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Harnessing Diversity: Individual Differences in the Use of Farm Management Software

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ABSTRACT

This paper reports on an interpretive study which explores the influences of socio-cultural factors in the interplay between farm women and technology for farm management purposes on Australian family cotton farms. The study revealed growing support for the theory of individual differences of gender and IT in situations where women and men farm partners perform certain tasks for which they are neither biologically predetermined nor socially constituted. By harnessing the diverse skills of farm partners, decision making on the family farm is enhanced. This paper contributes to both theory and practice by extending the conceptual foundations for recognising and valuing gendered relationships and diversity in a global context.

Keywords

Gender, essentialism, social shaping, individual differences, farm management software, cotton, Australia.

INTRODUCTION

Innovative technologies, such as the agricultural decision support system (DSS) *CottonLOGIC*, are considered keys to the adoption of sustainable farming systems by Australian cotton growers (Hearn and Bange, 2002). Research indicates that farm women are the dominant users of farm office computers, in particular for financial and off-the-shelf applications, and, as joint partners in the family farm, many women cotton growers are increasingly motivated to learn about farm management (Stewart, 2004). Nevertheless, with changing work responsibilities and identities in the agrifamily (Martz, 2006), the decision-making roles of farm women in rural Australian society remain unclear (Stewart, 2004).

In a scholarly article evaluating the concept of gender, Adam, Howcroft and Richardson (2004) claimed that the topic of gender and technology is understudied and undertheorised in the IS literature. This paper applies Trauth's (2002, 2006) emergent individual differences of gender and IT theory by responding to the call from Trauth, Quesenberry and Huang (2008, p.7) for "additional research that articulates how cultural factors influence the image of gender, the image of technology, and gender relations with respect to technology". This paper revisits the data from an interpretive case study in the Australian cotton industry which informed a doctoral thesis by the first author (Mackrell, 2006). The authors began the analysis of the data through essentialist and social constructivist arguments but found that these perspectives did not completely explain family farm dynamics. The authors then applied the socio-cultural factors of individual differences theory of gender and IT (Trauth, 2006; Trauth, Quesenberry and Huang, 2008).

The agricultural DSS of the study was *CottonLOGIC*, farm management software designed to support the management of cotton production. The software was developed in Australia in the late 1990s by the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO) and the Australian Cotton Cooperative Research Centre (CRC), with support from the Australian Cotton Research and Development Corporation (CRDC). *CottonLOGIC* consists of record-keeping and decision support modules to assist cotton growers and their advisors in the management of cotton pests, soil nutrition, and farm operations (Hearn and Bange, 2002). The first author observed during the data collection phase of the study that there were discernible differences in how and why women and men farm partners used *CottonLOGIC*. In a recent gender and IT article, Wilson (2004, p.81) remarked "gender relations involve difference, inequality and power". It is the 'difference' aspect which is the focus of this paper.

The structure of this paper is as follows. The literature review provides an overview of the scholarly literature and industry reports relating to gender, technology, and farming. The next section considers the dominant gender theories while the research design and methodology section describes data gathering methods and the conduct of the study. This is followed by the analysis section where interview data is interpreted in light of concepts from the theoretical framework. In the conclusion, the study is reviewed in relation to previous research.

LITERATURE REVIEW

The portrayal of women in farming has been the subject of many studies both in Australia and overseas. In research into the lives of Australian farm women, Alston (1995, 1998a, 1998b, 2000, 2003) argued that farm roles have developed based on gender stereotypes and that traditional gender divisions of labour prevail. Male farmers are participants in the 'more important' public sphere of outdoor work while farm women have become associated with the less visible private sphere of housework and children. In New Zealand, Allan's (2005) study exploring the lives and identities of farm women found that many farm women had become 'farm wives' through an implicit acceptance of conservative social norms. Conversely, Martz (2006) argued that gender relations, identities and roles of Canadian farm women have been transformed in response to structural changes on family farms.

Bryant (1999), in a report for an Australian government project, found that the use of software reflected the traditional gender divisions of labour on farming properties: that farm women are associated with financial data entry and record-keeping, while male farmers analyse and plan the farm business. However, Bryant (1999) also contended that many rural women were increasingly aware of the decision making and farm management possibilities of computer programs but depended on the male farmer, with his more detailed day-to-day outdoor farm knowledge, for the input data. The male farmer's reluctance to provide this data often frustrated the farm woman's attempt to use computers for farm decision making and management tasks. For a workable outcome, the report by Bryant (1999) recommended that farm men and women work collaboratively to enter data, analyse, and interpret it. One contribution to practice of this paper is in responding to Board's (1997) argument that better decisions in the rural sector would result from increased diversity in human resources by harnessing the expertise and many skills of rural women. It follows that farm women in using farm management software such as *CottonLOGIC* would be empowered to challenge existing farming practices.

Stewart (2004) explored the use of interactive communication technologies (ICTs) on family cotton farms in the Darling Downs region of Queensland, an Eastern state of Australia. Stewart (2004) found that ideologies of family farming, like technology, are socially shaped. That is, both farm roles and technology are gendered according to whether they are predominantly indoor or outdoor tools. Furthermore, farm women's lack of confidence meant that they often avoided responsibility for developing information systems for decision-making purposes. Bellamy, Webb, Mayocchi and Leitch (2002) of the Australian CSIRO Sustainable Ecosystems published a report of a cross-industry rural Australian study exploring the use of technologies for improved natural resource management. The findings of the project identified an improved adaptive ability in farm management by farm women due to increased use of computer-based decision support tools. This confirmed the findings of an earlier Australian study by Lewis (1998) of a strong association between innovative decision making by farmers and being informed through the use of computer-based management information systems. This paper extends knowledge from earlier studies temporally and theoretically as explained in the following section and is a contribution of the paper to both theory and literature.

THEORETICAL FOUNDATIONS

A great deal has been written about gender differences in the use of technologies. In this paper, the differences are explored using three contrasting theoretical perspectives. The first two viewpoints, those of essentialism and social shaping, are considered briefly; the paper focuses on the third theory, individual differences in gender and IT. Some gender studies advocate that inherent biological differences between the sexes explain the disparities in the use of technology. This is the essentialist argument examined in early studies by Turkle (1984), and later by Venkatesh and Morris (2000), and assumes that technology is gender-neutral. Juxtaposing essentialist assumptions is social constructivism. Social constructivism as proposed by Berger and Luckmann (1966) considers how social phenomena develop in particular social contexts; for example how technology may be socially shaped as a male domain. A growing body of feminist literature has examined the gendering of technologies in a variety of contexts (Trauth, Nielsen and von Hellens, 2000; Wajcman, 2000; Stewart 2004).

The third perspective, individual differences of gender and IT, is more recent and still evolving, and is the focus of this paper. Trauth (2002, 2006) identified the need for an alternative theory to explain the under-representation of women in IT (Trauth, Quesenbery and Morgan, 2004). According to Trauth (2006), individual differences theory represents the middle ground between the essentialist argument and the social constructivist perspective: individual gender differences exist on a

continuum since women are individuals. In other words, the proposed theory enables an investigation of “the individual variations across genders as a result of the combination of personal characteristics and environmental influences ... with the focus on differences within rather than between genders” (Trauth, 2006, p.1156). Ongoing work has continued to refine the emergent theory of individual differences with studies that explore the influence of socio-cultural factors on gender relations with respect to technology, the nature and value of diversity, and the underrepresentation of women in the IT profession (Quesenberry, Trauth and Morgan, 2006; Trauth, Huang, Morgan, Quesenberry and Yeo, 2006; Trauth, Quesenberry and Huang, 2008)

In summary, insights into gender differences in technology usage for farm management were to be provided by three distinct theories: essentialism, socially constructivism, and individual difference theory. The latter, an emergent theory with an emphasis on socio-cultural factors, was found to be very relevant to the study. Its application in an Australian farming context is a theoretical contribution of the paper.

RESEARCH DESIGN AND METHODOLOGY

The research design for the study followed the interpretive traditions of IS research. This approach assumed that the reality of farm management in family farm businesses, technology such as farm management software, and gender is socially constructed. Adam et al. (2004) argued that the social and organisational context has often been disregarded in research on gender and technology through a preoccupation with resisting functionalism and related deterministic views of technology. The consequence is that the topic of gender and technology is “inadequately studied and theorised” in the IS literature, particularly from the interpretive paradigm (Adam et al., 2004, p.222). As an interpretive study, themes emerged from the interview data. Data was gathered from 32 participants during the years 2002, 2003, and 2004, from several sources: three field studies of face-to-face interviews, telephone interviews, documents such as media texts and industry information resources, and participant observation of *CottonLOGIC* workshops, Women’s Industry Network for Cotton (Wincott) meetings, and Australian Cotton Conferences.

All study participants were selected according to a purposeful sampling strategy and were clustered into two stakeholder groups; the 17 participants of the first group were family cotton growers, mostly women, who were selected based on the following criteria: 1) farmed in the Australian eastern states of Queensland or northern New South Wales; 2) were responsible for - owned or managed - family farms (as distinct from farms owned by large corporations); 3) indicated an awareness of high-technology farming practices; and 4) were registered on a *CottonLOGIC* and/or Wincott database. The second group of participants consisted of 15 cotton industry professionals, namely, agronomists and consultants, rural extension officers, researchers and educators, rural experimental scientists, and *CottonLOGIC* developers who were also located in Queensland or New South Wales. As cotton industry professionals, all these participants had some knowledge of agricultural DSS either through development, usage, research, or teaching.

ANALYSIS OF TECHNOLOGY USAGE FOR FARM MANAGEMENT

In this section, gender differences in farm management practices and technology use are drawn from the interview data. Essentialism and social constructivism were found to be inadequate in explaining what was taking place, thus prompting the authors to consider the emerging theory of individual differences of gender and IT.

Inherent Gender Differences

The essentialist argument is that intrinsic or natural, biological differences determine reality where both gender and technology are perceived as fixed and immutable, and male and female characteristics are dichotomised (Adam et al., 2004).

Nicole and Helena, both cotton growers, identified that male farmers seemed reluctant to prepare farm accounts or fill out forms. Nonetheless, it was uncertain whether this was due to an innate inability or a preference for spending time outside.

Nicole (grower): *Men don’t like that sort of stuff. Men can’t handle bookwork.*

Helena (grower): *Fellows won’t do it – fill out forms like gun licences.*

Julia, another grower, deduced that perceived inherent differences may just be a convenient excuse for avoiding unpalatable tasks, and that men, in fact, can perform office work when it suited them or when there is no option.

Julia (grower): *... So I mean he [male farm partner] doesn't touch too much of the paperwork ... but fuel rebates or things like that. I think that is only because I said that you [male farm partner] can do that one.*

Ben, a male educator teaching cotton courses in a Queensland rural university, distinguished female students overall as more able, confident, and conscientious than many of the male students, who had a tendency to mask their lack of knowledge and ability with social chat. This did not deceive potential employers with the consequence that female graduates were in more demand as cotton consultants than male.

Ben (professional): *The female students tend to be very confident and some clients prefer to have access to the female consultants. A lot of male students tend to rely on the gift of the gab or the bullshit factor to communicate with growers whereas female students don't tend to be comfortable with that and they rely on ability. With some of the male students, they use the art of conversation to mask lack of ability whereas the female students are a little more honest and rely on their knowledge skills.*

George, a retired cotton industry professional, had consulted with numerous cotton growers, agronomists, extensions officers and agribusiness staff, also dichotomized how male and female cotton growers interacted with technology.

George (professional): *In general, women are less interested in seeing how it works than in what it can do. Men are very much interested in how it works and what technology problems it has ... and how to get the data in and out [of the computer]. When the data goes in and out, it's in analysing the data that the women come in.*

In summary, some interviewees were convinced that certain traits were male or female, such as the male farmer's tendency to avoid office work and women's innate penchant to be better students. However, other interviewees viewed these as preferences rather than inherent traits. To clarify this ambiguity, the notion that some roles had been socially constructed in the context of the family farm was explored.

Socially Constructed Gender Differences

There are several viewpoints to the social constructivist perspective of gender differences. The view adopted in this paper is the social shaping of technology approach which focuses on technology being socially shaped as a male domain (Cockburn, 1999; Wajcman, 2000). Trauth, Nielsen and von Hellens (2000) claimed that in order for women to be successful with technology, they must adapt to a masculine bias. According to the Australian rural literature, ideologies of both technology and family farming are socially shaped by a masculine culture (Stewart, 2004). Women's roles extend customarily from household manager to carer of children and elderly and are bound to the farm house (James, 1990) while men's roles are traditionally bound to agricultural production and marketing with more time spent outside (Alston, 2000).

Sarah and Helen are both growers, who expressed preferences for tasks classified as feminine, such as maintaining accounting records and up-to-date inventories for seeds, fertiliser, chemicals, and spray regimes, rather than outside jobs.

Sarah (grower): *I like keeping records not changing siphons.*

Helena (grower): *I want to keep records. I like keeping records.*

Julia, a grower, recounted her childhood experiences in a rural community which resulted in low self-esteem and a rejection of anything technological. Julia claimed that by developing useful computer skills and with the support of her farm partner, she overturned that attitude.

Julia (grower): *Our family, my parents didn't believe in Senior at high school but it wasn't really an option and as a girl I really felt you would get a job and get married. Education didn't really matter. ... then my husband actually bought me one [computer] for our wedding anniversary and he said well I think I should be able to do our books ... So I went and did an introduction to computers and scanning and Excel ... it was just for my own self – esteem. I find out I'm not as dumb as I thought and it was a real eye-opener for myself and it just gives you so much more confidence.*

However, Julia also preferred to drive a tractor than do housework and did not necessarily associate a tractor as being male technology.

Julia (grower): *If he needs me a bit, like if he's flat out. And I don't mind. I'm not a lover of housework. I've got a good excuse. I'd much rather go and sit on the tractor than do housework.*

The interview data strongly suggested that many of the interviewees viewed gender differences as socially shaped. However some interviewees such as Julia showed distinct differences from social norms, and overall the social construction view failed to provide a satisfactory explanation for these differences in farm management and technology use.

Individual Differences Approach to Gender and Technology

Individual differences theory assumes an interplay of individual personal characteristics with social and cultural influences. This theory has been extended to comprise three general constructs (Trauth, 2006; Trauth, Quesenberry and Huang, 2008). The first construct, *individual identity*, comprises personal and professional attributes such as age, race, job title, and the area of technical work. The second construct is *individual influences* or shaping factors; educational background, significant life experiences, and personal influences. The third construct is the *environmental context*, incorporating the influence of cultural attitudes and values. Individual difference theory proposes that collectively these constructs influence the individual relationships of men and women with technology (Trauth, 2006).

Individual Identity: Age

The majority of study participants were in the age range 25 to 44, and there was evidence of generational change within this age range. Selma, a grower, was outstanding in this regard. Her involvement in industry grower associations meant that her role on the farm extended beyond bookkeeping and human resources towards strategic production decisions. Selma was involved in marketing, selling and buying, as well as investment decisions, tasks which have traditionally been in the male domain. She had very firm views on the running of a successful cotton and cattle property, and the importance of good management. Therefore, it was Selma, not her farm partner Bill, who noted that he should have more involvement in farm management with a reduced emphasis on outdoor work. This comment implied a reversal of the commonly accepted attitude that inside office work (unlike outside physical work) is not considered to be real work.

Selma (grower): *I'll deal with interest rates. I'll sell cotton. I'll make decisions about options, and things like that. He'll [farm partner] have no hassles with that. He's a fair bit more liberal than the traditional guys. We work as a team really. I'm more focussed on the administration side of things. Bill is more focussed on the day-to-day running, and keeping out of the office which he shouldn't do. He needs to be more involved. I think Bill's a bit different to most of the farm blokes around. I know blokes who don't let their wives get mail from the post office.*

Researcher: *Is that [in] your age group?*

Selma (grower): *No, I'm talking [about women who are] another ten years older. Oh, yeah, twenty years older.*

However not all older women conformed to the generational divide. Sigrid, an experimental scientist with the CSIRO, illustrated with an example of her own parents.

Sigrid (professional): *I think each individual case is different. Some women have absolutely no idea what their husband is doing [on the farm]. Some work together, and some like Mum and Dad are more into collaboration. Dad's out there feeding the stock and Mum's doing the accounts. While he's on a tractor, she may be moving a mob of sheep, or she may have some cattle out on the road*

Individual Influence: Educational Background

While many of the women cotton growers had some measure of difficulty using *CottonLOGIC*, Uma who had been tertiary trained as an agronomist used *CottonLOGIC* with ease.

Uma (grower / professional): *It's not a difficult program to use really. I don't find it difficult.*

For Reese, a young consultant, her agronomic training meant that to her *CottonLOGIC* was not complex.

Researcher: *With CottonLOGIC and the workshop, did you get out of it what you wanted?*

Reese (professional): *Yes, I got a lot out of it. Because I basically taught myself how to use it, like just going in and mucking around and figuring out what different types were.*

George, a retired cotton industry professional, observed that gender distinctions were not especially noticeable in the workplace although they were apparent in the setting of the family farm where gender divisions of labour were more usually applied.

George (professional): *When the women have a professional background, the distinction between men and women disappears. If we look at the female consultants, they have the same issues as the men, generally speaking distinctions disappear. It's when they come back in the family roles ...*

According to Powell and Johnson (1995), empirical evidence suggests that in a formally trained population, with similar levels of experience and intellectual ability, and with equal access to information, gender differences in the nature and quality

of decisions are not significant. In terms of this study, it appeared that appropriate and adequate formal training in agronomy reduced the gender distinctions in software use, even if agriculture has been socially constructed as a male domain.

Environmental Influences: Cultural Attitudes

The third construct is environmental influences. In Australia, farming is still male-dominated and Australian women cotton growers have recently formed a women's support network Wincott for social networking and to increase technical knowledge. Wincott (2009) is an organisation that aims to provide support, information and resources to encourage and empower women in the cotton industry to attain skills, confidence and to have an informed 'voice' in the agricultural sector.

Diane, a grower service manager for an agribusiness, observed that, in the main, women continue to be excluded from rural decision making and industry leadership positions while they struggle with technical skills and agronomy know-how. Nevertheless, there was alleged opposition from some male farmers who felt threatened by the possible encroachment of the women on their agricultural patch.

Diane (professional): ... *however what they [male farm partners] don't realise is that a lot of women don't have that science and fulltime background, then they'll never be engaged as an equal in those sorts of the conversation, even if they do know exactly what they are talking about ... some of the men are a little bit threatened about the formation of women's group ... oh why do you need to do that, why do you need something special for you guys?*

Diane noticed that women were often just as interested in the more technical aspects of production as the men. They appreciated being able to learn and work alongside their male farm partner.

Diane (professional): *The other thing I find interesting is when they have the IPM [Integrated Pest Management] courses, even leadership courses and things like that, it's never just the blokes that go, it's the blokes and their wives. I think that shows their interest.*

Consequently, it is apparent that many of the farm women no longer regard skills in technology and farm management as solely a male's domain. Rather, the consensus was that the task should be performed by the person best suited to doing it. In reality, the onus is on the individual, within the bounds of abilities, preferences, farming demands, and family constraints, rather than broader societal expectations. This is a more reflexive and honest approach to relationships in gender, technology and farm management and is the one which offers farm management the most potential by the harnessing of diversity.

CONCLUSION

This paper has provided an interpretive account of the socio-cultural aspects of information systems use on Australian family cotton farms informed by three theoretical perspectives on gender and IT, namely essentialism, social constructivism and individual differences. The study revealed that tendencies existed to dichotomise farm responsibilities along gender lines through a preoccupation with intrinsic male and female characteristics. For example, females were reputed to be less interested in technology per se but more conscientious students than males. The basis for these gender distinctions was not clear and may have been due to the fact that roles had been socially constituted in the context of the family farm. That is to say, by and large, women growers worked in the home office while their male partners appeared to be more comfortable away from the house and out in the fields. This confirmed the earlier findings of Stewart (2004) that both technology and farm roles are socially shaped. However, social shaping theory did not completely explain differences within and between genders. Evidence from the study suggested that the combination of social and cultural influences such as age, education, and cultural attitudes had helped to shape these outstanding women with their individualistic approach to technology and farm management.

The study documents growing evidence of individual differences in the interaction of cotton growers with technology and farm management. For instance, several women displayed a penchant for performing tasks such as irrigating or selling cotton that had traditionally been male roles while some men ably assisted in household duties when necessity dictated. By supplanting the essentialist and socially constructed approaches to gender differences, the study gave validity to the emerging individual differences theory. Further studies in this field may benefit from entering the nature versus nurture debate. By exploring the balance between hereditary and environment, there is an opportunity to raise the discussion from an individual level to society in general.

REFERENCES

1. Adam, A., Howcroft, D. and Richardson, H. (2004) A Decade of Neglect: Reflecting on Gender and IS, *New Technology, Work and Employment*, 19, 3, 222-240.

2. Allan, J. (2005) Farmers as Learners: Evolving Identity, Disposition, and Mastery through Diverse Social Practices, *Rural Society*, 15, 1, 4-21.
3. Alston, M. (1995) Women on the Land: The Hidden Heart of Rural Australia, University of New South Wales, Kensington, NSW.
4. Alston, M. (Ed.). (1998a) Australian Rural Women Towards 2000: An Edited Collection of Papers on Women in Rural Australia, Centre for Rural Social Research, Charles Sturt University, Wagga Wagga, NSW.
5. Alston, M. (1998b) There are just no Women out there: How the Industry justifies the Exclusion of Women from Agricultural Leadership, *Rural Society*, 8, 3, 197-208.
6. Alston, M. (2000) Breaking the Grass Ceiling: Women, Power and Leadership in Agricultural Organisations, Harwood Academic Publishers, Amsterdam, The Netherlands.
7. Alston, M. (2003) Women's Representation in an Australian Rural Context, *Sociologia Ruralis*, 43, 4, 474-487.
8. Bellamy, J. Webb, V., Mayocchi, C. and Leitch, A. (2002) Improving resource management through rural women's use of new technology: a pilot study in impediments and opportunities for learning activities, CSIRO Sustainable Ecosystems, Brisbane, Qld.
9. Berger, P. and Luckmann, T. (1996) The Social Construction of Reality, Doubleday, New York.
10. Board, H. (1997) Rural Women, Policy and the Process of Change in Australia Agriculture, *Proceedings of Rural Australia: Towards 2000 Conference*, Centre for Rural Social Research, Charles Sturt University, Wagga Wagga, NSW.
11. Bryant, D. L. (1999) Computers on the Farm: farmers' usage patterns and impact on farm management, Rural Industries Research and Development Corporation (RIRDC), Canberra, ACT.
12. Cockburn, C. (1999) Caught in the wheels: the high cost of being a female cog in the male machinery of engineering, *The Social Shaping of Technology*, Open University Press, Buckingham, UK.
13. Hearn, A. B. and Bange, M. P. (2002) SIRATAC and CottonLOGIC: persevering with DSSs in the Australian Cotton Industry, *Agricultural Systems*, 74, 27-56.
14. James, K. (1990) Women's Decision-making Extended Family Farm Businesses, Key Papers Number 1 Rural Women, Centre for Rural Welfare Research, Charles Sturt University, Wagga Wagga, NSW.
15. Lewis, T. (1998) Evolution of Farm Management Information Systems, *Computers and Electronics in Agriculture*, 19, 233-248.
16. Mackrell, D. (2006) Women as Farm Partners: Agricultural Decision Support Systems in the Australian Cotton Industry, PhD Dissertation, Griffith Business School, Griffith University, Brisbane Australia.
17. Martz, D. (2006) Canadian Farm Women and their Families Restructuring, Work and Decision Making, unpublished PhD, Department of Geography, University of Saskatchewan, Saskatoon Canada.
18. Powell, P. L. and Johnson, J. E. (1995) Gender and DSS design: the research implications, *Decision Support Systems*, 14, 27-58.
19. Quesenberry, J.L., Trauth, E.M. and Morgan, A.J. (2006) Understanding the 'Mommy Tracks': A Framework for Analyzing Work-Family Issues in the IT Workforce, *Information Resources Management Journal*, 19, 2, 37-53.
20. Stewart, J. (2004) Gender as a Factor in the Uptake and Use of ICTs on Family Farms in Southern Queensland Australia, *Gender Technology and Development*, 8, 97-117.
21. Trauth, E. M. (2002) Odd Girl Out: an individual differences perspective on women in the IT profession, *Information Technology and People*, 15, 2, 98-118.
22. Trauth, E. M. (2006) Theorizing Gender and Information Technology Research, *Encyclopedia of Gender and Information Technology*, E. Trauth (Ed.), Idea Group Inc, Hershey, PA.
23. Trauth, E. M. and Howcroft, D. (2006) Critical Empirical Research in IS: An Example of Gender and the IT Workforce, *Information Technology and People*, 19, 3, 272-292.
24. Trauth, E. M., Huang, H., Morgan, A. J., Quesenberry, J. L. and Yeo, B. J. (2006) Investigating the Existence and Value of Diversity in the Global IT Workforce, *IT Workers: Human Capital Issues in a Knowledge-Based Environment*, Niederman, F. and Ferratt, T. (Eds), IAP-Information Age Publishing, Greenwich Connecticut.
25. Trauth, E. M., Nielsen, S. and von Hellens, L. (2000) Explaining the IT Gender Gap: Australian Stories, *Proceedings of the 11th Australasian Conference on Information Systems (ACIS)*, Brisbane, Qld.

26. Trauth, E. M., Quesenberry, J. L. and Huang, H. (2008) A Multicultural Analysis of Factors Influencing Career Choice for Women in the Information Technology Workforce, *Journal of Global Information Management*, 16, 4, 1-23.
27. Trauth, E. M., Quesenberry, J. L. and Morgan, A. J. (2004). Understanding the Under-Representation of Women in IT: Towards a Theory of Individual Differences, *Proceedings of the ACM SIGMIS Computer Personnel Research Conference*, Tucson, AZ.
28. Turkle, S. (1984) *The Second Self: Computers and the Human Spirit*, Simon & Schuster, New York, USA.
29. Venkatesh, V. and Morris, M. G. (2000) Why don't men ever stop to ask for directions? Gender, social influence and their role in technology acceptance and usage behaviour, *MIS Quarterly*, 24, 1, 115-135.
30. Wajcman, J. (2000) Reflections on Gender and Technology Studies: In What State is the Art?, *Social Studies of Science*, 30, 3, 447-464.
31. Wilson, M. (2004) Conceptual Framework for Studying Gender in Information Systems Research, *Journal of Information Technology*, 9, 81-92.
32. Wincott (2009) Women in Cotton Industry Network, downloaded January 2009, <http://www.wincott.net.au>.