everyday life. The book comes from a European perspective but with a global dimension. Certainly there is a growing awareness in the research field that it is no longer adequate to have only American and European studies. The field of IT is global, and international practices need to be included in the field of knowledge. The social and symbolic operation of gender is different in different cultures and consequently has a different impact on women’s relationship with IT. A unique feature of this book is that gender relations and IT are examined in a multidimensional way.

Gender, Equity, Learning and Information Technology can be seen as intersecting to form a theoretical and abstract field of knowledge emanating from very concrete lived experiences. That field is being researched from a number of different points of view, with different starting points and different theoretical assumptions, addressing issues from different areas of the field. The reader will find significant differences in the issues being tackled, the methods being applied, the theories being espoused and the contexts in which the research takes place, but taken together they will offer a rich insight into both the issues themselves and the field of research which they represent.

The chapters have their origins in the work of members of two research networks – GLIT (Gender, Learning and IT) from Sweden and ATHENA (The Advanced Thematic Network of Women’s Studies in Europe) which is a European network – both of which we wish to introduce now. While the GLIT network has contributed chapters that are mostly Swedish in context, or at least in authorship, the Athena network has contributed papers from around the world, thus adding an important international dimension to the book.
In 2000 a research programme on Learning and IT (LearnIT\(^1\)) was initiated in Sweden under the auspices of the Knowledge Foundation of Sweden (KK-stiftelsen\(^2\)) and one of the editors (Booth) took up a research fellowship there. It turned out that the Foundation had virtually no principles on gender or equity in their research and development funding, or even in their own organisation, and an investigation was initiated by LearnIT into the ways in which their enormous investments in bringing IT into schools – one of their main remits – had treated gender and equity issues. The result was startling (Booth & Booth, 2000)\(^3\) – of 660 projects they had financed, a search on gender-related terms in both Swedish and English gave only 91 hits; of those only 45 took up issues that could be related to gender and equity in the IT-society specifically, and less than half of these focused directly on gender or equity or both. Funding was quite soon granted by KK-Stiftelsen, through LearnIT, to form a network of Swedish researchers who could contribute to the debate that was obviously needed. The network, led and administered by Booth and Goodman, in time obtained funds from the same sources to finance six peer-refereed research projects, five of which are reported here, and to continue with symposia and conferences which have also contributed chapters to the book.

The ATHENA network is an EU funded programme which brings together 80 funded institutes who do work in gender and women’s studies. It has operated since 1999, and has produced a wealth of publications, research projects and curriculum developments. One aspect of Athena has been to explore best practices for using digital technologies and e-learning for gender studies programmes. Goodman and Kirkup had worked together in this network previously, producing a volume of papers on IT use in Women’s Studies (Goodman et al., 2003)\(^4\). The three editors decided that there was enough interesting material coming from both networks to produce a published collection that would make a significant contribution to the field.

In this introduction we will introduce the chapters of this book so that you, the reader, can find more easily those that interest you as well as giving you an overview of the whole. We will present the chapters in five themes, Being and becoming IT professionals, Working with and preparing to work with IT, Representation in media, Adult education, and Digital learning. Finally we will look briefly at the methodological and theoretical underpinnings of the different contributions.

The first theme, Being and becoming IT professionals, begins with an in-depth qualitative study on *Women, men and programming – knowledge, metaphors and masculinity* by Inger Boivie. In her research with computer programmers and future programmers, Boivie, herself a computer and programming professional in Sweden, formerly of Uppsala University, explores the world of computing as a discipline in universities, and examines the issue of whether and how computer science has practices which contribute to a strict separation between “experts” and “users” which further exacerbates the exclusion of women from “real” computing. To illuminate this question Boivie focuses on aspects of the gendering of computer science and IT, related to epistemological issues of what constitutes computing as both knowledge and practice and what type of knowledge is valued in the profession.

In the paper on *New gender relations in the transforming IT-industry of Malaysia* Ulf Mellström from Luleå University of Technology in Sweden also takes as his subject the gendering of computer sciences in a professional and educational context in Malaysia. He investigates how and why computer science courses in Malaysia are dominated by women, in contrast to the situation in most other countries discussed in this book. In his work he strives for “more culturally situated analyses of the gendering of technology or the technology of gendering with the Malaysian case exemplifying the core of the argument.” He grounds his research in social anthropology, feminist studies of technology and a critique of both the ‘black-boxing’ of gender in gender and technology studies and the Anglo-centric bias of gender and technology studies. Mellström argues for the importance of intersectional analysis so that one understands the cultural specificity of the context.
The third chapter in this theme also extends it geographically, turning attention to computer science education in Afghanistan, where a larger number of young women are studying undergraduate computer science courses than the rest of the world might expect. Eva Maria Hoffman from the Technische Universität in Berlin, Germany, writes of *Women in computer science in Afghanistan*. She has surveyed Afghan women students and discusses the opportunities that they feel a computer science education will give them in helping rebuild their society, as well as the challenges faced by them in studying in a country where there are both cultural and economic challenges for women students. She discussed the importance of setting up networks for these young women, computer science professionals and students to provide both a physical and virtual a space where they can get to know one another and exchange ideas and information.

The second theme in this collection concerns Working with and preparing to work with IT, and it opens with an ethnographic study of the design process in an IT business analysis development from Johanna Sefyrin, from Mid-Sweden University. Her title starts with a quote from an interview and finishes with the key theoretical ideas underpinning work: “For me it doesn’t matter where I put my information” – *Enactments of agency, mutual learning, and gender in IT design*. This chapter offers a detailed analysis of a moment in a particular design process where the material and social relations are inextricably intertwined with the issues of agency, mutual learning and gender. The theoretical approach she uses is from Karin Barad – a theory which is variously described as “agential realism” or a new “feminist materialism” and draws on metaphors from the world of theoretical physics in which humans and technology are viewed as mutually engaged in producing the material world.

The second chapter in this second theme also uses Barad’s theoretical framework, now applied to understanding the reality of working in new IT-intense administrative work, where women are the main groups of employees submitted to ever-sharpening claims for efficiency and effectiveness in the rationalization process of local authority administration. In *Attaching people and technology: between e and government*, Christine Mörtberg from Oslo University and Umeå University and Pirjo Elovaara from Blekinge Institute of Technology paint a picture of the IT-intensive life two groups of women are leading at work in Swedish local authority administration, gathered through interactive workshops with the women and analyzed to give voice to their everyday lives.

The third and last chapter in this section looks at the issues associated with recruiting women into ICT-related careers. Marie Griffiths and Helen Richardson, both from the University of Salford in the UK call their chapter *Against all odds, from all-girls schools to all-boys work-places: Women’s unsuspecting trajectory into the UK ICT sector*. On the basis of a survey of women in the ICT sector with respect to their paths into their work, they find that, even after many years of special initiatives in UK schools and a significant reduction in the numbers of single sex girls schools most women computer professionals in their sample came from single-sex schools where they studied mathematics and science. This suggests that in the UK at least aspects of gendered school education as still being played out in the careers of women.

Having looked into the reality of the gendered nature of working and preparing to work in various sectors of ICT, the third theme *Representation in the Media* looks into what is considered to be an important factor in producing a gendered world: how the sexes are represented in ever-day media. The first chapter in this section looks at the different ways in which potential computer students experience being told about studying computer engineering by a range of virtual characters in a computer environment designed to attract new students to the field. Agneta Gulz and Magnus Haake from Lund University in Sweden designed and implemented four virtual characters with different degrees of femininity, masculinity and androgyny and exposed final year high school students to them in recruitment software. In the broadest terms, they found that school students showed preference for the more androgynous female and
male presenters, in comparison with the more stereotypical feminine and masculine virtual characters. The implications for this in designing online information systems is discussed in the chapter.

Absent women: Research on gender relations in IT education mediated by Swedish newspapers is the next chapter where Martha Blomquist from Uppsala University in Sweden presents a gender-sensitive analysis of the discourse with which IT and gender issues – predominantly the lack of women in the field – were discussed in Swedish newspapers in the years 1994 to 2004. She carries out a textual analysis of the content of these newspapers and identifies that there is both a masculine discourse – in which an assumption is made of technology as a male preserve – and a feminised discourse – that women have qualities that are needed in the IT field – but she found little evidence of a more nuanced differentiated discourse which could lead the debate on more fruitful paths.

The third paper in this section on media points again to the masculine nature of the IT related discourse, this time in the popular media, in the form of Dutch soaps that are very popular with teenagers. Els Rommes from Radboud University, Netherlands, in Heteronormativity revisited: Adolescents’ educational choices, sexuality and soaps, explores the notions that heteronormativity, the normalised expectation that men and women are attracted to each other because of their presumed gender difference and gender complementarity, can offer an explanation for the persisting association between masculinity and technological and computer competence. In particular, she explores two aspects of heteronormative gender relations, namely sexual attractiveness and the heteronormative division of labour. In the examples of popular media that she studies, not only do men and women have stereotypical gender roles with respect to technologies, but they also play these as complementary to each other and as constructing gendered relationships.

The fourth theme and section in the book is on the theme of Adult education, both using IT as a medium of communication and having IT as the subject of education. Shirley Booth from the University of the Witwatersrand in South Africa and Eva Wigforss from Lund University in Sweden have studied two women who take part in a university-based distance course to induct them into the academic practices of the university, in preparation for a possible entry to higher education. In Approaching higher education: A life-world story of home-places, work-places and learn-places, they show that there are differences in the ways the women experience the relationship to higher education which can be ascribed to the relations to people and practices they encounter in their everyday experienced places of home and work, and that is seen to impact on the ways they enter higher education.

Following that, Annika Bergviken-Rensfeldt and Sandra Riomar from the University of Gothenburg address Swedish policy on distance education using a gender and space analysis to ask how spaces of distance education are gendered and what power asymmetries are produced. In Gendered distance education spaces: “Keeping women in place?” they question the assumed open, flexible and liberating nature of distance education by considering the spaces that are created in terms of their off-campus nature, the gendered use of technology and location of the home as the place for learning. These, they conclude, create spaces that risk keeping women in their place, by disempowering them in comparison with the norms of higher education which take people out of their domestic environment.

This fourth section closes with a chapter that looks at adult education for competence in using computers and information technology. Minna Salminen-Karlsson from Upsala University in Sweden carried out a survey of computing courses in adult education centres in Sweden. She discusses the results of this in her chapter Computer courses in adult education in a gender perspective and raises practical questions about gender differences in computer competence and women’s feelings of technical inadequacy. She asks how educators can take advantage of women’s interest in computers while aligning this with their expectations about their future life chances. She found, on the basis of a survey of a broad spectrum of adult learning centres, that while men reported greater computer competence, even in a younger age
group, there was no gender difference in regard to interest or attitudes towards computing. Despite this, women were more critical and more dissatisfied with their courses than men.

The final section comprises three chapters on the theme of Digital learning. The first chapter in the section asks about the gendering of two of the most commonly used features of what has come to be called Web 2.0: the range of online applications that encourage social networking, and group content creation. Gill Kirkup of the Open University in the UK— who has been involved with the Athena network since its inception and with the GLIT network since being one of the first invited speakers at its symposia and invited keynote speaker at the final conference— considers the role of blogs and wikis in creating gendered knowledge in *Gendered knowledge production in universities in a Web 2.0 world*. She begins by discussing the historical achievements that women have made in first gaining entry to learning at universities and more recently becoming scholars who are fully engaged as knowledge producers in universities alongside men. However, drawing on feminist theories of the gendering of knowledge production, she asks whether some of the new forms of Web 2.0 knowledge production are more gendered than traditional print technologies. She argues that blogs appear to be more aligned to what have been described as a women’s way of writing, while wikis could allow invisible power hierarchies to create gendered knowledge. She argues for critical engagement with Web 2.0 technologies by women scholars and students in particular.

In the second chapter in this theme, Gwyneth Hughes, of London Institute of Education, in the UK, looks at the uses of metaphors of bees in the hive, to explore gendered ‘performance’ in collaborative online groups. She took as a case study the students she taught and analyzed their behavior in online forums. She describes different behaviors she observed as: frustrated queens, workers, and excluded drones and argued that these different kinds of gender behaviors did not lead to harmonious and productive collaboration. She concludes that a shift from face-to-face to online does not necessarily promote shifts in gender performances and that students and teachers need to find new ways of performing gender online if they are to maximize the potential of collaborative work.

And finally, as befits such an internationally grounded book with gender, learning, and IT in focus, there is a chapter from a group of European feminist researchers and teachers of gender studies who call for, justify, and describe a move *Towards a Feminist manifesto for e-learning* against a background of the current developments in the field which are strongly driven by economic and technical concerns. The manifesto critically analyses current developments from gendered theoretical perspectives and calls for consideration of the feminist work on embodiment, knowledge, power, and ethics to be built into e-learning policies as well as practical applications in the classroom and use by teachers. They offer this paper as the first step towards a more detailed radical manifesto, which would take up some of those issues discussed by other authors in their chapters: intersectionality, culture, and context being some of the key ones.

The fifteen chapters of the book come from a number of different, largely social science, research perspectives and exemplify a number of different methodological approaches to the field. These differ in the extent to which they embody gender and feminist theory even though all take up issues that put gender in focus. Three of the chapters use a distinctive theoretical perspective that originates in the work of Karen Barad, a theoretical physicist turned feminist researcher, and uses the inter-actions of physics phenomena as metaphors for the inter-actions of people and the material features of their environments in the creation of a material world that we understand. This material is likely to be the least familiar to most readers, but it demonstrates some of the new directions in feminist theories of creation of gender in bodies and social systems. There are references in several chapters to more familiar feminist theory in particular the pioneering work published, first by Carol Gilligan and then by Belenky and colleagues, on what they call women’s ways of knowing. This literature remains controversial in the fields of psychol-
ogy and education in which it first emerged, but it underpins a great deal of work which still continues trying to understand the nature of gendered differences in how people relate to the world and each other. Further, two significant theoretical underpinnings in a number of the articles are, first, the concept of intersectionality which emphasizes the complex intersections of social categories including gender, ethnicity, class, sexuality, religion and disability, and, second, the feminist pedagogical theories which have taken inspiration from critical and Freirian pedagogy. Then there are the approaches to research that do not emanate from gender research or feminism, such as the quantitative work of surveys and the phenomenological analysis of the every-day life-world, which can also turn attention to gendering and learning. These draw on a variety of theoretical frameworks to explain their findings.

Depending on the ideological perspective, learning is dealt with in different ways, too, sometimes more and other times less explicitly. A broadly socio-constructivist thinking underpins much of the work reported in the book, learning being characterized as socially constructed when people work together with their knowledge and their tools. The ideas of learning being associated with acquiring and adopting new practices of work and thought are to be seen in several chapters. Learning as coming to see new aspects of the world and the salient phenomena in the every-day life-world underpins the phenomenological and phenomenographic work reported.

In lots of ways the chapters in this book give a flavour of the kind of research that is now being carried out in the interdisciplinary field of gender, education and work, in particular where that education or work entails the use of technologies or has technologies as its content. There is still a great deal of work to be done. We have seen dramatic changes across the world in the last century with respect to the participation of women and girls in work and education, but where that intersects with technologies, it remains gendered in ways that other areas of education and work no longer appear to be. There continues to be a need for further research and intervention.

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ENDNOTES

1 www.learnit.org.gu.se/english/
2 KK-stiftelsen, Kunskap och Kompetens, www.kks.se