

8. Perhaps it's time for a fresh approach to IS/IT gender research?

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Abstract

The aim of this paper is to demonstrate the value of the adoption of a feminist epistemology in information systems and information technology (IS/IT) gender research. Much of the research undertaken in IS/IT in relation to gender issues adopts a positivist philosophy. A feminist research approach is rarely used in IS/IT gender research. This is despite the fact that it is generally accepted that the IS/IT workplace is 'gendered' and embodies a tacit masculine norm. This paper adopts a feminist research approach in a case study that explores imbalance in Tasmanian (Australia) IS/IT workplaces. The aim of the research was to disclose common characteristics of women currently working within the industry and to consider the factors that could impact on women moving to or being placed in IS/IT positions. Clearly a research approach that enables the researcher to explore the perspective of the research participant and as a consequence offer some insights into the declining gender balance in the field offers significant benefits.

Introduction

Since the inception of the IS/IT industry women have been an under-represented human resource (Nielsen et al., 2000; Panteli et al., 1999; Ahuja, 2002; The Women in Science Engineering and Technology Advisory Group, 1995). In addition, many women who gain professional qualifications in the area and enter the industry do not remain (O'Neill and Walker, 2001). Largely, the problem has been attributed to a dominant male culture in the IS/IT field. The ongoing gendered environment in IS/IT has been defined as the perpetuation of the 'old corporate boys' club syndrome (O'Neill and Walker, 2001, p. 118). This implies that while women are not precluded from entering the industry, little action is taken to recruit them or foster their career advancement opportunities through involvement in managerial decision-making.

To date much of the research examining gender issues in IS/IT is framed within a positivist philosophy and uses quantitative methods. The value of this stream of research is the measurement and quantification of the extent of the gender imbalance in the industry. Generally the focus is on attempting to put in place policies and strategies to address the problem (Pringle et al., 2000). However this approach has been criticised because it largely seeks to 'add more women' and fails to acknowledge and address the need to change the gendered culture in IS/IT workplaces if, indeed, this is possible (Adam et al., 2002).

There are few examples of research that use a subjectivist approach and qualitative method focusing on the gender imbalance in the IS/IT industry. There are even fewer examples of research that have explicitly adopted a feminist research approach.

Adam (2001) argues that the adoption of feminist theory in the study of gender within IS has the potential to reap benefits in three ways. These are:

1. support for IS commitment to social and cultural aspects;
2. commitment to emancipatory action that results in the revelation of previously hidden viewpoints, thus contributing to knowledge; and
3. emphasis upon the minority or repressed being involved in the development of their own methods for liberation.

In response, the aim of this paper is to adopt a feminist epistemology to demonstrate that this approach has the capability to build a rich insight into the experiences of women currently working successfully in the IT industry in Tasmania. In the short term it is not feasible to expect a change in the dominance of a male culture in IS/IT. However, reporting the experiences of women who have achieved in the industry is a positive move to weaken the extent of this domination and potentially attract women in larger numbers to careers in the IS/IT field.

Background

The aim in this section of the paper is to briefly outline the nature of IS as an emerging discipline, the imbalance of women in the IS/IT industry, the scope of IS gender research and then to offer an insight into feminist research. From this background the research questions posed in this paper are then presented.

IS as an emerging discipline

As a relatively recent discipline, IS draws on a range of reference disciplines. The major sub-disciplines are in turn focused in a different set of sub-disciplines (Robinson and Richardson, 1999). The primary reference disciplines have been identified as computer science, management science, organisational science, cognitive science and economics. The secondary reference disciplines are sociology, information science, linguistics, anthropology, ergonomics and systems science (Khazanchi and Munkvold, 2000). This implies that research from an IS perspective draws on a wide range of domains of study, strategies and methods (Marble, 2000; Robinson and Richardson, 1999). Because of this, IS is often criticised for its diversity and fragmentation, which are seen as precluding an ability to become a mature discipline with a cumulative research tradition (Robinson and Richardson, 1999).

At the same time IS has been acknowledged as having 'subject matter that is so central to contemporary society' (Robinson and Richardson, 1999, p. 3) that is subjected to continuous change (O'Donovan and Roode, 2002). While there is pressure for IS to consolidate, this does not imply that IS research should be static, but rather it should be open to innovative ways of doing research. The application of a feminist epistemology, as demonstrated in this paper, is one example. The aim in adopting this approach is not to offer an alternative epistemology but to show that, in IS gender research, a feminist approach can be beneficially applied (Adam and Richardson, 2001).

The imbalance of women in the IS/IT industry

In most Western countries women remain a minority in the IT industry (Trauth et al., 2003). UK women were found to be a minority in all areas of the IT industry in the

country (Panteli et al., 1999). In European countries only 25% of those working in the industry are women, while in the United States the figure has been reported as being as low as 20% (Ahuja, 2002). All indications are that the situation in Australia follows these patterns. In contrast to other areas within science and technology such as engineering, where numbers of women studying and working are increasing, the number of women studying and entering the IS/IT industry is actually declining (The Women in Science Engineering and Technology Advisory Group, 1995).

Little research has been done within the IS/IT industry that has explored the experience of women and how it can be used to address the continuing problem of gender imbalance. 'Most research on women in the information technology (IT) industry has been concerned with practical questions: measuring disadvantage, establishing causes, and attempting to put in place policies and strategies that will rectify the situation' (Pringle et al., 2000).

The scope of IS gender research

Much of the literature considering gender issues in IS/IT is framed within a positivist philosophy and uses quantitative methods to examine the research problem (Ahuja, 2002; Igbaria and Baroudi, 1995; Holmes, 1998; Khazanachi, 1995; Truman and Baroudi, 1994; Baroudi and Igbaria, 1994; Frenkel, 1991). While this research identifies the extent of the gender imbalance, it is largely based on dichotomising IT professionals on the basis of biological sex. This means that females are seen as a stereotypical group and individual differences are not considered (Adam et al., 2002). Accordingly, the effectiveness of this approach is limited as it precludes the opportunity to gain any insight into the personal experiences of women who have become IS professionals and subsequently continue to successfully work in the industry.

There is little evidence of IS gender-focused research based on a subjectivist approach using qualitative methods (Pringle et al., 2000; O'Neill and Walker, 2001; von Hellens et al., 2001; Trauth, 2002; Webb, 2002). Within these examples, while Trauth (2002) and Webb (2002) are explicitly presented as feminist research, the work reported by Pringle et al. (2000) implicitly adopted this stance. Subjectivist research enables the researcher to explore the research problem in greater detail from the perspective of the research subject. While subjectivist research cannot usually be easily generalised to the wider community it can, and does, have the capacity to highlight areas and issues that may benefit from further investigation and discussion.

Feminist research

A fundamental aspect of feminist research is that it is conducted for women rather than on women (Reinharz, 1992; Reynolds, 1993). It involves a broad and dynamic theory within which numerous positions exist (Millen, 1997). Central to feminist research are goals of social change and improved representation (Humphries, 1997). It must also be believed that women have been oppressed and not treated fairly, and that there is action that can be taken (Grimshaw, 1986). Further, the role of the researcher and the researcher's rapport and familiarity with the participant is also important in feminist research (Reinharz, 1992). Feminist research lends itself to the use of qualitative methods enabling the researcher to explore each woman's individual perspective. While quantitative research methods and a feminist epistemology are not mutually exclusive it would be uncommon to find quantitative methods, with its focus on hard, numerical data used for feminist research (Stanley, 1990; Neuman, 2000).

Feminist research often uses case studies to analyse change in a situation over a period of time, the significance of a situation for the future and the connections between com-

ponents of a situation (Reinharz, 1992). The use of semi-structured interviewing in feminist research is significant. It enables the use of open questions and provides the capacity to encourage participants to give lengthy and full responses in their own words. 'Feminist researchers find interviewing appealing for reasons over and above the assets noted by social scientists who defend qualitative methods against positivist criticism' (Reinharz, 1992, p. 19). Semi-structured interviews are seen as offering access to people's ideas, thoughts, and memories and real life experiences in their own words rather than the words of the researcher (Reinharz, 1992; Dallimore, 2000). To achieve this outcome it is important that considerable rapport is developed between the researcher and the participant, as this is a fundamental prerequisite in feminist research.

From this background, the research presented in this paper draws on a feminist epistemology to demonstrate that it is an appropriate approach in IS gender research. In so doing it is acknowledged that there is gender imbalance in information systems workplaces and it is likely that there are factors at work that inhibit or reduce the likelihood that women will participate in equal numbers with men. It may be that oppression exists and this has contributed to the inequality. Further, it is recognised that, due to the exploratory nature of the research, no immediate change is likely to occur as a result of it. It may, however, lead to further research and subsequent actions to effect change and therefore meets yet another criterion in adding support for a feminist stance. When these conditions apply they represent the subtle distinction between a feminist epistemology and a subjectivist approach.

The aim of the research is to disclose common characteristics of women currently working within the industry and to consider the factors that impact on women moving to, or being placed in, IS/IT positions. To address this objective the following questions are posed:

1. What are the factors influencing the careers of women in IS/IT?
2. What are the characteristics of women working in IS/IT roles in Tasmania?

Method

To demonstrate the application of a feminist epistemology within IS gender research, the research presented in this paper uses a case study approach involving semi-structured interviews conducted with women who are successfully working in the IS/IT industry in Tasmania. The adoption of a case study strategy is supported by the view of Reinharz (1992) that feminists use case studies primarily to analyse the significance of a situation. While there is an absence of research that directly relates to gender imbalance within the IS/IT industry in Tasmania, this research is founded on an assumption that any discriminatory practices found in this state are likely to mirror the situation elsewhere.

Participant recruitment

To recruit participants for the case study the primary researcher attended a social event hosted by the Women in Information Technology Tasmania (WIITT) group. WIITT is a special interest group constituted under the auspices of the Australian Computer Society (ACS). At this event she was able to address the group and provide an outline of the research and invite the women in attendance to volunteer to participate. A brochure providing an overview of the research and the participants' expected contribution was made available at the event. Within a feminist research perspective this personal approach was an important initial step in the development of rapport with potential participants.

At this gathering between six and nine volunteers were sought to participate in interviews. This number of interviews was established by reference to the limitations of the

time and the resources available for this research. Based on the qualitative literature, the appropriate number of interviews is dependent upon the projected depth of analysis and the proposed representativeness of the research (Connell et al., 2001). In any case, that evening six women volunteered to participate. It was interesting to observe that most of the women approached by, or who themselves approached, the researcher during the course of the evening expressed their interest in the research but also expressed their reservations regarding the relevance of their contribution. Comments like *'I don't think I'm the right person to speak to'* or *'I'm not sure if I really do the right kind of work – I'm not very technical'* were common although a few questions generally showed that the women were indeed employed in the IS/IT sector. Comments such as these are perhaps indicative of the fundamental difference in approach that women exhibit compared to men in similar roles in the industry.

The choice of research participants was based on the following criteria. The women needed to be currently working in IS/IT in either the public or private sectors in Hobart, readily accessible and willing to take part in the research and available for an interview during the required research time of the research.

Subsequent to the WIITT social event two more women volunteered to participate. This brought the total number of volunteers to eight. The potential participants were contacted shortly after the WIITT event to thank them for their offer of participation and to let them know that they would be contacted again to organise the interview. They all expressed their ongoing support for the research. In keeping with a feminist epistemology this second personal contact was yet another occasion to build rapport with the women who were prepared to contribute to the research.

Data collection and analysis

Data collection was based on the use of semi-structured interviews that aimed to encourage participants to provide their own views and perspectives of their experiences working in an IS/IT work environment. A combination of open and closed questions was used. The majority of the questions began with 'how' or 'what' as a reminder to keep the question broad and open, and were worded to encourage descriptive replies. For example: *'How did you get into information systems?'* and *'What do you envisage for yourself in your professional career?'*

A prepared interview guide was also used to stimulate discussion. This was based on the personal experience and understanding of the primary researcher, gained from working for a number of years in the IS/IT industry. It provided a solid starting position, and offered the ability, when appropriate, to pursue interesting responses with probing questions.

Pilot Interview

Prior to the main interviews a pilot interview was conducted to ensure the questions were easily understood, to test the application of the interview guide and assess the pace necessary to complete the interview. The pilot took place with a female IS professional who had lengthy experience working in the IS/IT sector in Tasmania. It was completed within the projected 60-minute time frame and the interview schedule worked effectively in encouraging the woman to relate her personal experiences of working in the IS/IT industry.

Main interviews

The eight main interviews took place in June and July 2002 and were conducted at venues and times suitable to the participants. To maximise the level of comfort and increase the likelihood of full, comprehensive and frank responses, the women taking part were assured the interviews would be treated as confidential and no identifying information would be incorporated into transcripts or subsequent analysis.

With the permission of the participants the interviews were tape recorded to enable the researcher to capture the exchange with a high degree of accuracy. None of the participants declined to have the interviews recorded. The intention, where the participants indicated their willingness to do so, was that the transcripts would be provided to them for checking. This approach was used to fulfil a validity test involving collaboration.

Interview transcription

Each interview was transcribed within 48 hours of completion. This was done to complete the task while the memory of the researcher was still fresh, thereby reducing the risk of error in the transcription should any words be indistinct on the tape. This approach proved to be very successful with all but one of the tape recordings. The exceptional recording was indistinct in parts due to high levels of background noise in combination with a very softly spoken participant. Because the transcription was completed in a timely manner the majority of data from this interview was recovered.

Data coding and analysis

The interviews were transcribed into Microsoft Word and then entered into an Excel spreadsheet to facilitate the detailed breakdown of the data that qualitative analysis demands. The aim of coding in qualitative analysis is to shatter the data and then manipulate it into groupings that can be compared and regrouped (Maxwell, 1996). In coding the data, a three-stage bottom-up coding process was adopted: open, axial and finally selective.

Findings

The analysis and interpretation revealed three major themes in the data: *supermum factor*, *serendipity* and *culture*. The major themes incorporated ten sub-themes, which are summarised in Table 8.1.

Table 8.1. Research findings

Major themes	Sub-themes
Supermum factor	societal expectation; work-family balance; support
Serendipity	skills; adaptive behaviour; outlook
Culture	paucity; definition; gender traits; distinction

Even though relationships were revealed both within themes and between themes, for clarity and simplicity, each theme and the underlying sub-themes will now be presented individually.

Support for the identified themes will be presented through use of quotations drawn from the interview transcriptions. Due to the space limitations of this paper, the quotations provided are usually just one example from among many alternatives available from the findings. The use of quotations to support interpretation follows an established technique used to demonstrate the validity of the findings (Whittemore et al., 2001). It also provides the women participants a voice to examine, explain and explore the findings (Broido and Manning, 2002).

Supermum factor

The *Supermum factor* can be interpreted as the external influences on the work choice of the women. As shown in Table 8.2, it contains three sub-themes: social expectation, work-family balance and support. The supermum aspect of the findings recognises the impact and value of support from both the family and from employers in helping to achieve a sustainable balance between work and family. It acknowledges the struggle experienced by women striving for excellence in both the work and family areas of their life within a framework of societal expectation. The data subtly demonstrated the existence and impact of societal expectation and also illustrated the changing nature of societal expectation. The amount and form of support provided to the women was also impacted by societal expectation.

Table 8.2. Supermum sub-themes

<i>Supermum sub-themes</i>	<i>Illustrations from the data</i>
Social expectation	Participant #6: She actually had to leave work at the end of the year she got married.
Work and family balance	Participant #3: And I think that ... as women are starting to or as society is starting to accept that ... it is not automatic for women to have short-term careers and go off and have families during their twenties.
support	Participant #3: It has been damn hard to combine a family with study and with full-time work and I think that's a real challenge. I think that the community and the industry could reap so many benefits if they allowed a little flexibility.

Serendipity

This theme encapsulates the skills, qualities and attitudes of the participants as represented by the data. It has been so named because of the strong sense of the role of fate or luck expressed by the women.

Participant #6: 'well it's just... serendipity. I mean that's how life is isn't it?'

It can, however, be demonstrated from the data that luck probably contributed less to the women's progress and success in their careers than did the skills, outlook and the adaptive behaviours these women used to survive and thrive even though they were and remain a minority in a male dominated environment. The sub-themes, along with supporting quotations from the data, are shown in Table 8.3. While there were examples of a range of skills in the data (interpersonal communications, problem solving/analytical skills, and skills in mathematics and science) there did not appear to be a single core skill set among the participants. However, the outlook of the participants and any consequent adaptive behaviours evidently do not occur independently of the skill set of the individual women concerned.

The outlook sub-theme was arguably the most exciting finding in the research, revealing as it did a set of common qualities shared by the women participating in this research. It highlighted some strong aspects including displaying a positive attitude, excitement and enthusiasm for their work and life. The women welcomed change and opportunity to the extent that some participants spoke of the need for stimulation and a commitment to continuous learning. Paradoxically, there was also a sense of insecurity and lack of confidence among the participants. There was also some evidence of self-awareness and the recognition that insecurity and lack of confidence were not justified when skill and ability were considered.

Table 8.3. Serendipity sub-themes

<i>Serendipity sub-themes</i>	<i>Illustrations from the data</i>
Skills	Participant #1: And I get on equally well drinking at the pub with the riggers as I do talking to, when you're doing a customer presentation and talking to management. Participant #2: ... but I am a fairly, you know, organised kinda person so just organise yourself and you get by. Participant #7: I have a degree in maths and physics.
Outlook	Participant #4: I sort of suddenly began to realise that it was within my reach to do something that was ... in demand and current like to me it just seemed so ... oh, so exciting so ... my mind was set then. Participant #4: And yet ... it was so easy when I did it.
Adaptive behaviours	Participant #6: Because lovely though they are, if you were a real sensitive sort you would find some of their jokes really appalling.

Culture

As shown in Table 8.4, the final main theme of *Culture* is based on four sub-themes: paucity of women in IS/IT, definition of IS/IT, gender traits and the distinction in approach and support. These sub-themes combine to create the environment within which the women carry out their IS/IT work-related activities.

There was some sense that the low numbers of women in IS/IT may have impacted on the culture and environment within the IS/IT workplace. Potentially, it has served to perpetuate the dominant male culture. The nebulous nature of IS/IT was revealed by the data, with no common perception among the women participating in the research. From the data it was clear that there was a perception that men and women, in general do have subtle inherent differences and that this impacted on the way they operate and interact. There was also recognition that the description of gender traits relies heavily on generalisation and stereotyping.

The distinction sub-theme encompasses discriminatory behaviour that the participants had experienced. A common view from the data was that the women had not experienced barriers within their workplaces, although they acknowledged the existence of barriers in a more general sense.

Table 8.4. Culture sub-themes

<i>Culture sub-themes</i>	<i>Illustrations from the data</i>
Paucity of women in IS/IT	Participant #2: Yeah no, I suppose after 30 something years you get used to working in that environment.
Definition	Participant #8: ... this is where I struggle a bit with being classified as being in information technology (this participant included, among other responsibilities, management of a WAN as part of her duties).
Gender traits	Participant #2: So then most women I suppose it's part of being a woman, you kinda have a bit more ... you accept that you're going to be asked questions and you're prepared for it more whereas guys seem not to like that kind of thing.
Distinction	Participant #6: And he actually complimented me by telling me I was almost a bloke, almost a man, as far as my work went, you know.

Validity

Feminist research has been accused, in a similar way to interpretivism and critical social science, of being wanting in the area of validity (Dallimore, 2000). To address the issue in the present research, with reference to Dallimore (2000) and Neuman (2000), collaboration, natural history, and member validation were applied.

In purposefully building rapport with participants, as consistent with a feminist approach, the researcher addressed validity through collaboration. The relevant industry

experience of the researcher helped to frame the questions and assisted in drawing out rich and detailed responses. This personal interest could be perceived as providing potential for bias. This was readily acknowledged and in so doing the likelihood that it would be successfully managed was increased. Validity can also be demonstrated in the manner that the findings truly represent the views of the participants. In this research participants were offered the transcript to review and provide feedback on its accuracy. Only one woman chose to review the transcript and that participant did not request any changes to its content.

In the present research, the researcher has provided a detailed description of the philosophy, processes, methods and approaches in order to comply with a natural history test of validity (Neuman, 2000). The researcher set out to faithfully record all aspects of the research to ensure validity in the eyes of other readers.

The final method of validation used within this research was that of member validation. When the findings of the research are provided to the participants and they are able to identify their situation as reflected in the findings, its validity is supported. Member validation can, however, be difficult to achieve. Despite the research presenting a truthful portrayal, participants may have personal motivations for disagreeing with the findings. This was evidently not the case in the present research:

Thank you ... for sending me your findings. I can identify with a lot of what you say, especially 'It would appear from the data that being valued, encouraged and supported in their family and career was important ...'

and:

I can definitely identify with the findings of your research and with the other women interviewed. Especially the serendipity theme – we all think we're just lucky but in reality we're pretty damn good aren't we?

Discussion

In addressing the objective of this research the application of a feminist research approach has proved to be beneficial. It could be argued that some of the factors influencing the careers of women in IS/IT and the characteristics of these women may have been identified using a positivist research approach, and others obtained from the use of a qualitative approach. However, it is proposed that the findings have extended to uncover subtle factors and characteristics of individual participants that could only come from the use of a feminist approach. Central to this is the fact that the research was conducted for women, not on women. In addition, in the context of feminist research the extent of rapport and element of trust between the participants and the researcher is critically important, and in the research reported here it was clearly very good. Unless this rapport and trust exists then participants do not feel comfortable giving comprehensive, open and truthful responses. The high level of rapport and trust is evidenced by the fact that the only woman who asked to read the transcription of the data subsequently did not request any changes to her interview dialogue. In addition the remaining participants obviously had confidence in the researcher to the point that they did not even want to review the transcription of their interviews. There was also a general consensus that the women readily identified themselves in the findings of the research. This implies that the women taking part were given a voice and not just treated as a stereotypical group based on their biological sex. This research has, therefore, provided a new perspective with the ability to extend understanding in IS gender research.

A number of factors were identified that influence the careers of women in IS/IT workplaces. One significant factor was that of societal expectation. While this was acknowledged as changing, it can still place considerable pressure on women who are attempting to balance work and family in pursuit of a career; the requirement to be a supermum. The findings have shown that support was crucial for the women in their career endeavours. However, it became evident from the transcripts that sometimes the extent of this support was less than ideal. The example quoted from participant #4 supports this view. While she acknowledged the support of her husband, there was still an expectation that she was responsible for going home to make dinner. Potentially this could imply that while the husband was prepared to be supportive, societal expectation was still influential in that there remained in his mind a clear division of labour on the basis of gender.

The women contributing to this research were a highly intelligent group holding tertiary qualifications, not necessarily in IS/IT, but in mathematics, physics or science. They were willing and interested to take part in this research even though initially they were unclear about their role within IS. As highlighted in the findings, the serendipity sub-theme 'outlook' was arguably the most exciting result in the research. While a particular core skill set was not found among the participants, when those they had were combined with a positive outlook, the women, as individuals, were able to use adaptive behaviours to succeed and thrive in what was often a discriminatory work environment. The women readily acknowledged that they were a minority in the IS/IT industry with many of the participants dismissing the male culture dominance as of no consequence.

Conclusions

A research approach that enables the researcher to explore, in some depth, the perspective of each female research participant and, as a consequence, offer some insights into the declining gender balance in the IS field, offers significant benefits.

Adopting a feminist research approach has enabled the researcher to:

1. develop and establish a rapport with the participants to a level and depth that would be difficult with alternative approaches; first in a convivial social situation and then on a personal one-on-one basis;
2. inform the research process based on her own experience and to extend and explore issues with participants based upon that experience, resulting in richer data and a greater insight into the research problem; and
3. gain a richer and more detailed insight into the research problem through the explicit adoption of a research approach that supports women in challenging and confronting a situation that requires social change.

This paper has provided an example of research conducted using a feminist approach and qualitative research methods to demonstrate that it is a viable alternative in IS gender research. The approach was beneficial in conducting this research as it enabled the researcher to explore the research problem more fully and in greater depth. The individual women participants were given a voice and as a group their combined wisdom was illuminating. However, as acknowledged at the beginning of this paper, due to the exploratory nature of the research and the nature of the issues investigated, little if any immediate change is likely to occur as a direct result of this study.

Nevertheless, perhaps now the time is right for researchers studying gender issues within IS to consider potentially useful alternative approaches to the more conventional ways. The worsening gender imbalance in the IS/IT discipline demands new and innov-

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ative approaches and the need to ensure that the views of women are adequately represented in the workforce should provide a powerful catalyst to action.