



**Gender and Technology:
Women's experiences in an undergraduate
nursing program**

**by Judith Manning RN
Bachelor of Education, Sturt CAE 1980**

**A thesis presented to Faculty of Arts
of the University of Adelaide
for the Degree of
Master of Arts (Women's Studies)**

**Department of Women's Studies
University of Adelaide**

January 1997

Declaration of Originality

This work contains no material which has been accepted for the award of any other degree or diploma at any university or tertiary institution and, to the best of my knowledge and belief contains no material previously published or written by another person except where due reference is made in the text.

I give consent to this copy of my thesis, when deposited in the University Library, being available for loan and photocopying.

Judith Manning

Acknowledgements

This thesis would not be possible without the participation and contribution of the eight women who freely gave of their time and shared their feelings, perceptions and ideas with me so willingly and enthusiastically. My gratitude and sincere thanks are extended to each of you.

My appreciation and sincere thanks are extended to:

Margaret Allen: Head, Department of Women Studies who facilitated this project through her rigorous, constructive criticism, scholarly interaction, supervision and enthusiastic support throughout this study;

Margie Ripper: Postgraduate Coordinator who also facilitated this project through her enthusiasm, interest and constructive criticism of the topic;

Edwina McConnell for her support throughout the project, her diligence and attention to detail when reading the manuscript and especially for her expertise and interest in technological devices used in nursing, which made me curious enough to ask the questions which formed the basis of the research;

Anita Lange: Head School of Nursing: City East campus, University of Sth Australia, Jill Hilbig, Veronica Broughton, Gill Bricher, Merri Paech, Louise Tunbridge and colleagues for their interest and support;

My family, for their unending support..

Abstract

The purpose of this thesis is to determine how women felt about and learnt to use technological devices in an undergraduate nursing program. The way masculinity and femininity were understood and practised within families and the portrayal of conventional gender roles of women and men by the media are examined to determine social constructions which have influenced the women's perceptions of technology. Further, the study explored women's experiences when learning to acquire and apply knowledge of technological devices in order to identify factors which facilitated, influenced or inhibited that learning. In addition, women's perceptions of nursing, and the value of technological device use in nursing care were examined. The research focusses on the impact that each of these interrelated concepts have on women's learning.

Eight women from a cohort of graduating students from a South Australian School of Nursing, situated within a large multi-campus Faculty of Nursing were interviewed. Selection in the research was determined by a random sampling technique. A qualitative Feminist Interviewing Technique with Constant Comparative Analysis of the data was utilised to determine the women's perceptions.

The women's perceptions of technology were influenced by their views of femininity and masculinity and affected their learning to use technological devices in the home. However, the women's ability and confidence in using technological devices in an undergraduate program was facilitated by the safe and supportive environment created within the nursing skills laboratory. Discovery or experimental learning in small groups with teachers acting as facilitators enhanced student's feelings of confidence and learning. Insufficient time to practice in the laboratory hindered students' learning. All women were nervous when first incorporating technological device use into the clinical nursing area and focussed on the device rather than the client because as student nurses their prime concern is to ensure client safety. The women believed that the more often they used technological devices in client care the more confident they became. And the women believed they became more client than device focused. The women identified the essential element of nursing as the nurse and the ability to provide skilled nursing care that would holistically meet the needs of the clients. Nursing care was seen as providing both physical and emotional care to clients.

The contemporary issues which affect the way in which women perceive technology and learn to use technological devices were identified through using a feminist perspective.. Strategies to facilitate women's learning were also determined and should be considered when planning curriculum and teaching strategies for undergraduate nursing programs.

Table of Contents

Declaration of Originality

Acknowledgements

Abstract

Chapter 1	Introduction	1
Chapter 2	The Literature	5
	Gender in general education literature 1960-1980	5
	Literature overview: general and nursing education 1980-1996	6
	Challenging the status quo	7
	Concepts of technology	9
	Technological devices	9
	Gendered technology	11
	Need for study	13
Chapter 3	Methodology	14
	Feminist influences	15
	My approach to the study	17
	Ethical parameter	18
	Recruitment	19
	Refocusing the study	20
	Developing the research tools	20
	Listening to the women's experiences	21
	Determining a feminist perspective from the stories	22
Chapter 4	Introducing the Women	24
	Kelly	24
	Rae	26
	Chin	27
	Jane	28
	Bev	30
	Leonie	32
	Julie	33
	Yu	34
	The Interviewee's	36
Chapter 5	Social Construction of Gender and Technology	37
	Family influences	37
	The influence of the media	40
	Influences of Secondary Schooling	41
	Notions of Technology	41

Chapter 6	The Women's Learning Experience	45
	How the women learnt	45
	Cognitive difference	47
	Stressors and how the women felt	49
	Teaching methods	51
	Creating the learning environment	53
	Empowerment	55
Chapter 7	Nursing and Technology	57
	The women's perceptions of nursing	57
	Technological device use in nursing care	59
	Effects of the socially constructed conventional role of the nurse on student nurses	62
Chapter 8	The Way Forward	65
	Implications from social constructions of gendering	65
	Importance of learning environment	66
	Empowerment through education	67
	Further study areas	69
	Limitations	70
Chapter 9	Conclusion	71
	Bibliography	73
	Appendices	92



Introduction

This chapter defines the inquiry into how student nurses feel about technological devices and learn to use them in an undergraduate nursing program. The purpose of the study and the interrelated and interacting concepts of gender, technology and nursing are outlined.

Chapter 1

Nurses are the primary users of technological devices in the provision of nursing care to clients. During the past thirty years there has been an increasing number of devices developed for use by nurses as an adjunct to the nursing care that they give to clients. Once, these devices were only encountered in specialist areas in Health Care Institutions, such as the Intensive Care Unit, but today are found in general acute care wards, Outpatient Departments and in clients homes. Therefore, nurses must acquire knowledge about technological devices, and be able to apply that knowledge when the device is incorporated into nursing care for the client.

In Australia, student nurses undertake a three year undergraduate nursing program, which when successfully completed, enables them to register as a Registered Nurse with the Nurses Registration Board in the state in which the program was conducted. During the undergraduate nursing program the students of nursing are introduced to learning experiences and opportunities which enable them to learn about device function and operation of technological devices. The learning experiences occur within both the University and the clinical nursing areas.

It is documented within the literature that nurses who are not adequately prepared (through educational processes) to use technological devices may fear the equipment thus increasing their anxiety and stress levels (McConnell & Murphy 1990). If the nurse is not proficient in technological device use and has been inadequately prepared to interact with the technology devices and the client, then compromised client safety may result (McConnell 1990; McConnell & Nissen 1993; Cohen & Davis 1993). The nurse will be so concerned with the technological device function that they are not able to interact with the client in an effective manner, and may not interpret the data provided by the device appropriately. The technological device must not drive the nursing care but be an integral part of that care with the client the primary focus. Also outlined in Australian research on Registered Nurses is the belief that nurses have become deskilled because technological devices have replaced some of the nurse's manual

skills. Furthermore, the nurses believed that there was a danger with technological device use that they would become more focussed on the technological devices than the client (McConnell & Nissen 1993).

Technological devices are defined by Fay (1983:13) as being:

" an instrument, apparatus, implement, machine, contrivance, implant or in vitro reagent, including any component part or accessory which is intended for use in the diagnosis of disease, or in the cure, mitigation, treatment or prevention of disease, or to affect the structure or any function of the body of man or animals, which does not create its effect chemically or by being metabolized"

and are part of technology which is described by The United States of America's Federal Office of Technology Assessment as '... drugs, devices and procedures used in health care, as well as the organisational and support systems within which such care is delivered.' cited in Pillar, Jacox & Redman (1990:16). In this study I have used these definitions developed by western society as the framework for defining technological devices and technology.

In addition, in western society technology is regarded as a masculine culture. Socially constructed conventional gender roles portray males as users of technology and as being technically competent. This technical knowledge and ability to use technology gives to those who use it a degree of power (Cockburn 1988; Wajcman 1991 and 1994). Therefore, technological skills are defined as male property and are both a cause and effect of male supremacy. Women, although users of technology, are not valued for either their ability to use technology or the contribution they have made to its development, and in history they are absent from the texts. However, there is nothing inherently different in the way women and men use technology; the difference is constructed and developed in social processes over time in conjunction with hierarchical systems of power.

The postmodern Feminist viewpoint subscribes to the belief that gender differences in western society are socio-culturally constructed through language, by families, educational institutions and through work practices in the work-place and home. Gender refers, to the meaning of being either a women or a man and includes the psychological perceptions of femininity and masculinity in the given context of work. Ideas of femininity and masculinity are constructed in relation to each other, in part through work practices which facilitate and/or maintain power to one gender over the other in the workplace. The gendering of work practices refers to the allocation of work on the basis of sex within both the home and the workplace. This allocation of work practices operates through binary oppositions which are referred to as

male/female. These concepts are significant, and maintain in part the dominant ideology of culturally appropriate ideas of femininity and masculinity (Game & Pringle 1983).

The gendering of women and men into masculine and feminine beings is a cultural process of power which also extends to occupations. Nursing is regarded as a feminine occupation because it is a predominantly female profession with women being ninety percent of the work force (Speedy 1991). In western society caring and emotional labour which is regarded as a women's natural ability is not valued or acknowledged and therefore, is also rendered of little consequence. As a result the social constructions of conventional gendered roles maintain, in part, women's subordination and oppression in society through hierarchical systems of power.

The portrayal of conventional gender roles by both educational Institutions and media, in part, contribute to maintaining difference between women and men. Women are disadvantaged by the nature of education received and by the choice of subjects that is offered to them which are often not technically or scientifically oriented (Earley 1985; Chivers 1987; Byrne 1984 and 1993). In addition, Byrne (1993) contends that 'the problem with girls and women, is boys and men', and this critically affects the learning environment of girls and women. The learning environment must change from a male dominated co-educational environment to a 'sex neutral' classroom (Byrne 1985).

Therefore, how undergraduate nursing students are introduced to technology, is of particular importance. In order for appropriate educational programs to be developed which allow undergraduate nursing students to complete the program successfully with a high level of confidence, expertise and competence in technological device use, it is necessary to examine two inter-related and inter-acting factors. First, the way in which femininity and masculinity are understood and practised by the student nurses' families and second, how the portrayal of conventional gender roles by educational institutions and the media determine social constructions influence student nurses' perceptions of technology. The perceptions that these students bring about technology has the potential to influence the way they feel about and learn technological device use in an undergraduate nursing program.

To date, there has been no Australian research involving undergraduate nursing students and how they feel about and learn to use technological devices in an undergraduate nursing program. Nor have there been studies to ascertain nurses' perceptions of the social construction of conventional gender roles which influence perceptions about technology. Also other factors which facilitate or hinder the

acquisition and application of knowledge related to technological device use have not been identified. Neither are there studies which analyse whether the educational process of preceding school years and socio-cultural factors influence the way in which nurses feel, learn and interact with technological devices.

Therefore, the following questions will guide this study.

1. What are the socio-cultural factors that influence, facilitate and/or hinder student nurses when learning to use technological devices both at home and in an undergraduate nursing program?
2. What do the terms technology and technological devices mean to student nurses ?
3. How do student nurses feel about technological devices and learn about their function and use in an undergraduate nursing program?
4. How do student nurses perceive nursing and the value of technological device use in nursing care?

Importantly, this study will examine how student nurses' feel about and learn to use technological devices. It will allow the nurses' perceptions of nursing and the value of technological device use in nursing care to be explored. Furthermore, student nurses' perceptions of femininity and masculinity as understood and practised within the student nurses' families and the portrayal of conventional gender roles by educational institutions and the media will be examined to determine social constructions which influence the women's perceptions of technology.

Literature Review

The literature which supports and surrounds this study is reviewed. A circular approach is taken to 'concept map' the field of study. Literature which discusses the construction of gender in education, the impact of feminism on nursing, definitions of technology, technological devices and gendering of technology are discussed and finally the need for the study is explained.

Chapter 2

The focus of this study is how the student of nursing feels about and learns to use technological devices in and undergraduate nursing program. Therefore, published literature which pertained to the study was selected from the fields of Womens' Studies, Nursing and Education, in order to identify the concepts relating to gender and technology. Philosophical, psychological, procedural and knowledge based articles which either described research or presented contemporary debates on the topic were reviewed. 1960 was chosen as the starting point for the literature review because it was at that time that technological devices were rapidly increasing for use by nurses as adjuncts to nursing care. It was also the time when the second wave of the feminist movement was beginning to gain momentum.

Gender in general education literature 1960-1980

Some of the educational literature from the 1960-1980's was scanned to determine the literature's discourse explaining the education of girls and boys, women and men. This revealed how the conventional gender roles relating to learning for girls and boys were portrayed at the time of the nursing students' birth. The majority of the philosophy and psychology based literature on learning/education between 1960's and 1970's which I reviewed, was written by men. In most of the texts words like children or students were used to explain the concepts of education including teaching and learning strategies. The exception occurred when the author was explaining learning differences between girls and boys. In these chapters girls were named, as were their attributes and skills relating to language and skills. Boys were mentioned for their mathematical and mechanical abilities. Also the behaviourist model of education was detailed (Curtis & Boulwood 1961; Lindgren 1962; Wilson 1963; Butts 1964; Ausubel 1968; Dreikurs 1968; Connell 1974; Moore 1974; Kelly 1977). In addition, theories of learning, characteristics of learners, teaching strategies and classroom behaviour management

procedures are outlined. The belief that for learning to be effective, the learner must be actively involved was a continued theme in all general education literature of that period (Curtis & Boulwood 1961; Lindgren 1962; Dewey 1963; Butts 1964; Stones 1966; Ausubel 1968).

The authors, Lindgren (1962) Ausubel (1968) Driekers (1968) and Connell (1974) all asserted that girls have better interpersonal and communication skills, including vocabulary and verbal fluency, than do boys. Boys surpass them in arithmetical skills related to spatial, numerical and mechanical ability. Further, Lindgren (1962) and Ausubel (1968) assert that socio-cultural factors influence learning abilities and that there are no differences in learning abilities between boys and girls until the age of five years. In addition, Lindgren and Ausubel contend that behaviour, social expectations and class background are influencing factors, which schools and teachers perpetuate through class room behaviour expectations. Educational institutions reinforce the conventional gender role behaviour of the feminine patterns of conformity and submission as expectations and norms for classroom behaviour. Furthermore Ausubel (1962) asserts that the incidence of intellectual superiority is indisputably higher among males than among females and differential conditions of cultural expectations, motivation, and opportunity and cannot be ignored.

Butts (1964) an American teacher in a report on the Australian education system asserts that the Australian culture is a man's world and that the educational system is one which will enhance boys' intellectual potential rather than meet girls' educational needs. In addition, Butts asserts that in Australia there is a hierarchy within the science subjects and girls are discouraged from taking pure science subjects such as maths and physics and chemistry and encouraged to study subjects which are applied sciences such as physiology.

Literature overview: general and nursing education 1980-1996

From 1980 both authorship by women and men was evidenced in the educational literature. There was a change in focus too, text represent both behaviourist and humanistic models of education. Some authors used feminist ideologies in their texts (Byrne 1984, 1988 & 1993; Earley 1985; Towns 1985; Chiver 1987; Delpit 1988; & 1992; Eckert 1989; Weiler 1989; Schumacher & Gortner 1992, Nichols 1995). In a sample of nursing education literature from 1960 -1975 the majority of the authors were women. Also, it was not until after 1980 that there was an increase in published

nursing literature which reflected the influence of feminism. During the past decade the published nurse literature influenced by Feminism has continued to increase.

There is an abundance of nursing literature written during this period. There is a variety of research, philosophical and knowledge/procedural publications which explore the pertinent areas which influence and underpin the study. Not all of the authors are nurses, some authors are from the social science field, but all have an interest in both the role of the nurse and nursing. Since 1990, some authors have urged nurses to consider the important contribution that feminism offers to nursing. The contributions to be considered include curriculum design and teaching strategies and viewpoints which challenge nurses to explore the social constructions of western society which in part, maintain nurses subordination and oppression in the health care industry.

Challenging the status quo

It is generally acknowledged that nurses have been slow to embrace Feminist ideologies. Feminist theories offer to nurses a way of understanding nursing practice and the hierarchical systems of power which confine nurses' practice (Vidovich 1990; Lumby 1991 & 1993). Literature describing teaching strategies which are based on feminist principles or acknowledge Blenky et al's (1986) 'women's ways of knowing' a five stage process leading to 'connected knowing' and empowerment for women as bases for classroom practices are now emerging in the literature (Ruffing-Rahal 1992; Schuster 1993; Boughn & Wang 1994). Other nursing authors value specific aspects of learning such as identifying that nurses use patterns of knowing such as cognitive critical thinking (Bevis 1988; Tanner 1993), intuition (Benner 1984) and the experiential pattern of knowing (Benner 1984; Jenks 1993). Views of cognitive differences and the effect on women's and men's ability to learn are depicted in the literature (Byrne 1984; 1988; 1993; Golonka 1986; Seidl & Sauter 1990; Bent 1993; Heinrich & Witt 1993). However, opposing views are held by Golonka (1986) and Byrne(1993). Golonka's view reflects the view in the published literature in the 1960's, while Byrne asserts that the belief of cognitive difference is based on assumptions, which has created a myth. This belief has been socially constructed and is, in part, maintained through hierarchical systems of power.

The research published by Blenky, Clinchy, Goldberg & Tarule (1986) has been an influential piece of writing for Feminists. The concept of the construction of women and their five stages of knowing, (silence, received knowledge, subjective and procedural knowledge and optimally constructed knowledge) is referred to and quoted

by feminist nurse authors such as Bent, 1990; Campbell & Bunting 1991; Ruffing-Rahal, 1992; Thomas, 1992; Heinrich & Witt, 1993; and Gray, 1995. While nurses have acknowledged this piece of research and are using it to base some of their classroom practices, Reinharz (1993) questions the validity of the research.

Some authors who are influenced by the post-modern Feminist viewpoint argue that women's voice have not been recorded in history, therefore women have been silenced and as a consequence are devalued and invisible. Emotional labour as defined by James (1989 & 1992) ascribes an importance to studies that explore, acknowledge and value emotional expression and emotional care. Emotional work, and emotional care, is seen in a patriarchal world as a secondary role and a 'natural' talent of women, and as such it is integrated into the workforce through women's paid employment. The lack of acknowledgement of emotion management in the workplace, except for example, in the management of a client and their family when there is an impending death of the client, ensures it is devalued and unrewarded. It is however, a part of nurses' work (Small 1996). As a result the social constructions of conventional gendered roles maintain, in part, women's subordination and oppression in society through hierarchical systems of power.

The historical links that the nursing profession has had with the army and religion have impacted on nursing practice also and contribute to nurses feelings of powerlessness. (Street 1992; Bent 1993). However, nurses are questioning and challenging the status quo of nursing. The nurses are exploring their beliefs on power and control, particularly as it relates to nursing practice and the nurse's position within the health care world (Chinn 1985; Colliere 1986; Melia 1987; Lumby 1991; Street 1990 & 91; Sohler 1992; Pellieter 1993; Bent 1993). Further, DeLuca (1995) urges nurses to consider the historical aspects of nursing which have embedded rituals within nursing practice. These rituals can be viewed as 'received knowledge' and become taken-for-granted as sacred rites. The practice of these rituals has the potential to interfere with nursing students' decision making processes. As the students' confidence grows through education and acquisition and application of nursing knowledge they may view nursing practice differently to the other nurses on the wards who have adopted ritualistic ways of practice. Hence, student nurses may face conflict in their desire to practise and/or challenge traditional work culture and practices. This, Bent (1993) believes, results in some nurses lack of self esteem and feelings of inferiority. Feminist theory offers to nurses an explanation for these feelings and the means to revalue themselves and their profession as well as ways to challenge existing work practices.

Concepts of technology

Technology in health care institutions has increased rapidly. Often, nurses in providing care to clients, use and/or monitor pieces of technology known as technological devices. The use of technological devices as an adjunct to nursing care of a client is becoming increasingly more common. In the past thirty years, client care devices such as mechanical lifters, manual and automatic blood pressure measuring devices, cardiac monitors, intravenous pumps, pulse oximeters, glucometers, respiratory ventilators, renal dialysing units, etc. have been introduced. The complexity of nursing work increases for the nurse when a client has multiple client care devices in use at the same time.

Contained in the literature are many definitions of technology. The United States of America's Federal Office of Technology Assessment as '... drugs, devices and procedures used in health care, as well as the organisational and support systems within which such care is delivered.' cited in Pillar, Jacox and Redman (1990:16) is the definition most commonly used within the nursing. However other attributes which are most commonly ascribed to the term technology encompass concepts like 'machinery' 'equipment' 'pharmaceuticals' and 'procedures' (Bush 1981; Brewer 1983; Byrne 1993; Wajcman 1994). Technological devices are seldom defined in the literature however this definition depicts the commonalities of most descriptions of technology. Technological devices which are part of technology are defined by Fay (1983:13) as being: "an instrument, apparatus, implement, machine, ... for use in the diagnosis of disease, or in the cure, mitigation, treatment or prevention of disease ...". This view of technology is a scientific viewpoint, however, also contained in the literature are philosophical viewpoints on technology. (Bush 1981; Rothschild 1981; McGaw 1982; Cockburn 1983, 1988 & 1992; Linn 1987; Hines 1991; Sandelowski 1993; Waters 1995).

Technological devices

The literature articles clearly define the need for nurses to become proficient users of technological devices through educational programmes. (Marles 1988; Pickhaver 1985; Jacox, Pillar & Redman 1990; McConnell 1990; McConnell & Murphy 1990; Pillar Jacox & Redman 1990; Pillar & Jacox 1991; Pelletier 1995). Nurses who are not adequately prepared through educational processes to use these technological devices may fear the equipment thus increasing their anxiety and stress levels (McConnell &

Murphy 1990). If the nurse is not proficient in technological device use and has been inadequately prepared to interact with the devices and the client, then compromised client safety may result (McConnell 1990; McConnell & Nissen 1993; Cohen & Davis 1993). The nurse will be so concerned with the device function that she/he may not be able to interact with the client in an effective manner, and may not interpret the data and function of the device appropriately.

Ethical implications of technological devices use for nurses were identified. The issues were quality of care, 'do not resuscitate' orders, euthanasia and decision making issues for nurses who are caring for clients with technological devices. The depth of the issues ranged from concerns about invasion of privacy, the use of the data collected through invasive technological devices, to the discontinuing of life support technology. In all of the ethical dilemmas the nurse can face a situation where her personal beliefs are in conflict with the clients, the client's family or the law. The ethical dimensions for nurse's and their impact and effect on nurses' work, and interaction with clients and devices is worthy of further exploration (O'Neil 1991; Penney 1991; Grant 1993).

Not only will the proliferation of technological devices exacerbate the ethical dilemmas for the nurse, it will also increase the complexity of decision making processes which she will need to make. Many technological devices provide a means to collect data on which a client's condition and subsequent nursing and or medical interventions will be based. There are usually several different options that can be taken in the decision making process, and often the correct option must be identified quickly because it may be a matter of life and death if the wrong option is chosen. This situation requires the nurse to be able to make accurate decisions quickly, therefore critical thinking is an essential attribute for the nurse.

Only two articles in the literature review (McConnell 1995; Penney 1991) discussed cultural implications for clients from culturally diverse groups with reference to technological device use and nursing care. This is an area for further exploration. The issue of the needs of culturally diverse groups is largely absent from the literature with the resulting effect that these groups of people are invisible and therefore rendered invisible and of no consequence to nursing.

Articles pertaining to 'technology of work' were identified. Medcof & Wall (1990:52) use the term technology to describe the work that the "worker does, with or without tools". This article explores the motivation and work satisfaction profiles of nurses comparing different work sites within health care institutions in an effort to understand productivity issues of nurse workers, causes for absenteeism and staff resignations in

nursing staff. These issues are of particular interest for economic planners and the management of health care institutions. The authors are male, with degrees in Business Administration and Health Economics. The study used an empirical positivist model, and trivialises nurses' work by categorising work into routine and non routine work.

The aim of the Medcof and Wall's study was to show that different motivation factors influenced the satisfaction of nurses working on different units. The study hypothesizes that a hierarchy of units, with complex specialist units like Intensive Care the most complex, to medical units the least complex, would show that there would be a difference in nurse satisfaction between the units. Further, different motive profiles, satisfaction and need for power would be tied to the hierarchy of complexity of work. This was not proved. The study did not make visible the work of nurses or the complexities of the decision making process. Thus the complexities of nurses' work was absent and invisible in the study, which rendered the majority of nurses' work as irrelevant.

Larrivee & Joseph (1992:279) assert that although there is 'more technological help to assist the nurse, the actual time allotment for decision making has not increased.' Nurses need to consider much more data in a the same period of time. This article also highlights the technique related errors which can occur through either nurse operator error, incorrect interpretation of assessment information or device malfunction. The potential for error occurs whenever technological devices are used on clients to collect assessment information. Hansen (1993); Manning, Broughton,& Mc Connell (1995) Watson 1986, explore the use of Nursing Skills Laboratories and reality based scenarios as a suitable teaching methodology to assist in the critical thinking/clinical judgement development of student nurses. This literature focuses on the decision making processes but does not consider how or what nurses learn about technological devices, nor how women feel about using technology, nor how it is incorporated into the provision of client-centred nursing care.

Gendered technology

Gender and technology and embodied in social constructions of a western society and technology is gendered to be 'masculine', just as nursing is gendered by society to be 'feminine'. While much of the Feminist discourse centred on technology is confined to technology in the home, it is possible to transfer these concepts to the nurses

workplace. (Bush 1981; Rothschild 1981; McGaw 1982; Cockburn 1983, 1988, 1992; Linn 1987; Hines 1991).

Bush (1983) and Rothschild (1983) each present the feminist view of technology, describing technologies impact and effect on women's work which is relevant and important. The definitions of 'tools', 'techniques' and 'technology' clearly define and distinguish the meaning of words which are often used interchangeably when discussing technology. The importance of language and its use to maintain social control and power are central to Bush and Rothschild's critique which emphasises the need to 'unthink the power dynamics of technological decision making' (Bush 1983:256). Women are urged to listen, to understand then challenge the language used when giving social messages and social learning examples to children. If the language used in giving these messages about social learning to children was altered, the effect might be a change in the conventional gender role portrayal that occurs at present. The ultimate result might be a reduction in patriarchal power and control in western society. Another important concept identified in the article is the notion that power is often, through language, given to the technology rather than the user of the technology. Socially constructed conventional gender roles portray men as users of technology and as being technically competent. This knowledge, skill and ability to use technology gives to those who use it a degree of power (Cockburn 1988; Wajcman 1991 and 1994). Therefore, the technological skills are defined as male property.

Substantial literature has been written on women and employment, especially in the non traditional employment areas for women. Women are under-represented in the employment arena which require technological skill and scientific knowledge. These employment areas are valued by western society. Pocock 1988; Hagell 1989; Hickson 1990 assert that educational and equal opportunity policies have had little effect for women but have been effective in encouraging men to seek employment into areas where a high percentage of are women employed. Other authors outline the social constructions which have maintained women's oppression in western society (Greenleaf 1980; Wallisgrove 1980; Game & Pringle 1983; Byrne 1984, 1985 & 1993, Cockburn 1988 & 1992; Harding 1994; Mason & Talbot 1985; Gaze & Cottingham 1987; Kalisch & Kalisch 1987; Short & Sharman 1987; Pocock 1988; Hagell 1989; Hardie 1989; Wajcman 1991 & 1993; Hickson 1992, Ryan & Porter 1993; Women in Science, Engineering and Technology Advisory 1995. Much of this literature will be pivotal in exploring the way femininity and masculinity is understood and practised with in families and how the portrayal of conventional gender roles of women and men by educational institutions and the media influence perceptions of technology in student modes of participation in learning activities.

Need for study

No research was found in the literature that provided evidence that this field of study on how student nurses felt about and learnt technological device use in an undergraduate nursing program had previously occurred. No research has explored, for either undergraduate nursing students or Registered Nurses how the social constructions of conventional gender roles as portrayed in the home or work place influence their perceptions of technology and no studies have sought to identify the way in which nurses understanding of femininity or masculinity influenced their perceptions of technology.

Technology has changed the practice of nursing, and it will continue to do so. The literature review confirms the necessity for the study, in order to develop educational programs which will adequately prepare student nurses who are able to proficiently manage technological devices when providing nursing care to clients. The literature review suggests that there are implications for teachers of nursing students in undergraduate nursing programs and for students in the way in which they are introduced to technological devices. The literature review highlights the importance of student nurses being proficient with device use in order to provide safe nursing care to clients.

Methodology

This chapter outlines the methodology used to collect the data on which the later chapters are based.

Chapter 3

As evidenced in the literature review the experiences and feelings of women learning to use technological devices both in an undergraduate nursing program and in their everyday lives have not been recorded. This absence of women's experiences in the literary discourse of nursing renders their learning experiences as unimportant and inconsequential. Therefore, this study was designed to explore feelings and experiences of women as they learn to use technological devices in an undergraduate nursing program. It provided these women with the opportunity to reflect on and describe their experiences when learning to use technological devices in a tertiary nursing education program. Their reflection and description enabled the researcher to make meaning of those experiences. This exploration also facilitated the identification of some of the socio-cultural factors which have influenced these women's world view about learning and using technological devices.

This exploration of women's feelings and learning experiences required a qualitative research approach. Such an approach provides the researcher with the opportunity to explore the women's views of reality and allows any similarities and differences between their experiences to be identified (Reinharz 1992). A qualitative approach also offers the researcher the opportunity to hear the women's stories in their own words and to give their experiences a voice.

Qualitative methodologies differ from quantitative methodologies in that they demand more rigour on the part of the researcher to ensure validity (Knafl & Webster 1988; Hall & Stevens 1991). Therefore, the researcher and the interviewees are engaged in a more intense, prolonged contact than when a quantitative approach is utilised. This interaction between the researcher and the interviewees should be a 'subjective, personal, experiential and non-hierarchical' experience (Keddy 1992:8) that values the emotional dimension of the women's experiences.

Feminist influences

As a feminist, I believe that women's voices must be heard. My view of feminism is based on the following three tenets: 1. women are oppressed; 2. in every personal experience there is a political reality; 3. through the process of consciousness-raising women will view their worlds differently (Speedy 1991; Cheek & Rudge 1994). Furthermore, I believe that women's experiences are important and an understanding of the phenomena of everyday life is essential if one is to understand women's positions in the world.

My underpinning belief is that language constructs the position of women in western society. Lather (1986) and Weedon (1987) support the poststructuralist view that language is the common factor for analysis of, and the means to make sense of social meanings, power and the individual consciousness and constructs women's (and man's) subjectivity. Similarly Scott (1990:135) asserts that language is a term which embodies words, vocabulary, grammar and meaning and is a system 'through which meaning is constructed and cultural practices organised.' Therefore, in this context, language is the beginning point for understanding how each participant views herself and her world and allows 'new interpretive possibilities' to be drawn from the interview and collected data by the researcher.

Weiler (1989: 58) contends that studying women is the starting point for insights into 'the relationship of power, knowledge and language ... Women know themselves through the male hegemonic vision of reality ...'. She asserts that women exist within the tension of being subjects and being denied as subjects and therefore are rendered invisible in both research and society. Gender relations and gender identity are shaped within the workplace (Game & Pringle 1983). Gender relations are defined by power and involves the subordination of one gender to another. In a patriarchal society women are subordinate to and dominated by men. Gender identity is the construction of women's and men's identity as sexual human beings. Ideas of femininity and masculinity are constructed in relation to each other, in part, through work practices which facilitate and/or maintain power to one gender over the other in the workplace. The differences of women's work and men's work does not rely on the quality or type of work but on the construction of meaning given to it and that this meaning is constructed by both women and men (Game & Pringle 1983).

Game and Pringle's view has assisted me as the researcher to make sense of the nursing world. I am a woman who has been a student of nursing and I now work as a Registered Nurse in a socially constructed world of gender difference. I have lived

most of my life unaware of the feminist movement and the meaning of feminism for women. I have been embedded in a patriarchal world and I did not recognise that Nursing as a profession had been constructed and developed within the ideology and tension of male dominance and oppression which resulted in the nurse's role being seen by society as one of subordination (Vidovich 1990). Thus the subjectivity of the researcher and inability to achieve complete objectivity is acknowledged.

In Feminist enquiry the research relationship between the researcher and the participants is important. The personal experiences and values of the researcher are important. Often feminist researchers begin an interview with a research question linked to their own lives because the life experiences which can be shared enhance the relationship and advance the knowledge about women for women. The sharing of experiences generate trust and fosters communication and women are encouraged to ask questions of the researcher so that the research is shared (Reinharz 1992). Therefore it is important in this study to value the subjective experiences of the women who are to be interviewed and seek ways to understand the meaning of their experience in order to make visible the women's learning experiences within a student nurse's world.

In this study I wish to value of the subjective experiences of the women and this is reflected in my choice of methodology. A feminist researcher must ensure that research is based upon feminist principles and choose research methods which 'expand and develop inductive theoretical underpinnings of research which are free from androcentric biases' (King 1994). Therefore, I chose a methodology that promoted interaction between myself and the women because all participants should mutually benefit from research (Lather 1988). Thus the research is for women, rather than on women and assists them to understand their experiences and lives (Speedy 1991; King 1994).

My beliefs also concur with Weiler (1989) who asserts that feminist methodology has three major themes. One, feminist research begins with a vision of woman in a male defined society and intellectual tradition. Two, feminist research emphasises the lived experience of everyday life and is given this emphasis through, a) the assertion that the personal is political, b) an interest in phenomena of social interactionist approaches, and c) by recognising the relationship between the woman researcher and the woman participant. Three, the research must be politically committed to changing woman's position in the world. The qualitative research approach that guided this study follows this feminist methodology and epistemology.

My approach to the study

I utilised a Feminist interviewing method (Reinharz 1992) which required a semi-structured interview guide to collect the data. The data was subsequently analysed using a constant comparative analysis, an inductive, interpretive research technique. Women, including nurse researchers, use a Feminist interviewing method and a constant comparative analysis technique because it allows them to collect data without using a pre-existing theory as an organising framework. The researcher continually analyses the data against each piece of data collected for similarities and differences. The literature too, is searched for similarities and differences. The themes are then identified. The research method utilises the knowledge of the researcher and acknowledges that the research will use this knowledge to uncover themes (King 1994; Baker 1992). However, the researcher must always keep an open mind about what themes will be found within the collected data.

Strauss & Corbin (1990) also identify that the creativity of the researcher is an important element of qualitative research because it is the researcher's ability to generate questions and comparisons from within the data that will lead to discovery of themes. These attributes were required for both the researcher and research method because no research on this topic was found in the reviewed literature. Hence there was no literature which described the feelings and experiences of women when learning to use technological devices in an undergraduate nursing program or in their everyday lives to influence my study. Therefore this study was designed to capture the learning experiences and perceptions of nursing students who had completed an undergraduate nursing program.

The use of a Feminist interviewing method with a constant comparative analysis technique differs from empirical positivist research which begins with a theory and then sets about to prove that theory (Strauss & Corbin 1990). This type of research is also different from grounded theory, ethnography and phenomenological approaches (Reinharz 1992; Baker et al 1992; King 1994; Strauss & Corbin 1990). Grounded theory is an inductive research technique developed by Glaser and Strauss in the 1960's. It has been used by nurse researchers to collect data without using a pre-existing theory as an organising framework. While recognising that the researcher has knowledge and will use this knowledge to uncover themes, it is important for the researcher to be continually analysing the data against every other piece of data as it is collected for similarities and differences. Included in this process are the themes identified from within the literature. All the data are coded and categorised from which concepts and constructs are formed. The purpose is to build a theory which enables

the area being studied to be understood and if substantiated, will be able to be used to understand or identify the same phenomena in a different set of circumstances. In this method, researchers search for relationships between concepts whereas in the qualitative method of constant comparative analysis researchers generate themes but are unable to uncover patterns and links between categories or develop theories (Patton 1990; Holloway & Wheeler 1996).

Ethnography usually involves extensive field work in which the researcher engages in a variety of data collection techniques such as observation, interviewing, participation and archival analysis. However its primary method of data collection is from participant observation. In the analysis phase of the method the researcher focuses on the interpretation of the collected data. The aim is to determine the social and cultural meaning of the situation or context and apply the findings from a cultural perspective in other situations or contexts. This method can identify concepts and generate new theories (Patton 1990; Reinharz 1992).

Phenomenological inquiry focuses on the structure and essence of an experience of a phenomena for a group of people. The phenomenological study focusses on what people experience and how they interpret the world. The data can be collected either by participant observation or by interview. The experiences of the different people are then analysed and compared to identify the essences of the phenomena (Patton 1990).

Ethical parameters

Ethical issues were considered throughout all stages of the project. Written permission was sought and gained from the Dean: Faculty of Nursing; Director: Faculty's Research Centre and the Head: School of Nursing of the intended site for recruitment of the prospective participants. The letter 'Invitation to Participate in a Research Project' which described details of the project's conduct including protocols for maintaining privacy and confidentiality, and possible locations for the interview (Appendix 1), the 'Reply Form', and the 'Project Consent' form (Appendix 2) were developed and accompanied the request to conduct this study. These documents accompanied this request for permission to conduct the study. This process occurred prior to submitting and gaining the ethics proposal to the relevant ethic committees of both the Women's Studies Department, University of Adelaide and at the proposed site of the study. In accordance with the requirements of these committees the signed consent forms and tapes are lodged with the Department of Women's Studies, University of Adelaide in a sealed envelope.

Another important consideration was that of dependency of the participants to the researcher who is employed as a lecturer at the School of Nursing from where the participants were to be recruited. One of the criteria which was established for the selection of the potential participants in the study was the successful completion of their undergraduate nursing program. Therefore, the participants were no longer in a dependent position. It is important that if information is to be freely given which might be sensitive in nature that the interviewee/researcher does not have the power to disadvantage that person in any way (Mies 1983; Gorelick 1991; King 1994).

Recruitment

The potential participants were drawn from a cohort of one hundred and forty-six graduating students from a South Australian School of Nursing, situated within, a large multi-campus Faculty of Nursing. A random sampling technique was used to identify the participants who would be invited by letter to participate in the study. To ensure confidentiality the Administrative Officer of the School of Nursing was approached and subsequently agreed to select the participants using a selected random sampling technique. The criteria which guided the selection process was established and she identified every fifth student who had successfully completed the Bachelor of Nursing in December of the year preceding the study.

In total, thirty participants were chosen. The potential participant sample did reflect the cohort's gender ratio of females to males, in that the number of female and male graduates selected represented the percentage ratio of female to male students who had successfully completed the course.

Eight women responded to the initial invitation. Of these, one woman declined the invitation and no replies were received from the invited male participants. A second letter (Appendix 3) was then sent to those graduates who had not responded to the first contact letter. This resulted in one further reply from a woman graduate. Therefore from the thirty potential participants who were invited to reply, eight affirmative replies were received from women and subsequently these formed the sample on which this study is based.

Refocussing the study

Initially the research focus of this study was centred on a potential sample of nurses which contained representation from both women and men so that similarities and differences between the genders might be identified. Due to the women only response to the invitation to participate in this study, the research focus was sharpened, to centre the study on women's feelings and experiences when they learnt to use technological devices in an undergraduate nursing program.

The questions were redefined to be:

1. What are the socio-cultural factors that influence, facilitate and/or hinder women when learning to use technological devices both at home and in an undergraduate nursing program?
2. What do the terms technology and technological devices mean to women who are nurses?
3. How do women feel about technological devices and learn about their function and use in an undergraduate nursing program?
4. How do women perceive nursing and the value of technological device use in nursing?

Developing the research tools

I believed that a semi-structured interview guide (Appendix 4) with open ended questions would best facilitate the interview process and allow the research questions to be answered. In order to develop the questions for this study literature was examined for possible themes. Literature related to nursing, gender and technology was searched for potential themes. Themes, once identified, were then analysed and used to design open ended questions. These designed questions would allow the women to reflect on and describe their feelings and experiences when learning to use technological devices in the context of women in an undergraduate nursing program and their everyday lives. The initial interview guide contained questions relating to six areas addressed within the literature such as the nature of technology and devices, learning styles and women's ways of knowing, role of technology in nurses work and the social construction of gender. The evidence provided in the women's answers would either substantiate or provide alternative views to the identified themes contained in the reviewed literature.

In order to increase the richness of the data which was being provided by the women each woman's transcribed response was compared and analysed using a constant comparative analysis technique. Burns & Grove (1987) emphasise that this process of

comparing the data with that found in the literature throughout the data collection period is an important element of this research technique. The technique requires the comparison of each woman's response with the themes contained in the literature and with each of the other participant's response in conjunction with the open-ended questions in the interview guide. The interview guide was altered after the first (pilot) interview when two questions were identified as needing refinement.

Listening to the women's experiences

Each participant was sent a letter inviting them to participate in the study. The invitation outlined the purpose of the study, details of the gender representation of the sample, the negotiable arrangements for the interview venue, including the anticipated length of the interview, the procedures which would occur to ensure their anonymity, other ethical considerations including the storage of consent forms and data and the process which ensured confidentiality would be maintained when tapes were being transcribed. A reply form and an addressed reply paid envelope were also included with the letter and reply form was enclosed.

After each woman's 'Reply Form' was received I made contact by telephone. The initial contact between each woman and myself was used to establish rapport and negotiate an appointment time and venue to suit each participant. This rapport was further developed prior to beginning the interview. All interviews occurred in an office at the School of Nursing. In the office the seats were arranged so that it facilitated the interview process and allowed the researcher and the interviewee to maintain rapport, have eye contact and hear clearly. I was able to maintain rapport with each woman and communicate an understanding of their world because I am a Registered Nurse and as a Lecturer and co-ordinator of the Nursing Skills Laboratory have facilitated each woman's development of nursing knowledge and clinical applications of nursing skills during the program. Minchiello (1990) asserts that rapport is established when the researcher communicates an understanding of the interviewee's world. With rapport established the researcher is then able through the use of open-ended semi-structured questions address the how, what and when of the experience. The researcher must listen attentively in order to obtain the story and to guide the interview in a manner which ensures that the interview progresses smoothly and productively.

Prior to the commencement of the interview the purpose of the study was explained. All considerations relating to voluntary participation, the right to withdraw from the study at anytime within the data collection period, the means to ensure confidentiality

and anonymity and storage of data were clearly stated. Each woman was informed that the interview would be taped, then transcribed. The opportunity to read and review the transcript was offered to each woman but each refused. Once voluntary participation in the project was established each woman was assigned a pseudonym which was used throughout the study. Then the project consent form was signed and the interview commenced.

A total of eight women were interviewed over an eight week period. A qualitative approach was used to collect the data, and in order to place the study in context, minimal demographic data was obtained from the participants at the time of the interview. Each interview varied in length from thirty to sixty minutes, and were unique and free flowing in style yet guided by the interview guide. In the interview phase of this study, an emphasis was placed on the interaction between the researcher and the interviewee in order that each woman felt comfortable about the interview process and had sufficient time to reflect on her feelings and to describe her experiences learning to use technological devices. When the interview was complete each woman was assured that a copy of the abstract would be sent to her once the project had been finalised and placed in the relevant libraries.

To record the interviews a small audio tape recorder was used. Prior to the arrival of each woman the unit's batteries were checked and a new audio recording tape inserted. Also I had practised talking, asking questions and replaying the tape to ensure that I was familiar with the equipment and eliminated bias from the way in which I asked questions. The recorder was then placed on a table in such a way as to record the interview yet not be intrusive or distracting to either party. At completion of the interview the tape was transcribed by secretarial staff of the School of Nursing. To ensure accuracy of the transcription I then listened to the tape and read the transcription.

Determining a feminist perspective from the stories

The analysis phase of any study is the most difficult time for a feminist researcher for it is the time when its very process fragments the data and a sense of the wholeness of the woman's response has the potential to be lost. The process that I used for this phase of the study was a continuous process which began at the time of the first interview and ended when the project was complete.

Once the interviewing phase was complete, I used a reductionist approach to determine similarities and differences between each transcribed text. These similarities and differences in the data were compared and analysed until themes emerged. The data themes were then reassembled into concepts which are reported in the following chapters in this thesis. Knafl & Webster (1988:196) assert that reductionist tasks relate to the management of data and then in the task of data analysis when meaning is extracted from a data set it is reconstructed into a 'thematic and conceptually relevant whole'.

In the analysis phase of the study the women's responses were grouped under headings guided by each question in the interview guide. Each woman's responses was then analysed for themes and grouped with other woman's responses of similar meaning in order to locate patterns of similarities and differences in their experiences. The identification of these patterns gave meaning to the women's feelings and experiences. Burns (1995) describes this process as coding. There are three types of codes, descriptive, interpretive and explanatory and all were used in analysing the data.

The reflexivity of the researcher is particularly important if women's stories and the meaning of that experience is to be understood. In the analysis phase my reflection on the transcripts and re listening to the original tape assisted in the uncovering of themes. Fonow & Cook (1991) cited in King (1994) assert that the feminist researcher must critically reflect and examine the research process in order to view women through a feminist perspective.

I taped the interviews in order to ensure that the women's experiences were valued. I believed that by taping them and then transcribing them I would increase my ability to reflect and critically examine each woman's experiences. Sandelowski (1994) warns that a transcript is a 'constructed reality' and requires the researcher to be alert and rigorous in all aspects of the process of transcription and analysis. In order to reduce data analysis error and not misrepresent talk, particular care is needed in tape transcription so that the meaning is not lost or changed and also in the selection of pieces of the interview will appear in the text. I have used the woman's words to convey meaning and to provide evidence on particular points in order to legitimise the study. To maintain a feminist perspective these patterns were then compared with the themes which had been identified in the literature, then women's responses were conceptually rebuilt as a whole and presented in the following chapter. In this way I have sought to foreground each woman's experience.

Introducing the women

This chapter introduces the eight women who participated in this study. Each woman's narrative, which I have constructed from the interview, provides a 'snapshot' of the woman's views at that moment in her life.

Chapter 4

Kelly

Kelly, aged twenty four, successfully completed year 12 at secondary school and entered the undergraduate nursing program at the commencement of the next academic year. She had no nursing experience prior to entering the program. She describes her preferred learning style as one which utilises the 'trial and error' or experimental approach. This style of learning was modelled by her family.

As a child learning to use technological devices, Kelly was most influenced by her father and elder sister. She explains that they were never scared of machines. Her father liked to explore the functions of the machine (technological device) without reading the instructions. Kelly says "I get that from him. I've never been scared to jump in and look at something, but I like to have a play on my own before I dive-in and have them see me use it. ... If I don't understand I go to the manuals." As a result of these life's experiences Kelly is not frightened of technology and says "I was never afraid to use electrical or mechanical things as a child and I am not scared now - I look forward to it with excitement."

When Kelly came into the Nursing Skills Laboratory she experimented with the devices by pressing different buttons. If the devices didn't work she would press the buttons again and then finally read the instructions. She explained that it was much easier to correct the programming of the device in the Laboratory than in the Hospital because the device was not being used on a client. Once the machine was attached to a client the situation was different because you couldn't make a mistake. The learning environment in the laboratory was quite relaxed, lecturers were available and approachable, and the Laboratory was the appropriate and best place to in which to learn nursing device use. The only hindering factor was the amount of programmed learning time. On the wards the client's safety was at risk and the wards were not the appropriate place to be learning to use a device for the first time. However, if she had not seen the device before she was not afraid to ask for assistance from another Nurse.

The times when she did feel nervous were when drug calculations were involved in the programming process and when she first entered a client's room and saw a device attached to the client. She said she would wonder whether she knew what she was doing. She felt that when a client was involved they would have their eyes on her and she felt that she couldn't "look blank" or they would pick it up straight away. Kelly further explained "You have to know how to use them to make them [the devices] work. You can't pretend that you know because if you make a mistake its their [client's] safety that is at risk. You are accountable."

Kelly believes that technological devices make nursing work easier. Whilst checking of the client's condition is still necessary the devices do provide the nurse with assistance because of their monitoring and alarm features. This also allows her more time to talk with and provide care to the client. Kelly also realises that machines are not fool proof and that her assessment of the client is vital in determining the effectiveness of nursing care and device function. She also stated that she realised that she was now starting to explore device use and programming in an in-depth manner. She has found benefit from knowing more about both the programming pathways and the functions of a device and knows that it will perform effectively if programmed appropriately.

Kelly sees technology as being a broad term. She describes it as machinery that is changing all the time as new and more effective ways of doing things are discovered and developed. Technology does not just relate to machinery it also relates to procedures, and drugs. The machines have buttons to press and will do the work for you once they are programmed.

Finally, Kelly believes that a nurse is an honest person with well developed communication and management skills. The essential elements of quality nursing care are meeting the client's needs to ensure care which either cures or comforts, being a client advocate and a team person. She says "Nurses shouldn't feel that they know everything- they can be taught, should be open to new technology and open to learning."

Rae

Twenty-two year old Rae who completed her Bachelor of Nursing program twelve weeks ago had recently commenced employment as a Registered Nurse at a large public hospital. Rae also gained employment for a short time during her undergraduate nursing program as a nurse assistant in the Hostel unit of an Aged Care complex. She holds the view that technological devices have benefits for both the client and the nurse. Devices assist the nurse to assess the client and enable the nurse to provide appropriate nursing care.

Rae said that she was most nervous when she used Intravenous Infusion pumps and equipment that she had not seen before and was expected to know how to use the device. Rae explained that she became more proficient with the device each time she used it. Furthermore, as this proficiency and confidence increased she was more able to concentrate on the client and the nursing care she provided to that person. She believed that to be able to competently and safely use technological devices she must feel comfortable and familiar with the device and its functions.

In the Nursing Skills Laboratory Rae learnt the features of the device, and how to set it up, use and monitor its functions. A vital part of Rae's learning was practice with using the device and obtaining feedback on her performance from fellow students and from the lecturers with whom she was working. She stated that "practice makes perfect" but wished for more programmed time in which to practice and perfect her knowledge and skills of device use. Rae also felt that sometimes the group she was working with hindered her learning opportunities.

At home the people who influenced Rae's learning most were her parents. Each played a part but her Father was more influential in the science and computer areas, while her Mother was most influential with the home technologies. Rae also believed that the media portrayed men using technology more often than it portrayed women using devices and this created role stereotyping which influenced learning.

Rae believed that learning at University was different to learning in secondary school. In secondary school (and at home) there was a lot more direction through demonstrations and step by step instructions, than time for practice. Rae said "I like to see things and then put it into practice ...". At university she found that she needed to work out what suited her best and be more self directed and proactive in her learning.

Chin

Chin is twenty four years old and migrated to Australia as a young child. She successfully completed secondary school prior to enrolling in the Bachelor of Nursing program. All of Chin's nursing experience has been acquired through this undergraduate nursing program. Chin, who has experienced being nursed in hospital several times before, was influenced to enrol in a nursing program when a close friend described the enjoyment such a career could bring.

Chin describes technological devices as the equipment that is used in hospitals that have machine characteristics which might monitor clients or administer fluid or medications to them. She also named and used some of the most common devices such as infusion pumps, blood pressure monitoring devices, pulse oximeters, and glucometers. Chin also explained her nervousness when using pieces of technology such as intravenous infusion sets and sphygmo-manometers which were not attached to power units. This type of technology required her to manage the equipment and interpret the information obtained in a different manner than if the devices was powered and/or computer operated. She did not find this as easy as managing a device which carried out these complex functions for her..

At university, Chin liked to first read the instructions with her peers and then practice with the device. She found that there were sufficient lecturers in the Nursing Skills laboratory to clarify or assist her when required. She stated that in the Laboratory "we all learn together, we all discover something new, we reinforce each other, give each other suggestions... We get a better idea." She believed that practising in the Laboratory gave her confidence to enter into the nursing world and nurse clients safely and competently.

Technological devices assist nurses in their work. She believes that devices are faster and easier to manage than some other pieces of equipment. She likes to explain the device to the client so that they understand its function and are not afraid. In this way she believes she is supporting the client and enabling her to care for them in a holistic manner.

At home Chin also liked to read the instructions about device use first and then experiment by trial and error with the technological equipment. Chin likes to learn when something is interesting, but is more motivated if it is something she wants to learn. She also believes that her sister, who was an engineering student, was better able to problem solve and manage equipment than she.

Chin believes the media contributes to the idea that a person's gender influences their ability to manage technology. She argues that the media, in its advertising material, portrays gender role stereotyping and gives the community the message that men learn devices use more quickly than women. Chin passionately states that this is not true. She says "It doesn't matter if you are a boy or girl, some people have different styles of learning- take longer to learn."

Jane

Jane, aged thirty four years, completed an Nurse course fourteen years prior to enrolling in the Bachelor of Nursing program. Her nursing experience as an Enrolled Nurse had been in both acute care and nursing home areas and for the past nine years Jane had worked in that environment. Since completing the Bachelor of Nursing program Jane has gained employment as a Registered Nurse in a large modern hospital.

Jane describes herself as a perfectionist and therefore wants to know as much as possible. Jane's way of learning was to read and then experiment. This was so in learning to use devices both in the home or at University. In the Nursing Skills Laboratory she liked to read as much as possible including the device's instructions in order to understand how the machine worked and determine the device's potential functions and uses within nursing care. Jane stated that she was able to seek advice and support from the lecturers appropriately. She had also found that the scenarios in which devices were used and reflected clinical situations to be of benefit.

Jane was very concerned that through her actions she would cause a client harm. Therefore in her own time she sought to practice within the Nursing Skills Laboratory in order to be able to practice nursing safely. She stated that sometimes she felt that she had limited knowledge about device functions. As a result she had an "Irrational fear of injuring or killing the patient because I didn't know anything about them [devices]." This belief that she had limited knowledge hindered her development of self-confidence. On reflection Jane believed that in fact she had learnt as much as she was could within the Nursing Skills Laboratory and needed to take the next step of using the devices with the clients. Now that Jane has used the skills of managing devices with clients safely, she is not frightened. When Jane is confronted with a device that she has not used before she is not afraid to ask for instructions, and think about what it is she needs to know in order to operate the device safely.

Jane believes that technological devices have a role to play in assisting the nurse to provide appropriate nursing care. They may be used to monitor clients, aid in diagnosis, or therapeutic administration of drugs. Devices aid nursing work by reducing stress and time spent monitoring manual pieces of equipment. Jane believes that technological devices are on occasions, over used. She described a situation where a client, his family and the nursing staff requested the medical officer to conservatively manage the client's illness by giving palliative care only. The Medical Officer refused the request and ordered aggressive management which resulted in technological devices and procedures being used within the nursing and medical management of the client which caused the client distress and pain. Jane found the medical officer's response difficult to cope with and was relieved when the client died and was released from his suffering.

Jane describes her father as being a perfectionist. He was a draftsman and cabinet maker and "he would do everything perfectly so that it would end up perfect. I think I have learnt that from him." She adds that when she did not get the results that she anticipated and became frustrated she would go back to her father in tears and then he would help her by starting at the beginning and showing her everything necessary to get the desired effect. Jane says of her mother "Mum wouldn't have any idea about it." and then says that her mother would have a calming influence and tell her not to get upset or frustrated. She would remind Jane to start again and provide the emotional support necessary to succeed.

Learning in secondary school and in university were not similar. At school Jane was shy and would stand back. She believed that at school she wasn't good at learning and never did well because she didn't want to go into the classroom and learn. If she didn't understand a concept she was too shy to ask questions. At school the teacher stood there and gave a demonstration then she would be expected to copy the procedure. She felt that everyone was watching her and that would cause her to make a mistake. She says of science "I got out of science, except for biology, especially with experiments and things like that. I was too scared to do anything."

Jane then explained that she has changed a lot. The learning environment at University and in particular in the Nursing skills Laboratory has suited her much better. The learning environment in the laboratory is such that she was not threatened. She was able to enter the Laboratory knowing what she had to do because of the learning materials provided, read and experiment and discuss with her peers, seek clarification and "get on with it." If that had been the situation at school Jane believes she would have felt more confident about learning.

Jane believes men learn in different way to women and this is a social issue. She explains "... when I was shy and too scared to do something, it would be a male who would say it is okay. They are more confident. Men have a different attitude. That is my opinion. It doesn't happen all the time, but I am comparing it to the way I know." When elaborating on this point she states that men are more 'gung ho' in learning. Her experience when working with male students in the laboratory is that they would rush in, press every button without really knowing.

She believes the media portrays men as being skilled at science. She believes it is changing and that men and women in science need to be portrayed equally.

To Jane technology means machines and advancements. In naming devices Jane includes computers as well as infusion pumps and devices which monitor, diagnose or administer drugs.

On reflecting about the learning environment in the laboratory Jane was aware that other students were in transition from learners who required direction from the lecturers to those who were becoming self directed learners. Some of her peers used the opportunity to minimise their learning opportunities while others like herself knew what they needed to do and explored the topic fully and learnt as much as they could thus maximising their learning experience. She found the assignment which required her to film herself applying knowledge to a clinical situation and then critiquing that performance to be an assignment of enormous benefit and an empowering experience.

Bev

Bev aged twenty-four explored nursing as a career through work experience as a secondary school student prior to enrolling in the Bachelor of Nursing program. She had no other nursing experience other than that which has occurred during the program.

In defining technology Bev identified mechanical machines that are powered and advance nursing care. Procedures were not considered as technology. Bev said that she had used all of the devices in the Nursing Skills Laboratory before clinical placement, but some were different models. However some of the devices used in the speciality areas such as in the operating room were new.

Bev explained that in learning to use technological devices she and her peers had booked into the Nursing Skills Laboratory before the scheduled nursing practical to learn how to use the devices. She felt that in the scheduled nursing practice sessions it was too crowded and that she was not always able to gain sufficient support from the lecturers because the student/lecturer ratio did not adequately support student's learning needs. Prior to the booked pre-practice sessions, Bev researched her learning needs and utilised the provided learning materials to prepare, then came to the Laboratory and read the learning material supplied, then by trial and error experimented with the device asking clarifying questions of the staff in the Laboratory as required. The scenarios which were supplied which related to the clinical situations assisted greatly.

Bev believed she was nervous when using devices, especially when the alarms sounded. She was thinking about how she would respond when using them on the wards with clients and wondering if she knew enough to be able to respond appropriately when the device was attached to a client and the alarm sounded. On reflection she realised that the practice in the Laboratory did ensure that she felt confident when using the devices with clients on the ward. Once Bev used the devices with clients she felt even more confident. Bev was not afraid to ask for assistance if she had not used a device with a client before. At the commencement of the shift Bev would explain to the staff that she had not used the device with a client before, but had used the device in the Laboratory and asked them to come with her while she familiarised herself with the necessary requirements in order that she could manage the device safely for the shift. She also found that if more than one device was attached to a client that she felt scared wondering how she was going to cope. One didn't bother her, two or more did. Also while she could transfer the principles between devices the different models available hindered her feelings of confidence.

In the Nursing Skills Laboratory Bev liked to work with several peers. She would find other colleagues who wanted to work and learn and practice with them. She noticed that some students were in transition from directed to self directed learners and not everyone wanted to learn as much as she did. Bev also identified how much more confident she felt when she was in third year working with clients than in second year of the program. This was in part due to being more autonomous in practice and the feedback that she was implementing her nursing care well.

Bev did not believe that either parent influenced her learning to use technological devices. Her father would have used the outside and broken equipment, while her mother was involved with the home appliances. Bev has little interest in technological devices outside of those used in providing nursing care to clients. She will learn the

basic functions of home equipment but prefers to get someone else to manage the devices functions. Bev says in nursing it is different. "If I wasn't interested I wouldn't be bothered to learn."

Bev believes the media influences the gendering and stereotyping of women's and men's roles in society.

Bev states that devices assist the nurse to provide nursing care and they are helpful saving her time and making things easier. It allows the nurse to spend more time with the client giving quality care and meeting their emotional needs. This was the side of nursing care that was neglected when I was first learning to use devices and had not yet incorporated device use into a clients care.

Bev also recounts incidents in which clients from different cultural groups refused treatment involving device use but were forced by the medical officers, through use of restraints or medication, to undergo the procedure and treatment. She found this difficult to understand and felt that the client did not have their views considered and did not have the procedure explained satisfactorily enough to allay their clients' fears.

Leonie

Leonie aged twenty two years is disillusioned with nursing and wants to pursue another career which will provide more autonomy. Since completing the Bachelor of Nursing program she has gained employment as a Registered Nurse in a Nursing Home while exploring further study and career options. Leonie has also refused a position as a registered nurse in a large public hospital.

When defining technology Leonie identified only computers. Technological devices were defined as anything that was a machine and powered.

In learning within the laboratory she described the environment as self directed. The opportunity was there to do as much or as little as one wished. She liked to read the materials before she came into the Laboratory and to work in the programmed session with a number of other students and through asking questions. She likes to learn through trial and error. However Leonie believes that she learnt most when on her last clinical placement when she needed to know and apply what she was doing in order to successfully complete the nursing program. She prefers to learn through being involved in clients care.

Leonie believes that men get more advantages in Nursing and that they achieve their personal goals. She explains that men focus on different aspects of nursing. "In the lab the girl will go and pick up the doll, and the guy will go to one of the machines." She further states that the men in nursing 'were not all that intelligent, maybe it was the group I was with. I don't know' Further to this Leonie stated that the media focuses on men stating that all the great inventors are men and that the push for technology comes from men.

Leonie also relates the attitudes of the public who say to her "... why did you go to university to do nursing. So much of that has to do with the doctors because they portray that attitude to the patient when they say 'get me this, get me that'. The patient sees it like that and then they think that the nurse is just a lackey. We just don't have any control. I don't like that."

Julie

Julie is twenty-one years and is now employed as a Registered Nurse in a public hospital. She gained nursing experience during the Bachelor of Nursing program and through employment as a Nurse Assistant in the eight months prior to obtaining her present position. Julie transferred to the campus where the participants for this study were drawn after completing the first two years of her Bachelor of Nursing program at another campus of the same university.

Julie defines technology as computerised and mechanical machines which are modern and newly invented devices. In naming devices Julie names nursing information systems, infusion pumps, and monitoring equipment. Some of the equipment on the wards were newer models to those seen in the Nursing Skills laboratory but on the whole reflected the range practised with in the Lab. Julie believes she didn't pay enough attention in the Nursing Skills laboratory and needed to learn most of it on the wards when she was on clinical placement with in the program. The learning environment in the Laboratory was one in which the equipment was demonstrated and Julie comments " Most of the things I learnt in the skills lab went in one ear and out the other- and at the end of the day when I went home I had usually forgotten. I had a rough idea though!"

Julie explains that at the previous nursing campus to the one in which she completed third year had different teaching methodologies under-pinning the implementation of the program. She found the transition difficult not because she did not know her peers

but because of the self directed nature of the learning activities. At this new campus "I was expected to know what I was doing. I found that difficult." Julie likes to learn in a group so that she can discuss and ask questions to clarify different aspects with them or the lecturers.

She also found that the gender ratio in the groups was different. In the new campus the groups were female dominated, whereas previously the gender balance was more equal.

Julie believes that devices influence nursing care because devices "lessen the load" and reduce nursing time involved in managing less complex but time consuming technologies. Julie was also aware that the devices might not always be accurate and required the nurse to use her assessment skills in interpreting the data obtained from the device about client status. Julie also explained that if a device was attached to a client that the need to check the device gave her an excuse (or reason) to go in and talk with the client. As Julie became more experienced she became more confident and could spend more time with the client than being concerned over the correct functioning of the device.

In discussing gender aspects related to technology use Julie believes that men have more of an idea about its functions than women. As an example Julie says "Mum would run to dad and say the VCR isn't working."

Julie says that nursing is a skilled profession. A nurse has many different clinical skills including needing being able to communicate through appropriate oral and written skills. Julie does not believe that the public value nurses or nursing. She says "I think people's view about nursing are quite old fashioned, they still see nurses as caring women who sit at the bedside and look after the patient." She believes nursing needs more men in the profession in order to change that image.

Yu

Yu is twenty three years old. She migrated to Australia as a young child. All her nursing experience has been gained during the Bachelor of Nursing program.

To Yu technology means devices and computers. She names lifting devices, computers, glucometers, blood pressure monitoring equipment and infusion pumps as devices that she used in the Nursing Skills laboratory and the clinical arenas.

Yu like to learn in the Nursing Skills laboratory by working with her peers, reading the manuals, then practice using the device and asking questions. She stated she does not like to watch demonstrations. In the hospital she liked to watch other nurses using the devices and then manage the client and the device herself. She is also not afraid to ask questions of lecturers or other Registered Nurses. Yu says she feels nervous when she first used devices when they were attached to clients. She explains "in the lab you are working with dolls [manikins] you can't kill them!" She stated that it is easier once she had incorporated the device into client care and she was then more able to concentrate on the client and their nursing needs rather than concentrating on the device. Yu's confidence increased when she got appropriate feedback which reinforced her efforts at managing clients with devices.

A factor which hindered her learning was the ratio of lecturers to students which reduced the availability of the lecturers to be able to provide feedback which reinforced her learning.

In comparing how she learnt to use devices at home at she makes the comment "I have brothers and sisters. When they are not about I read the manual and do it myself, however if another family member is about they usually do it and I have to watch". Yu's brothers usually get in first because they are more confident and know what to do. Yu's mother and father can not read English and are therefore dependent on her older brother, and the two brothers younger than her copy her oldest brother's model.

The learning environment at secondary school is quite different to the learning environment in the Nursing Skills Laboratory. At school the teacher would demonstrate and then they would copy the teachers actions. At university she experimented through trial and error to work things out. Yu believed that she needed to be able to implement what she had learned in the Lab into client care to be able to say she had learned how to use the device safely.

In the hospital sometimes males are asked to assist in the manual handling needs of clients when the client's weight is heavy.

The role of devices in nursing assist in the diagnosis, assist in nursing care by relieving the difficulties associated with less complicated devices but more time consuming. Sometimes the client is scared by the devices, and the nurses role is to explain the function of the device to the client and allay the clients fears.

Nursing is a skilled career It incorporates more than technology. It is both an art and a skill. It is working with clients educating them, the skill with which you provide the nursing care pulls everything together.

In conclusion Yu believes that should learn to do the technical aspects and be more independent rather than relying on males. Women need to be more willing to take charge and believe in what they are doing. The University empowers women, and it is through this empowering that you learn.

The interviewee's

At the time of the interviews the eight women were aged between twenty-one and thirty-four years. Two of the women were not born in Australia and English was not the language spoken in their country of birth. However, all women had completed secondary school in Australia and subsequently entered university to study nursing. In December 1995, these women were successful in completing an undergraduate nursing programme and were eligible for registration with the Nurse Registration Board in this state and able to seek employment as Registered Nurses.

The secondary school educational background of these women was similar for all of these women but nursing experience differed. Seven of the women entered the program immediately after completing their secondary school program and had no previous nursing education prior to enrolling in the Bachelor of Nursing program. The eighth woman had completed secondary schooling and an Enrolled Nurse program fifteen years prior to entering the undergraduate nursing program. Since completing the Enrolled Nurse program she had been employed in various work roles and during the Bachelor of Nursing Program she worked part-time as an Enrolled Nurse in a Nursing Home. Two other women were successful in gaining part-time employment during the undergraduate nursing program as Nurse Assistants in Nursing Homes.

Seven of these women were aged between twenty one and twenty four years and entered University shortly after completing secondary school.. The eighth woman is at least ten years older than the other women and has nursing experience prior to entering the undergraduate nursing program. Her entry into university study followed a different process. However, she did not receive any acknowledgement for prior learning or nursing experience and followed the same pathway as other nursing students and completed the course with the same qualification as the other women. Her story therefore, adds richness to the data collected.

Gender and Technology

The basis for this chapter is from the eight women's responses during the interviews. The way masculinity and femininity were understood and practised within their families of origin and the portrayal of conventional gender roles of women and men by the media are examined to determine social constructions which have influenced the women's perceptions of technology.

Chapter 5

Green (1994:xxix) argues that technology can be viewed as 'an expression of a masculine society.' Wajcman (1991 & 1994) contends that part of the construction of technology as a masculine ideology is based on the assumption that the domestic sphere is a 'technology free- zone.' However, in the home, technologies which include domestic appliances (technological devices) abound and these devices are used successfully by women. However, most technological devices were designed by and are repaired by men. The technical knowledge and physical ability to use technology gives a degree of power to those who use it and within western society men are seen as being technically competent. Further, Wajcman (1994:11) contends that 'to feel technical competence is to feel manly.' Therefore, the technological skills are defined as male property and are both a cause and effect of male supremacy. However, there is nothing inherently different in the way women and men use technology; the difference is constructed and developed in social processes over time in conjunction with hierarchical systems of power.

Family influences

The women were asked to identify which people influenced them the most when they were learning to use technological devices in the home. Those most commonly identified were members of the women's family. Kelly, Rae and Jane immediately named their father as the most influential person in their learning experiences in relation to new technological devices. Kelly and Rae both believed that their fathers were not afraid of machines and had assisted them to be confident when operating technological devices. Their fathers had appeared confident, not in awe of the technological device and had experimented with it successfully prior to reading the accompanying manuals. Jane stated she did not always feel confident when operating technological devices. She explained that her father was a perfectionist and expected

her to be also. When he was working with technological devices he would set everything out, then step by step, read the manual and operate the device showing her everything in detail. However, if Jane had the opportunity to manipulate a technological device by herself and wasn't successful the first time, she would persist until she became so frustrated that she would return in tears to her father for help. He would then carefully go back to the beginning of device function and go over the machine details again. However she would feel inadequate because she had not been successful by herself. For Jane, the supremacy and power of the male family member (father) was evident. Kelly, Rae and Jane's responses confirm Wajcman's view that within a western society males are seen as being technologically competent and that technical knowledge and the physical ability to use technology gave each of their fathers a degree of power.

The other women in the study either named siblings or friends as the person who influenced them the most when they learnt to use technological devices. In this study both male and female siblings were mentioned. One woman responded "I have brothers you know!" she then continued "My mum and dad can't read English, so they depend on my brothers". Importantly, two of her three brothers were younger than she. Two other woman explained that their elder sisters were influential and assisted in operating the device if their fathers were absent. Research by Gray in 1987 and cited in Wajcman (1991) found that siblings (often sons) assume in the father's absence the position of power. These women's responses support this finding.

Mothers were not usually mentioned without prompting. Only Rae included her mother in her initial reply and said "My dad probably had quite a bit to do with it because he was a science teacher, he had the background, used computers. Mum was more with the equipment around the home." Rothschild (1981) and Meredith (1987) assert that women have always been users of technology and while not always having input into technology design, that technology has significantly impacted on their lives, both within the home and the work-place. Meredith also believes that women's approaches to technology are more realistic than men's, that women are more thoughtful about technology's use, purpose and impact on lives and are less likely to be seduced by the emotion and power of technology. Until prompted, most of these women did not acknowledge women's abilities to use technology in the home. Therefore, women managing technology within the home was devalued and rendered invisible and unacknowledged by the women interviewed. In effect these women's responses maintained women's subordination and oppression in society.

Emotional support in learning technological devices was generally not acknowledged by the women. Jane's initial response did not include reference to her Mother.

However, Jane's prompted response of "Mum, in relation to technology, - probably not to get upset about it. She would tell me to calm down and not get frustrated. Start from the beginning. She would help ... she would be more of an emotional support", values the emotional work of her mother, but does not foreground woman's ability to manipulate technological equipment. James (1992) and Small (1996) contend that emotional work (support) is governed by a set of socio-cultural rules which prescribe the appropriate feelings and behaviours for particular situations, and despite its importance emotional work is subordinated to the physical activities which might occur in a given context. Emotional work is therefore usually unrewarded and unacknowledged.

Other replies highlighted women's subordinated place within the family by devaluing and trivialising women's ability to manage and use technological devices in the home. For example Jane said "Mum wouldn't have any idea about it, it would always be Dad." and Julie replied "Mum would run to Dad and say the VCR isn't working." Cockburn (1983 & 1988) asserts that women are subordinated to men within the patriarchal family and are dependent upon men for important everyday life activities. However Bev, who named neither her mother nor father as significantly influencing her when learning to use technology, recognised the roles that each parent played within the home. "Dad would have done the outside equipment, the VCR and the television, the fixing of things, whereas Mum was the microwave, fridge, oven type things, I suppose it's stereotyping." Both Bev's and Julie's response reflects Cockburn's (1983) findings which showed that the division of household of labour was reflected in the use of equipment in the home.

Further, Bev explained that at the home she would learn the very basic functions of the technological devices but much preferred someone else to manage the devices. Bev's reply when asked about using a video recorder was "I wouldn't. I have no idea how to work that sort of stuff, I would get someone else to do it. If I had to I would do it. ... that type of stuff is oblivious [sic] to me, I don't know and I don't care! ..." She was adamant that she had no interest in using technological devices especially television and video recorders in the home unless absolutely necessary and then she would use the basic functions only. Gray (1987) cited in Wajcman (1991) states that women's estrangement from the video recorder is more complex than the implication that the machine is difficult to operate. The estrangement should be understood within the context of the social construction of meaning of 'gendered' technology and not from the aspect of complexity in operating the device. Estrangement should also be considered from the viewpoint that for some women the video and television are principally incorporated into the masculine domain of domestic leisure.

The influence of the media

Fell (1985) contends that the media continues to perpetuate the domination of men and the subordination of women in its format of articles and in its portrayal of world events. Furthermore, the text and images that are published often portray women in a way that is demeaning and trivialises their positions in the world. This portrayal of gender relations and gender identity material serves to confirm and maintain the stereotyping of gender roles within a society.

The women interviewed in this study substantiate through their responses their belief that the media portrayed conventional male dominated gender roles about who used technological devices. Rae explains "It [the media] is very much male dominated and it is more male dominated on the use of technology." Further, Rae held the view that while the media played a part in maintaining conventional gender roles she believed that people take little notice of the image portrayed. Chin believed that the media portrayed men learning to use technological devices more quickly than women. However, when asked if the view that she believed the media portrayed in relation to women and men's learning was true she replied "No, No chance!" For Chin, the image that the media portrayed maintained the social construction of conventional gender roles for women and men both in the home and the work-place.

Bev was adamant in her response that the media influences everything, stereotyping men and women in their roles and perpetuates in part how nurses envision their nursing role. Yu stated that women should become independent, should learn to use more technical equipment and not rely on males. When asked what she thought stopped her from being independent she replied, "The media and society, it is how they make us feel.". Leonie also believed that the media focused on men "because all the great inventors are men, so the push for technology comes from males." Fee cited in Byrne (1993) asserts that the acknowledged inventors are men and this has contributed to technology being viewed as a masculine genre and culture. In addition, women's contributions to technological development are absent in text, and women, when portrayed are usually at home and in the background (Rothschild 1981; Cockburn 1988; Wajcman 1991). The continued portrayal of men as inventors and the non acknowledgement of women's contribution to technology development continues to foster the exploitation and exclusion of women. Further, in a western society, the meaning of technology is constructed in masculine terms through language and the gender division of labour embodied within the gendering of work both within the workplace and the home. Thus the power of the male is maintained and women are rendered invisible and of little consequence.

The least critical response towards the media was Jane's. "They [the community] say that boys always go to science, before the media played a role. I think it has changed a lot. It should be more equal.". Jane implies in her belief that there is some shift towards a more equal representation of gender relation and gender identity portrayal within the media. However the dominant ideology remains. These women concur with the views contained in the literature; the media continues to maintain and perpetuate the domination of men and the subordination of women in the construction of gender relations within a western society.

Influences of secondary schooling

The woman explained their perceptions of secondary school experiences and their responses were all different. Leonie explained "The school where I went [sic] treated us all equally. Males had to do even what was considered to be feminine things." Julie said I wasn't very scientifically minded. I did Year 10 Biology, Physics and Chemistry. I studied by myself and wasn't very interested." Jane explained, "I wasn't good at learning because I was too shy, I didn't want to go in there and learn. English was my worst subject. If I didn't understand something I wouldn't say anything, and the same would apply to science. I got out of Science, except for Biology, especially with experiments and things like that, I was too scared to do anything."

Pocock (1988) asserts that students should not leave secondary school feeling that they are unable to ask questions for these are life skills, therefore the education of girls is a social justice issue. Further, if girls are not educated appropriately the quality of their lives is affected and career aspirations and career choices are limited because of the educational process received in primary and secondary schools. The desired educational goal for exiting secondary school students should be that they are confident in their own abilities, able to ask questions, and are not frightened or passive consumers of technology.

Notions of technology

As previously discussed there are many definitions of technology. The essential elements of technology are described as '... drugs, devices and procedures used in health care, as well as the organisational and support systems within which such care is delivered.' (U.S Office of Technology Assessment cited in Pillar, Jacox & Redman 1990:16). Similarly the women in this study essentially described technology as

determined by the definitions contained within the published literature in the western world. Their definitions of technology were contextual to nursing, and technology was seen as "advancements", "modern" and "changing". In addition each response contained a reference to machinery. Two statements: "Technology to me is computerised and mechanical things. Modern stuff." and "Technology is something that is changing all the time...It can deal with the way people approach other people or machinery, or new technology for replacing books or new drug regimes", reflect the similarities within the responses. Only one woman was adamant that technology was powered machines and "not procedures!"

The women's choice of words such as 'modern', 'advancements' and 'changing' reflects a construction of meaning of technology not readily found within literature defining technology. These words suggest that technology provides new possibilities, new techniques, new tools or devices which will be more able, more efficient or more effective than those which are already in existence. Reiser (1986) Cockburn(1988), Callahan & Healey (1992) Sandelowski (1993) Erlen (1994) asserts that technology has the power which seduces people, to create a technology imperative. In effect health professionals might believe that if there is a particular technology available then it must be used. This can lead to a technological dependency and over time the technology's use for similar situations becomes routine. Also the power of technology can affect not only the health professions, the power of technology can extend to clients and their families who can 'become enticed by the magic and power of technology' Earlen (1984:51).

Cail (1993) writes that technology is a new word in the vocabulary of people. She argues that the word technology has replaced the word 'invention'. Previously, the term invention had been used to describe machinery which was created to reduce human energy in work. The inventions primarily supported men's occupations then, progressively inventions began to focus on activities which were thought-directed and often involved highly repetitive manual dexterity skills. Therefore, she believes that the use of the word 'technology' is modern and was assimilated into everyday language in the early 1970's coinciding with the formation of the feminist movement and space developments. Cail believes that the introduction of technology and its use in the home and workplace have changed women's lives forever because technology has had a liberating and beneficial effect freeing women from intensive human energy labours. Or has it?

Women clerical employees see the introduction of new technology as a contribution to enhancing their skills and efficiency and believe their work is more interesting because it removes uninteresting repetitive work. Other women see technology as depriving workers of their traditional skills, fragmenting and trivialising their previous work. Both groups of women assume that increased productivity will result from the introduction of new technology (Probert 1993). The nursing literature also discusses the role that technology plays in nursing work, with some authors showing benefits for nursing work while others arguing that technology detracts from and is incompatible with the essence of nursing work (Hickson 1990; Sandelowski 1994). Further, Wajcman(1991) asserts that in spite of the nature of work and skills performance required to do that work, work processes have been changed but the portrayal of conventional gender roles of tasks has remained stable.

Cockburn confirms this view stating that electronic technology has been a major influence in changing workplace skills. This is so for nursing and the majority of technological devices mentioned were powered. The majority of women named technological devices that could be clustered into the therapeutic, diagnostic and organisational/administrative categories of health care technology as described by Banta & Luce (1993) and always the technological device was seen as an adjunct to nursing care. The most frequently mentioned technological device was the intravenous infusion pump. Other devices that the women named were blood glucose monitors, blood pressure monitors, pulse-oximeters, oxygen and suction systems, electrocardiograph recorders, cardiac pacemakers, anaesthetic machines used in theatre, manual handling aids, computerised nursing information systems, and drug delivery systems such as epidural and spinal portacath. Also the majority of the women indicated that these devices represented those technological devices that they had seen and/or used either in the nursing skills laboratory, or in hospitals during their undergraduate nursing program. The women's responses confirm the wide array of technological devices which are used by nurses in providing nursing care to clients. The women participating in this study believed that the technological devices that they were using were adjuncts to the nursing care of their clients.

The gendering of women and men into masculine and feminine is a cultural process of power and this is also extended to occupations, and nursing is regarded as a feminine occupation. Therefore, nurses in the public sphere are generally not valued for their technical competence, nursing knowledge and skills. This knowledge, skill and ability to operate technological devices is undervalued, unacknowledged and rendered as invisible. This injustice is maintained by the hierarchical systems of authority within the workplace. In addition, the power of technology can be compared to male power and

supremacy and is developed over time through social processes in conjunction with hierarchical systems within society (Cockburn 1988).

The women's responses identify some significant ways in which women are subordinated to men, and how conventional gender roles are maintained, by families, the influence of the media and educational institutions. The following chapter will explore the women's learning experiences when learning to use technological devices.

The Women's Learning Experiences

The basis for this chapter is from the responses of the eight women who were interviewed. The women's experiences in learning to acquire and apply knowledge of technological devices are examined in order to identify facilitating or inhibiting factors.

Chapter 6

As previously attested undergraduate nursing programs provide educational opportunities for nursing students to acquire technological device knowledge which can then be applied in the clinical setting. The selection of appropriate teaching methodologies/strategies to be utilised in the learning process depends upon the educational philosophy which embodies the faculty's belief in a particular theory of learning. Theories of learning encompass complex concepts and beliefs about learners, teachers and the learning environment .

Theories of learning and the debates that each theory stimulates have been part of educational discourse since the time of Plato and Aristotle. As the literature review attests one of the themes which has emerged is the belief that learning is an active process and that learning is sustained if the learner is active and involved in it (Curtis and Boulwood 1961; Lindgren 1962; Dewey 1963; Butts 1964; Stones 1966; Ausubel 1968; Van Ort & Putt 1985; Blencky, Clinchy, Goldberg et al 1986; Burnard 1990).

How the women learnt

In this study all the women said that they learnt best when they were actively involved in the learning process, when they were interested and what they were learning was relevant to them. Kelly explained that in the laboratory " I learnt how to turn them [technological devices] on and off, how to run them off the mains and the battery, how to open doors, how to program it and access it's memory, how to trouble-shoot as well as the dangers of the device to the client, how to dispose of waste and clean the machine after it was used. ... You've got to learn and 'play' with it while you've got the chance." Bev stated that although she had little interest in technological devices outside of those used in providing nursing care to clients, she was comfortable, interested and willing to learn about technological devices used in nursing. She said, "If I wasn't interested in nursing I wouldn't have bothered to learn!" Leonie and Julie gave the example of relevance of learning material when they stated that they learnt the most about

technological devices when they were on the wards with their facilitator in their final hospital practicum. Therefore, the comments by Kelly, Bev and Leonie support the premises that a learner will learn efficiently when there is a perceived need to know; and that if the learner is actively engaged in the learning process, learning will be sustained.

In the Nursing Skills Laboratory the majority of the participants read instructions first, then experimented with the technological device, sought clarification from lecturers as needed and asked their peers for feedback on their performance. Jane explained that "my way of learning was to read everything before I actually touched it. ... Then I started playing with the buttons." Similarly Chin said, "At school [university] we read about it and when we go into the lab we usually work with peers. If we had a problem there is a supervisor there to help you on to the right track if you get stuck." When considering who assisted them in learning to use technological devices the women stated that they all preferred to learn in groups. For example, "I like to work with other people and two heads are better than one." and "In the Lab we all learn together, we all discover something new together, we reinforce each others suggestions, lecturers give us guidance." Byrne (1986) asserts that women more than men prefer to work in groups and that women prefer to teach using a student orientated discursive format as opposed to a direct information transmission approach.

Analysis of the women's responses identified that the predominant learning style used when learning to operate technological devices was the discovery or experimental approach. Discovery learning is a desirable outcome of teaching whenever the aim of the activity can be specified in detail and is broadly the same for each learner. There is a difference for the learner between instructional learning and discovery learning (Stenhouse 1975). In instructional learning the learner is seldom able to decide what to learn, the teacher holds the power and is in control of the learning situation. However, in discovery learning the learner is more able to determine learning needs to meet learning goals and the balance of power between learner and teacher is altered. The teacher (the expert) in discovery learning becomes the 'resource' and is available to be questioned and facilitates the acquisition of knowledge. Therefore, one aim of the discovery learning method is to reduce the hierarchical authority of the teacher.

In discovery learning the teacher, introduces the learners to selected or devised situations which embody the implicit principles of knowledge that the teacher wants the student to learn in a way that is meaningful. The women explained that the scenarios which had been devised to assist them to use technological devices were most beneficial. Not only did the scenarios integrate the device into nursing care but the scenarios required them to think critically and apply nursing knowledge. The

debriefing sessions which followed the learning experiences valued the women's subjective and objective experiences. Teaching methodologies that value subjective and objective knowledge in a way that values a person's, thoughts and feelings facilitates the learner's motivation and can facilitate empowerment (Heinrich & Witt 1993). Other teaching strategies that the women identified as empowering and beneficial were the videoing, self evaluation and critique of a nursing skills procedure.

Cognitive difference

Another theme in the literature is the notion that women and men have cognitive differences and learn in different ways from each other (Lindgren 1962; Ausubel 1968; Golonka 1986; Chivers 1987; Seidl & Sauter 1990; Heinrich & Witt 1993; Bent 1993). In addition, Golonka (1986) asserts that there is a cognitive difference in the way women and men approach technology and that these differences are measurable. Leonie said of her experiences in the Nursing Skills Laboratory, "They [the men] tend to focus on different things ... the girl will go and pick up the rubber baby, and the guy will go on to one of the machines." Chin held the view that different learning styles influenced the speed of learning and that particular learning styles are unrelated to gender. Jane's response reflected her belief in conventional gender roles influencing learning. She said, "I think in relation to the way men learn something and the women learn something there is a big difference and that is a social issue. For example, when I was shy, I was too scared to do something, it would be a male who would say it is okay. They [men] are more confident. Men have a different attitude." Leonie, Chin and Jane's perceptions of the way women and men learn do not substantiate the view found in the literature that women and men are cognitively different. Nor do their responses support that these cognitive differences are measurable. Instead, the responses support the feminist poststructuralist view that women and men have been socialised in different ways through patriarchal systems of power. Through these systems of power a myth about women's learning has been socially constructed and in part maintains women in the position of difference, subordinated to men. Further Leonie, Chin and Jane's responses reflect the complexity of the contemporary debate about women's and men's learning and different ways of manipulating technological devices.

Golonka (1986) asserts that women become stressed when they work with any technological device and believes that this is because of women's differences in mathematical and mechanical aptitudes. Conversely Byrne (1993) contends that the notion of difference between women's and men's cognitive abilities, including

mathematical and mechanical aptitudes and capacity to manipulate machines, is based on assumption, belief or prejudice with no supportive research. Kelly and Chin stated that they felt stressed when drug calculations were involved. Drug calculations involve mathematical ability, knowledge of correct drug dosage for clients often based on weight and age, and the manipulation of a device to ensure that it delivers the dosage of medication correctly. Chin found infusion devices that were calculated and regulated manually more stressful than machine controlled devices. Use of manually regulated infusion devices require the nurse to monitor more client variables. For example, the effect of the client's limb movement on the intravenous infusion rate or catheter occlusion must be visually detected by the nurse. However, with a machine controlled device, the machine detects these variables and either makes the necessary adjustments to maintain flow or alerts the nurse through the sounding of the alarm. Responses from this small research sample cannot be used to substantiate Golonka's view of mathematic and mechanical difference between women's and men's ability to use machines. Rather, these responses focus the debate on the complexity of providing safe and competent nursing care to clients. The main thrust of all the women's responses was to ensure client safety, and contained within each response was the notion that the nurse should do no harm.

The influence of past education processes and societal influences on gender identity, including confidence, and the ability of the women to use technological devices, cannot be discounted. Earley (1985) and Chivers (1987) both assert that girls are disadvantaged by the nature of education received compared to that received by boys in primary and secondary school education. Earley contends that girls are biased away from choosing subjects based in mathematics, science and technology and the subjects that they then choose have limited technical or scientific orientation. Further, the level of attainment in educational programmes is greater by boys than girls (Earley 1985; Chivers 1987; Byrne 1993). Thomas (1992) asserts that teaching's androcentric methods and the male dominated culture of history influence knowledge and truth. Further, Thomas asserts that traditional teaching methods assume that the teacher will develop the curriculum and by this means establish authority through assessment of student progress in meeting prescribed goals and achievements. This authority gives power to the teacher and if the teacher is not aware and sensitive to the nature of education that has disadvantaged girls then the confidence of girls in their ability to achieve success with mathematics and technical oriented subjects will not be increased. In addition, Earley contends that in a western society schools contribute to the transmission of ideas of masculinity and femininity and in part maintain the portrayal of conventional gender roles considered appropriate for women and men. As previously stated, in a western society men are generally portrayed as being more

technologically competent. Women's invisibility in the literature on technology and nursing may also influence women's estrangement from technology and lack of confidence in their abilities to operate technological devices.

Stressors and how the women felt

The women experienced various feelings when learning to use technological devices. Feelings depended on the device, the number of devices used in providing nursing care to a client with a technological device and the environment in which the woman used the device(s). Being nervous, concerned, stressed or relaxed depended upon the context in which the women were learning. The women in this study all viewed learning as a continuum that began in the University with lectures, tutorials and nursing skills laboratory practicals and ended in the clinical practice area when they had safely cared for a client with a technological device. The women were more relaxed in the skills laboratory than in the clinical area. The women explained that due to the fear of causing client harm they were most nervous when first incorporating the technological device into client care. Their fear was that they would not be able to programme and manage the technological device appropriately. Kelly explained "you couldn't make a mistake; the patient was always there watching you. It was their safety that was at risk. So you had to know what you were doing ... The Lab was a learning place so it doesn't matter if you make a mistake ... in the Lab it was quite relaxed."

The women identified a number of technological devices that caused them stress. Some devices were powered and others were not. The infusion pump was identified as the most stressful technological device and the alarm noise of the infusion pump the most frequently mentioned cause of stress. The women elaborated further. The primary cause of stress, was that they would not know how to manipulate the device appropriately when they responded to the alarm, followed by the secondary fear of harming the client if their remedial action was ineffective. These findings correlate with that of McConnell & Nissen 1993; McConnell, Fletcher & Nissen 1995; McConnell 1995; McConnell, Cattonar & Manning 1996.

Non powered technological devices were also stressful and anxiety producing. The women specifically mentioned manually regulated intravenous infusion sets, blood glucometers which involved reagent strips and the timing of blood contact prior to inserting the strip into the device, electrocardiographic recording devices (ECG) and manual blood pressure recordings. The ECG and glucometer devices are also among technological devices identified in the literature as causing Registered Nurses anxiety

and stress (Pelletier 1992; Neighbors, Eldred & Sullivan 1990). However, manually regulated infusion devices and blood pressure recordings are not identified in the literature. Chin explained that at first she was particularly concerned about taking a manual blood pressure reading if it was for an elderly person "They are so fragile and if I pump it up too much I might hurt them, and if I do it too fast I won't get the systolic [blood pressure reading] ... I was very nervous."

The number of devices in use with any one client at one time was also mentioned as a cause of stress. The women explained that the more times they were involved in providing nursing care to clients who had devices in use within that care, the more comfortable they felt. "After you have done it a few times you are all right, you get used to it." The women also clarified that at first their focus was only on the technological device, but as their confidence increased, they were more able to concentrate on the client and incorporate the device use into the client's care more appropriately.

The majority of women identified inadequate time to learn and practise as a stressor that hindered their learning to use technological devices. Bev learnt best when she prepared herself by booking into the laboratory for a practice session prior to the practical. In this manner she and her peers had more time to learn and could look at the equipment, experiment and gain feedback on their actions before the scheduled practical. "We had a lot of time to ourselves, looking over the buttons and how to work it, without being rushed in the lab session". Chin believed that the more practice time that she spent in the Nursing Skills Laboratory with the technological devices the more she felt comfortable and able to manage the device when she incorporated it into her nursing care of clients.

Several women mentioned the stress and lack of confidence they felt when the model of a device differed from the one with which they had become familiar. Lack of knowledge was identified as a stressor that inhibited feelings of confidence. Jane, in response to factors that hindered her feelings of confidence, said "My lack of knowledge. ... I have learnt as much as I could in the Laboratory, once I actually did it [on the wards], it didn't frighten me. ... I think I had an irrational fear of killing someone." All participants highlighted their need to be competent in practice through having the knowledge of why the device was being used and how to safely operate the technological device. This included not only programming the device but how to interpret the meaning of alarms and taking remedial action which ensured client safety. Importantly, the women stated their need to make clinical nursing decisions based upon

their application of nursing knowledge and ability to appropriately read and interpret the physiological data that the monitoring or therapeutic technological device provided.

Nurses need to be proficient users of technological devices inherent in providing nursing care to clients. Recent research on Registered Nurses in Australia and the United States of America (McConnell 1990; Neighbors, Eldred & Sullivan 1990; Pelletier 1992; Cohen & Davis 1993; McConnell & Nissen 1993; McConnell 1995; McConnell, Cattonar & Manning 1996; McConnell & Hilbig 1996) identified that Registered Nurses who are not adequately prepared through educational processes to use technological devices may fear the equipment and have increased anxiety and stress relating to those devices. Further, the research has identified that the most frequently identified reason for incidents of client harm was user error caused by inadequate device education (McConnell, Cattonar & Manning 1996; McConnell & Hilbig 1996).

Stress is an identified component of any learning situation. Audet (1995) asserts that some anxiety may actually enhance learning, but too much anxiety will inhibit it. Johnstone (1984) contends that memory overload inhibits learning ability. The responsibility of educators is to provide learning experiences and opportunities that facilitate proficient device use in client care. To facilitate learning and minimise stress, the learning environment is specifically created. The learning environment is safe, non-threatening and has a non-hierarchical culture and the educators are supportive, caring and non-threatening. The educators choose and use appropriate teaching methods to stimulate and facilitate student's learning. The teacher is then better able to value the student's experiences and provide constructive, positive criticism. This in turn reduces learner anxiety and stress, and increases self confidence, motivation and desire to learn. However, in the clinical arena (a learning environment that complements the Nursing Skills Laboratory) it is more difficult for the teacher to provide a learning environment that has a non-hierarchical culture. Therefore, expert teachers who can facilitate and support the student in clinical areas are required to facilitate the learning process (McClure 1991).

Teaching methods

The women explained that the teaching methods utilised in secondary schools differed from those used in the Nursing Skills Laboratory. At secondary school, learning was teacher-directed and included demonstrations and/or step by step instructions about how to use various pieces of equipment. Yu explained that "At [secondary] school we would work in pairs and the teacher would first demonstrate the equipment. Here we

play around with things and then try to work it out." Similarly Rae said that there is "A lot more direction at home and school, and here [university] you can only do a certain amount and some of it you have to and figure out what suits you best." Conversely, Julie who had transferred from a School of Nursing in which technological devices were only demonstrated, responded that "most of the things I learnt in the other [Nursing] Skills Laboratory went in one ear and out the other and by the end of the day when I want to go home, I had usually forgotten. Sometimes I had a rough idea. I could cast my mind back when I was on the wards and say 'Oh yeah I did that!'" Julie continued "I found practicals here very difficult ... at the other campus the lecturer would talk about it and show us how to do it. Here I was expected to know and I was expected to know what I was doing.' She continued, "I think it is easier to learn when I am in a group ... When you are on your own you stumble through you feel you can't ask people questions." These comments confirm that effective learning demands the learner be active and involved and not a passive observer.

Although some of the women interviewed stated that they would like demonstrations they preferred to learn through techniques that involved working in groups, reading, questioning, experimenting and discovering for themselves, and gaining reinforcement through results and teachers and peers comments. Julie's comments about demonstrations of equipment and being unable to retain the knowledge given by the teacher confirms the limited value of demonstrations as a mechanism for learning if not used with other teaching strategies that reinforce knowledge acquisition and application. The differences between the teacher-directed learning style of secondary school and the other University's School of Nursing confirms that the learning environment created at the School of Nursing where this study was conducted is different and effective.

The women participating in this study confirmed that the teaching strategies in secondary schools were different to those used in the Nursing Skills Laboratory. All the women viewed learning as a continuum that began with the theoretical and practical components at University and continued into the field of nursing practice either in acute care nursing area or community practice areas and ended when they had safely incorporated device use into their own client care. Jane, Bev and Leonie also recognised that as learners they were more self-directed in their learning and pro-active in ensuring that their learning needs were met, than other student nurses within the undergraduate program. The other students were still in the teacher-directed mode of learning or were in various stages of transition from directed learners to self-directed adult learners.

Gray (1995) contends that feminist teachers strive to create a learning environment in which students value their own abilities and themselves and are able to apply knowledge, critique their actions, share knowledge and interact fully in the learning process. In the past, nurses have been exploited as cheap labourers and given minimal education and were expected to memorise procedures to minimise mistakes. These practices have maintained rituals in nursing practice, encouraged subordination of nurses and maintain the dominance of medicine over nursing and medical officers over nurses. If nursing is to move forward, then nursing education must empower student nurses by facilitating their abilities of critical thinking and questioning, and promote inquiry into nursing knowledge and practice so that the status quo is challenged and changed (Cohen 1993; Wink 1993; Tschikota 1993; Tanner 1993; Oermann 1994; De Luca 1995; McAllister 1995). McAllister (1995) contends that feminist pedagogical thinking has provided teachers with direction that will balance the needs of learners and teachers with curriculum content through promoting inquiry, questioning and critical evaluation of knowledge and using various teaching strategies to achieve the expected learning outcomes. As Blenky cited in Gray (1995:79) Palmer et al (1994) and McAllister (1995) asserts, nurse teachers must listen to the 'silenced voices' so that the unequal balance of power between the teacher and learner is altered. In this way, the learner is active, and the role of the teacher to teach and guide is not diminished but rather, changed to that of facilitating and the balance of power between teacher and learner is altered to be more equal.

Creating the learning environment

The Nursing Skills Laboratory is the focal point for the integration of nursing knowledge with psychomotor skills. The environment which is created there should be dynamic and imaginative. The Laboratory's main purpose is to provide a 'simulation of reality' in order for the student nurse to learn and become skilled in practice without the distractions of the clinical setting. Then when entering the clinical area the student nurse can focus more on the client and less on the technological device while providing nursing care. Hansen (1993) explains that activities within the Laboratory should allow the student freedom to choose and move between activities at her/his own pace and/or work in groups as needed in order to achieve the desired educational outcomes. Faculty staff should provide guidance and feedback as required. As the student successfully practices and incorporates skill and knowledge, confidence increases. However, the women participating in this study viewed learning as incomplete until it had been safely incorporated into client care a number of times within the clinical area. It was then that empowerment for the women resulted.

Feminist thinking is also impacting on theories of learning and educational processes. The importance of the learning culture is an emerging theme within the literature (Stenhouse 1975; Blenky, Clinchy, Goldberg et al 1986; Schuster 1993). Stenhouse (1975) asserts that the learning culture consists of not only the physical facilities, the learner, the teacher, and learning materials, but also the ambience which is created through the use of various teaching strategies. Further, the context in which the learning occurs and the quality of the interaction between the learner and the teacher is influenced by both the learner's and teacher's attitudes, motivation and self perception. The self perceptions of the learner and teacher are developed through interpreting past learning experiences within the social milieu that surrounds each experience. In turn, this interpretation influences each person's construction of meaning about gender identity and gender relations which then influences the next learning encounter.

The culture of the school as an institution influences the character of the knowledge offered to learners. That is, the school influences the experiences of both the learners and the teachers who facilitate the curriculum offerings in unplanned ways. The massing of students, evaluations of performance, the giving of praise and the inequalities of power between learner and teacher form a hidden curriculum (Stenhouse 1975). The content offered in the hidden curriculum may either contradict or reinforce the programme's curriculum intentions but since it is not publicly acknowledged and is taken for granted, it escapes policy control. By either valuing or non valuing the work of the teachers and their actions or the content taught, the school establishes reality or constructs its view of knowledge. If education is to be effective, the underpinning school culture, including beliefs about the social construction of knowledge and reality, and theories of learning must be considered. In this way a learning environment that facilitates learning and empowerment can be constructed through the appropriate selection of various learning experiences and activities.

The Nursing Skills Laboratory in this study provides a safe, supportive environment in which students can experiment, practice, gain information and receive feedback on their learning activities from experienced nurse academics. Workbooks are provided at the commencement of the semester to encourage pre-reading before each practical session. Prior to, and during the learning sessions in the Laboratory, nursing students are encouraged to be self-directed and to work in groups at their own pace and seek guidance as necessary. The workbook also assists in the learning process because it contains questions that stimulate the student's reflection and critical analysis of learning. The participants' responses as to how they learned to use technological devices reflected the educational philosophy that underpins the learning environment

provided in the Nursing Skills Laboratory. Heinrich and Witt (1993) contend that feminist teaching approaches for adult learners should be interactional and experiential and provide time for discussion with other students and time for reflection in action and on action. Such an approach encourages the use of a reflective diary to help in connecting knowledge of personal experience and learning.

The art and skill of using reflection as a tool in the learning process is an emerging theme within the literature (Dewey 1963; Benner 1984; Street 1990; Lawler 1991; Palmer, Burns & Bulman 1994). Learning through reflection is a complex process and requires the undergraduate student nurse to critically analyse and interpret her/his own work through 'intellectual consideration of other options' in order to achieve professional beginning competence and standards of nursing care (Palmer et al 1994:70). Most school leavers are more comfortable with learning from books than with learning from reflection. Reflection as an effective learning tool requires that the learner have time to critically analyse actions and have access to expert teachers available to help them develop critical inquiry skills. Palmer et al (1994) assert that learning by using reflection is best suited to adult learners who have intellectual maturity that allows them to explore differing perspectives of ideas or notions of reality. Comments by Leonie, Rae and Jane suggest that discovery learning is difficult for some students especially if they are in transition from being directed to self-directed learners and if expert teachers do not have the available time and energy to provide feedback and guidance. Also the student-teacher ratio must be sufficient to adequately support students' learning. If learning by discovery is new and requires support then the process of critical inquiry will also require such support. However, the advantage of persisting with critical inquiry and reflection on and in actions as a learning tool, is that it leads the learner towards thoughts and actions which will challenge rituals and taken-for-granted practice procedures thereby changing the status quo of nursing knowledge and practice. If nursing practitioners are adequately prepared and supported in using critical inquiry then this methodology will have an emancipatory effect for nursing.

Empowerment

An identified premise of feminism is that the benefit of education for each woman should be transforming, empowering and emancipatory (Pearson 1988; Schuster 1993; Palmer et al 1994). Yu explained her feelings about her education at University. "The [nursing] school teaches new things, women realise what is happening. Women let males take over, we used to depend on males too much. We shouldn't rely on males,

because you don't learn that way." Other students explained that they learned because they could practice in the Nursing Skills laboratory and that the environment created enabled them to explore, practise asking questions and receive feedback on their actions and knowledge. An environment that fosters a relationship between learner and teacher, which facilitates the acquisition of knowledge through involvement and minimises the teacher's power over the student is more likely to be meet the learning needs of women and empower them (Thomas 1992). Working in groups and exploring together with sufficient reading materials to support the activities further assists in this emancipatory process. Bleney et al (1986) contend that women desire educational experiences in which the lived personal experiences are valued, the balance of power between teacher and learner is non hierarchical and active participation in the learning process occurs.

The environment created by the Lecturers and the teaching methods utilised within the Nursing Skills Laboratory in this study influenced participants' feelings about and levels of comfort with learning. Thus in response to a question about the similarities and differences between secondary school and the Nursing Skills laboratory's teaching methods Jane replied "Here at [university] you go in there [to Nursing Skills Laboratory], this is what you need to do, go through it discuss with your peers and get on with it. If that was the [teaching method utilised in the secondary] school situation I would have done better, because I wouldn't be have been so threatened by everyone watching and having to do the same thing at the same time, and if you made a mistake everyone would know." This response typifies some of the women's responses. Therefore the learning environment and teaching strategies used in the Nursing Skills Laboratory has minimised the stressors, and empowered the women.

Learning for women particularly the acquisition and application of knowledge as it relates to proficient technological device use, is not a level playing field. Social construction of gender identity and gender roles of women impact on learning experiences and perception of offered concepts of knowledge and action. The influence of past learning experiences embodied within the family context, the media's portrayal of gender roles, and educational processes often in patriarchal, hierarchical institutional structures, influence both the learner's and teacher's interactions as well as the learning environment and school culture. These factors, will in turn, influence these women's notions of nursing work and technology and will be explored in the next chapter.

Nursing and Technology

The basis for this chapter is drawn from the responses of the eight women interviewed. The women's perceptions of nursing, and the value of technological devices in nursing care are examined. Discussion centres on the social-cultural construction of nursing and the effects of the hierarchical systems of power on it.

Chapter 7

The nursing education for seven of the eight women was minimal before to entering the undergraduate nursing program. Importantly, prior to entering the undergraduate nursing course none of these women had provided nursing care with all the complexities of decision making, and applying of nursing knowledge and clinical skills in the assessment, planning, giving and evaluating care in the same manner as a Registered Nurse. Therefore, the provided learning experiences and opportunities of the undergraduate nursing program further developed the women's perception of nursing.

The women's perceptions of nursing

The women were asked to identify the essential elements of quality nursing. The majority of women explained that the essential element in providing quality nursing care was the nurse and her/his ability to provide skilled nursing care that would meet the 'holistic' needs of the clients in their care. Each woman explained their view in their own way, placing an emphasis on both the physical or emotional aspects of nursing work. For example, Kelly explained "Quality nursing should be meeting the client's [nursing care] goals to make them comfortable, make them better, answer their questions ... You should be intuitive enough to pick up if the patient is anxious or nervous." while Chin replied "I think caring, being non judgmental, care about this person holistically and whatever the person needs - meet their needs and be their advocate if you can." Rae explained, that for her nursing was "doing things to the best of your ability, using equipment how it is meant to be used and checking that you are using the equipment correctly."

As these women's responses confirm nursing work involves meeting both the physical and emotional needs of clients. Nurses through their nursing work have intimate contact with clients and help manage the emotions and feelings that are evoked as part

of that intimacy when modesty and privacy of a client are invaded via procedures (Benner 1984; Lawler 1991; Lumby 1991; Small 1996). Further, there is also a public expectation that nurses will be caring and compassionate and able to identify the fears and anxieties of the sick or dying client and provide both emotional support and physical care for them, and at the same time provide emotional support for the anxious and distressed relatives. In addition, James (1989) contends that emotional labour is an important component of care which occurs with physical labour and requires organisation. Further, Small (1996) asserts that meeting physical needs of clients dominates nursing work and that meeting the emotional needs of clients is secondary to meeting physical requirements. Emotional work demands that the nurse becomes involved and gives attention to the client on an emotional as well as physical level (James 1989). In order to be able to do this the nurse needs time to develop a rapport and establish an open, honest and trusting relationship with the client. This requires the nurse to have sufficient time to develop and established a relationship that will allow the nurse to provide effective physical and emotional nursing care for the client. In this study, the majority of the women explained the importance of meeting the client's physical needs but placed the emphasis on meeting the client's emotional needs. For them, that was the essential element that ensured quality nursing care.

In acute care settings, the routines for meeting physical needs and schedules (often ritual based) usually take precedence over emotional work. That is, the emotional work becomes secondary because of time constraints (Holden 1991; DeLuca 1995). The time restraints are necessary for the efficient functioning of the unit or ward area in order to meet the medical goals of treatment but are usually invisible to the observer. Further, James (1989) contends that the insidious nature of the pressure to work to meet the prescribed time schedules within duty hours forces the nurse to only meet the emotional needs of clients as time allows. Julie provides an example of technology's power, and the subtle pressure of meeting time constraints, taking precedence over the freedom to talk with a client as part of providing quality nursing care when she explained "With the PCA (Patient Controlled Analgesia) device when you go in and check every hour, I find that this is an excuse to talk to the client."

Reiser (1986) asserts that each new technology is selective and restrictive in its focus on the client and will affect the simple tools and techniques that were once used to evaluate a client's well-being. The technology will cause the nurse to focus on the device's function and capabilities to provide data that can be used to evaluate the client status, so that the nurse might make clinical decisions without considering the subjective feelings of the client and other objective data that she/he might otherwise have collected. This is the danger of using technological devices with clients in nursing

care because nurses can be lured by technology's promise focus on the device rather than the client and the client's emotional needs are overlooked. Importantly, the clients can be reduced to objects that are manipulated by health professionals (Sandelowski 1986; Erlen 1994; Waters 1995). Technological dependency does expand nurses practice, authority and power because new knowledge is developed and complex skills in manipulating technological devices are acquired, but technology can also limit nurses' skills and abilities. Deskilling occurs as nurses are abandoned or lose old skills in favour of the newly acquired skills necessary to operate devices and interpret the data obtained from new technological devices (Sandelowski 1993). Julie's response suggests that she is caught between the power of technology dependency and the essence of nursing, focusing on the client and caring for the client and using her own nursing knowledge and skills.

Technological device use in nursing care

When the women were asked about incorporating devices into a clients nursing care the desire to ensure clients safety was expressed and caused them to focus primarily on the technological device rather than the client. Yu explained "When I used the glucometer I was concentrating on what I was doing making sure I was doing the right thing and sometimes, I try to communicate as well. It gets easier once you know what you are doing." Kelly, when explaining how she initially provided nursing care when using technological devices said "I would be around them [the clients] a lot, checking for everything, and I might be a little preoccupied. ...". A desire to care for clients safely was expressed by them all, and most expressed anxiety and nervousness when incorporating technological devices into client care for the first time. Jane explained "I was more concerned that I would do something [harm] to the patient." The women's responses again highlight the complexity involved in providing nursing care to clients. The nurse must be able to meet the emotional, physical and technical aspects of nursing care in a safe and effective manner that requires prioritising of those elements.

The impact of technology on client care and the role of the nurse is significant (McConnell 1990; Pelleteir 1992; McConnell 1996). The nurse must focus on the client to ensure client well-being while operating the technological device and ensuring the technology is functioning correctly. The nurse is also the link between the client and the technological device because she/he collects the data, interprets and makes appropriate clinical judgements based on the evidence gathered. The majority of these women all stated that over time they were more able to balance the interaction between the clients and technological devices but in the first instance the focus was on the device

rather than the client. Kelly, Rae, Julie, Bev and Yu all stated that as they became more experienced they became more confident and then they were able to spend time explaining to clients about the technological devices that were being used in their nursing care. For example Bev said "The more experienced I became the greater the quality of care I could give to my clients. I could spend quality time with them.". These responses confirm Ray's contention(1987) that technical competence is achieved when a nurse is comfortable with the technology and can concentrate on the client and the family. The responses of Kelly, Rae, Julie, Bev and Yu suggest that they are becoming technologically competent.

The women believed that other commonly used devices such as blood pressure and cardiac monitors assisted in accurately monitoring the physiological status of the client. They used the term "more accurate" to describe the benefit of these devices in nursing work. Rae said "It makes things easier and they are a benefit to both you [the nurse] and the patient. You have a more accurate way of assessing progress." Jane also explained that "It helps in learning more about the patient's status." However the women were also aware of the limitations of technological devices and all stated that devices could be inaccurate and/or malfunction. Yu explained "You can't trust devices implicitly but you still use the device." The majority of women also spoke of the nurse's role in assessing the information and applying nursing knowledge in making clinical judgements. Kelly explained "You should be able to anticipate what the expected outcome would be, so if the machine says something different to what you work out then you should be able to work out which is correct and what has caused the problem." Kelly's responses supports Drought & Liaschenko's (1995) view that nurses must be knowledgeable about technological devices and their actual capabilities and functions.

The women also spoke about their ability and proficiency of technological device use and of their understanding of accountability in relation to its use in client care. Kelly said "You had to know what you were doing before you walked into their [client's] room. ... You are accountable" Jane said of her first use of a device "I don't want to make a mistake so can you please come with me and watch me operate the device." Others stated that if the machine gave a reading which they thought was inaccurate their first thought was that they had, either not programmed the technological device accurately, or had incorrectly applied the recording mechanism. The women then examined the device to see if they had attached the measuring or recording attachments appropriately to client before considering the possibility that the device might have malfunctioned. These statements confirm Reiser's view cited in Erlen (1994:51) that 'Machines can seem so accurate, so right. They can make us forget who made them,

and who designed them ... they can make us forget ourselves.' The women's responses also illustrate their developing ability to manage and manipulate technological devices within the parameters of providing of nursing care to clients.

Other benefits from the use of technological devices in nursing care were identified. The women chose words such as "easier" "time saving" "efficient" to describe the value of technological devices. They believed that the powered devices were time saving because they relieved them of some of the tedious and constant monitoring which is required with devices such as the manually regulated intravenous infusion set. For example Kelly replied, "With the intravenous pump you don't have to keep racing back in [to the client's room] every ten minutes to make sure the line is running because the person has their arm at the wrong angle. You still have to check them but theoretically it should give you more leeway." Some of the women stated that the time which was saved through the technological device use was used to talk about the device to the clients for whom they were providing nursing care. "It is better to explain the device to the patient so they don't get scared from the device." explained Chin. Therefore the women interviewed in this study believed that technological devices contributed to more effective client care and saved them time when caring for clients.

The capacity of technological devices to either save or not save a nurse time and to change the nature of nursing work is a theme identified in the literature. Research by Koh & Thomas (1994) found that time is saved when using infusion pumps to administer medications versus intramuscular injections of analgesics. Conversely, Holmes (1990) and Larrivee & Joseph (1992) assert that time is not saved because the nurse is actually required to consider a greater amount of data in the same time frame. Marles (1988) and Sandelowski (1993) contend that the increase in use of technological devices has changed nurses' workloads as well as changing the nature of nursing. In addition, Hickson (1992) asserts that technology will 1) free nurses from mediocre tasks; 2) provide accurate physiological data through monitoring to determine a client's status; 3) when incorporated appropriately into nursing care support a client's nursing needs; 4) improve the organisational of client management systems. The women in this study support these statements that technology benefits nursing and client care .

These women have used technology and technological devices as part of their nursing practice. For them the practice of nursing has not changed. The acquisition of knowledge and application of skills required to manipulate and operate technology has been facilitated through an educational program which has allowed them to experiment and operate technological devices in a safe environment prior to using it with clients.

Reinforcement and positive constructive criticism has been given which has developed their confidence. These women from their own experience have identified the benefits of technological device use in client care. While the women were apprehensive when first using the technological devices with clients they held the belief that they were able to incorporate the device into client care with safety and proficiency. However, the newness of the nurses to nursing does not permit their responses to be examined to determine their perceptions of the changes that technology effects on work practices, or the changes to the social construction of nursing, nor allow the exploration of their perceptions of the ethical dimensions associated with technological device use in nursing.

Effects of the socially constructed conventional role of the nurse on student nurses.

Analysis of the women's responses highlight differences in the women's perception of the role of the nurse and nursing practice. The image of nurses and nursing work was identified by Leonie and Julie as being incongruous with reality. Julie explained that "I think nursing work is not valued ... you have to work really hard... people's view of nursing is quite old fashioned, they see nurses as caring women who sit by the bedside and look after the patient." In addition, Leonie explained "So many people say to me why did you go to Uni [university] to do nursing? So much of that has to do with the doctors because they portray that attitude to the patient when they say get me this, get me that. The patient sees it like that and then they think the nurse is just a lackey. We just don't have any control. I don't like that." Kelly concurs with this statement but from a viewpoint which accepts the conventional role of the nurse and explains "a nurse should be willing to accept instructions from other people or criticisms. ..."

Julie's, Leonie's and Kelly's responses reflect the subordination of nurses in health care. Julie expresses the dissatisfaction that some nurses experience in the relationship between the public, medical officers and the themselves. Stein, Watts & Howell (1990:346) assert that the relationship between nurses and medical officers is important and is based on 'respect and interdependence steeped in history and stereotyped in popular culture.' Leduc cited in Allen (1987:50) supports this view and suggests that the archetypical portrayal of nurses to the public is as 'temperature takers with small brains and big hearts.' In addition Jecker and Self (1991) contend that the patients perception of the role of the nurse will exert influence over health professionals' perceptions, and these perceptions and attitudes will reinforce and strengthen conventional gender roles and oppose the efforts of nurses to re-design and alter their

nursing role. Dissatisfaction and disillusionment with nursing as a career because of role conflict will cause some nurses to leave nursing and seek employment elsewhere. Leonie is actively seeking further studies in a new discipline in an endeavour to find a career with greater autonomy in practice.

While Leonie's response reveals the subordination of nurses to medical officers and the image of nurses as hand-maidens, other factors further compound the feelings of little or no control over situations within health care institutions. Allen (1987) asserts that nurses employed in health care institutions do not control decision making processes concerning their work. Health care administrators and medical officers control the work processes. Also fees for nurse's services are not costed separately to nursing care costs. Indeed nurses employed in health care institutions do not control their working conditions, their fees, their work load or their shifts. Health care is a labour intensive industry and is under constant pressure to reduce costs. At present the nursing workforce is being reduced by health care administrators to decrease health care costs. The effect of this workforce reduction is to increase the number of clients that a nurse will care for per shift, and increase the number of people who have little or no nursing education employed to assist the nurse in providing care to clients.

In Australia, over ninety percent of nurses are women (Speedy 1987). The number of women who are nurses reflects the employment pattern of women in caring professions in western society. That is because caring and emotional labour in western society is conventionally regarded as work for which women have a natural ability. Women's ability to care is not valued, is often not paid work and is sustained as work in the private sphere of the home. As a result the social construction of care and emotional labour becomes gendered in meaning and women's position of difference is maintained.

The essential element of nursing is generally regarded by western society as care and that care is largely provided by women who are nurses. The image of nursing is therefore shaped and socio-culturally constructed by society. Nursing then assumes the attributes of women and women's position in the world and nursing's image becomes one of subservience and powerlessness. The power of medicine over nursing has been socially constructed over time through social processes and is maintained by hierarchical authority. This power and status of medicine over nursing has also influenced the historical development of nursing. Further, the majority of medical officers are male and the majority of nurses are female and the conventional male role is typified by dominant behaviour while the conventional female role is typified by passiveness and subordination to male dominant behaviour. As well, the hierarchical

authority wielded by the administrators of health care institutions has continued to perpetuate nurses' subordination and oppression through systems of power and control. In spite of the importance of emotional work in nursing, the management's of health care institutions do not usually value emotional work and do not calculate time and costs of nurses needed to perform this work into nursing costs. Emotional work is therefore unacknowledged and unrewarded in nursing. This has, in part, maintained the social construction of conventionally portrayed gender roles of women and their oppression in both nursing and society (Tellis-Nayak M and Tellis-Nayak V 1984; Allen 1987; Carpenter 1993).

In addition, Allen asserts that the socialisation of conventional gender roles and behaviour is reinforced through educational opportunities provided in nursing programs. Further, the fact that nursing education is valuing the emotional work of nurses and the areas of work that are uniquely nursing will cause nurses to question their role and actions as nurses and cause stress if there is incongruence between values held and the realities of the social construction of the workplace.

The gendering of nursing is therefore a crucial factor in the history of nursing. Feminism provides nurses with insight into the social constructions of nursing that maintain its subordination to medicine as well as insight into the traditional role of the nurse in terms of family roles and patriarchy. Feminism also provides nurses with an approach that they may use in the change process as nurses struggle to gain autonomy, accountability and control of their profession. The future of nursing is therefore tied to the emancipation of women (Short & Sharman 1987; Bent 1993).

The Way Forward

This chapter discusses the experiences of the women and the interrelated themes of technology, education and nursing praxis through a feminist lens.

Chapter 8

The results of this study involving eight women are important. The study determined how the women felt about and learnt to use technological devices in an undergraduate nursing program. Further, by using a feminist perspective, the contemporary issues which affect the way in which women perceive technology and learn to use technological devices were identified. In addition, the women's perceptions of nursing and the value of technological device use in nursing, enrich the findings of the study.

Implications of social construction of gender

The results indicated that the way masculinity and femininity were understood and practised within their families of origin did influence the women's perceptions of technology. The majority of these women had perceptions of femininity and masculinity and socially constructed conventional gender roles which reflected the dominant role of males in western society. In particular, there was the perception that within western society, males are seen as being more technologically competent than women and that the technical knowledge and physical ability to use technology gives to those who use it, a degree of power. Also in this study, unless prompted, women did not acknowledge women's abilities to use technology. Therefore, women's ability to use and manage technology within the home was devalued, trivialised and unacknowledged and thus rendered invisible and of little consequence. Technological skills are therefore defined as male property and are both a cause and effect of male supremacy and in part maintain women's continued subordination and oppression in society.

The women's perceptions affected how they felt about technological devices. The perceptions affected the way in which each of them approached technology as well as their feelings of confidence when they learnt technological device use in the home. Some women said that they felt more confident than others when approaching and using different domestic technological devices. Therefore, these women bring to the undergraduate nursing program a variety of perceptions about conventional gender

roles and various feelings about their own abilities to learn and use technological devices.

The assumptions and perceptions that women bring with them when entering an undergraduate nursing program must be considered. Their perceptions of femininity, masculinity and feelings about technology have the potential to affect the women's ability to approach and interact with technological devices when learning to use and incorporating them into nursing care. Also, the perception that technology represents male power may further impact on nurses when considering a technological device's suitability for use with clients and/or suitability for purchase.

The challenge then, is for nurse teachers to ensure that the focus is on the social constructions which surround technology and its use, before focusing on proficient technological device operation. Sandelowski (1988) cited in Waters (1995) asserts that students of nursing are insufficiently prepared and unaware of the conceptual systems surrounding technology when they incorporate technological device use into nursing practice. Missing is the critical thought to the social-cultural parameters which surrounds technology and its application. In addition, Waters (1995) contends that literature which explores the philosophy of technology offers nurses a way of interpreting the dominant view of technology which has given to technology its constructed meaning of power. Nurses who acknowledge that nursing is practised within a technologically influenced material world will be better able to develop an understanding of the social implications of the technology they use (Waters 1995). It is, therefore, important that nurse teachers consider specific curriculum content and teaching strategies which will provide the opportunity for student nurses to explore the social constructions of conventional gender roles as well as the notion of technology as a masculine culture. Also included within the nursing curriculum should be provision for discussion on the contemporary ethical debates that focus on determining when technology use in society is influenced from a technological imperative or a technological determinism viewpoint.

Importance of the learning environment

The women entering the undergraduate nursing program come with a range of experiences and perceptions about technology and their own ability to use technological devices. It is imperative that student nurses are facilitated in their learning to become proficient and competent device users. This requires that nurse teachers consider the learning environment as well as appropriate content and teaching

strategies. The women in this study believed that their ability to use technological devices was facilitated by the safe and supportive environment which was created in the nursing skills laboratory. Discovery or experimental learning in small groups with teachers acting as facilitators, not demonstrators, enhanced students' feelings of confidence and learning. The women also viewed the positive feedback received from both peers and teachers about their ability to manipulate devices as an important component of the learning process. Furthermore, the availability of the Laboratory for practice outside of scheduled class times was appreciated and contributed to the learning process. Therefore, the importance of the learning environment and the school's underpinning learning culture is emphasised.

All the women identified that there was insufficient time available to practice using technological devices within the scheduled class times. This factor requires nurse teachers to consider the time allowance when devising learning experiences. Sufficient time needs to be allocated to ensure that women are able to learn device function in a safe supportive environment so that the women become technically competent and confident in their abilities. Time allocation to ensure that learning experiences are successfully completed is a significant factor for nurse teachers to consider when developing learning activities, teaching strategies and programs.

Importantly the women viewed learning as a continuum that began with lectures, tutorial and nursing skill laboratory practicals and continued into clinical areas. The women did not view learning as complete until safe technological device use was incorporated into client care a number of times. All women were nervous when first incorporating technological device use into the clinical nursing area because the student nurse's prime concern was client safety. The women believed that the more often they used technological devices in client care the more confident they became. It is therefore essential that expert teachers are present in the clinical area to support the women as they complete the learning process of incorporating technological device use into nursing care.

Empowerment through education

The infusion pump was identified as the most stressful technological device and the alarm noise of the infusion pump the most frequent cause of stress. The number of devices used on behalf of one patient and the differing models of the same technological device were also causes of stress. The issue here for teachers, is that a student nurses require an educational program that prepares them for a career

characterised by constant change in knowledge associated with providing nursing care involving procedures, skills and technology. The concept of life long learning needs to be promoted. Learning opportunities which promote the ability to think critically, reject rituals and pro-actively seek information and knowledge are required. The nurse also needs the ability to recognise when to discard old out-moded techniques and attitudes. This is the challenge for nurse teachers.

The experiences of the women interviewed indicated that the learning opportunities provided, such as discovery learning with teachers who were facilitators have assisted some of the women to become self-directed learners. However, some women were still in the transition phase from teacher-directed learner to self-directed learner. Teachers need to consider that learning in secondary school is different from learning in university and that students will need assistance to make the transition. Feminist teaching strategies which acknowledge both objective and subjective knowledge, past learning experiences, critical inquiry, reflection and facilitate women through Bleney's(1986) five stages of women's ways to 'connected knowing' will facilitate women's empowerment and will facilitate the transition process to self-directed learner.

The influence of past learning experiences embodied within the family context, and educational processes often in patriarchal, hierarchical institutions also influenced these women's perceptions of nursing and nursing work. Conflicts between the women's perception of the role of the nurse and the perception held by clients and other health professionals were identified. The subordination of nurses to medicine was highlighted as were career conflicts due to the inability to exert control or practice autonomously. Hagel (1989) contends that Feminist theory should be incorporated into nursing education programs because it would assist nursing to become a political education, in the sense that it would highlight the power relations that exist in western society and within the health care institutions. Further, once the power relations are understood and recognised by nurses they will be able to challenge the existing system.

In addition, Sohler (1992:62) asserts that nurses and nursing are capable of finding solutions to the patriarchal powers which restrain nursing's further development. Creative solutions can be found through 'a process that acknowledges and embraces feminist logic and abandons the patriarchal structures of knowledge and power that dominate western health care.' Therefore, the nurse teacher's challenge is to raise the consciousness of nurses. Nurses must also strive to acknowledge the value, worth and power of each nurse. The 'silenced voices' must be heard!

Further study areas

The women identified the essential element of nursing as the nurse's ability to provide skilled nursing care that would holistically meet the needs of clients. Nursing care was seen as providing both physical and emotional care to clients. The majority of women believed that over time they were more able to balance the interaction between the client and the technological device, but in the first instance the focus was on the device rather than the client. As learning progressed they focused more on the client and felt that they were more able to talk with clients and provide safe nursing care. Therefore, the women's responses highlighted the complexities involved in providing nursing care to clients which required them to meet the emotional, physical and technical aspects of nursing care safely and effectively. The complexities of how a woman is able to competently incorporate device use into nursing care, meet the emotional and physical needs of clients in the first year after completing an undergraduate nursing program is an area for further study.

There was also an indication in this study that the portrayal of conventional gender roles of women and men by the media did contribute to the social construction of the women's perceptions of technology. However, the women were more questioning of the media's portrayed views and did not always believe that the views portrayed were accurate. It is disturbing that in spite of affirmative action policies and programs that the women believed that generally conventional gender roles were still being portrayed by the media. This is of particular concern because the images portrayed in texts, books and the media have been identified as an effective way to discourage conventional gender roles (Byrne 1984). In addition, Byrne asserts that young women will more readily accept the belief that they can achieve when men transmit the message, than when women convey this message. Effecting social change is difficult and does not occur quickly. A study to determine the way in which technological device use by nurses and medical officers is portrayed by the media and whether or not this influences the social construction of the women's and men's perceptions of conventional roles of nurses and medical officers should be considered. Such a study would provide further information to challenge the status quo of women and nurses.

Limitations

Eight women responded to the initial or second invitation to participate in this study. A limitation of this study is no men were interviewed. The sample is not representative of the cohort of graduates from an undergraduate nursing program at this South Australian School of Nursing.

Additionally, the sample is small therefore, the women's experiences may not be representative of all women graduating from an undergraduate nursing program because each woman is unique, made so by her life's experiences within her family, the educational institutions attended and the social-cultural constructions of the world in which she lives.

Conclusion: A Feminist Project

This study has identified important areas that require emancipatory action if women's subordination and oppression is to be seriously challenged and the status quo changed.

Chapter 9

This is a pioneering study because it foregrounds women's learning experiences with technological devices in an undergraduate nursing program. Further, the research findings make a significant contribution to both feminist and nursing literature because there is a paucity of literature in either of these fields which examines the effects of socio-cultural construction of conventional gender roles on how woman feel about and learn to use technological devices. This study confirms that women do enter the undergraduate nursing program with socio-culturally constructed view of conventional gender roles which has the potential to adversely affect women's ability to learn and interact with a technological device. Importantly, these women are confident in their own abilities to operate technological devices as an adjunct to client care at the conclusion of the undergraduate nursing program .

The feminist methodology utilised allowed the researcher to value the subjective experiences of the women. An important premise of Feminist research is that the research should have mutual benefit for the participant and the researcher. These women expressed the benefit of sharing their experiences, because they wanted to share the benefits that the undergraduate nursing program had provided them.. Also they particularly wished that other women students would benefit from the contribution they were making to research program. Further, the exploration of social constructions of conventional gender roles between the women and the researcher enabled some women to understand the world from a new and relevant perspective.

This study is important because it explores not only how women feel and learnt to use technological devices but it challenges the assertions made in the literature that technological device knowledge is acquired after the initial qualification is obtained. Further it identifies curriculum content on the philosophy of technology which would ensure that nurses are knowledgeable of the contemporary debates related to philosophical and ethical concerns of technology development and affect on work practices.

The research findings indicated that these women's learning was enhanced through the use of the teaching methodologies which are utilised in this School of Nursing. Furthermore, the learning activities facilitated some women from teacher-directed learners to self-directed adult learners, thus empowering them. The study identified factors which facilitate, increase or hinder women's learning which require nurse teachers consideration when curriculum planning and/or developing teaching strategies for undergraduate nursing programs. Importantly, the women's responses contribute to the understanding of women's learning experiences, perceptions of nursing and the value of technological devices use in nursing practice.

Their 'silent voices' have been heard.

BIBLIOGRAPHY

- Ackermann W 1982 Technology and nursing education: a scenario for 1990. *Journal of Advanced Nursing* 1982(7):59-68
- Adams C 1988 Doctoral preparation for nurse-midwives. *Journal of Nurse-Midwifery* 33(3):141-143
- Alexander J, Mark B 1990 Technology and structure of nursing organisations. *Nursing & Health Care* 11(4):195-199
- Allan J, Hall B 1988 Challenging the focus on technology: a critique of the medical model in a changing health care system. *Advances in Nursing Science* 10(3):22-34
- Allen A, Wiggins O 1977 The Feminist critique of self and society: a phenomenological metacritique. In Hillman J, Renault G (eds) *Catalyst Issue* 1977(10-11):37-59
- Allen D 1987 Professionalism, occupational segregation by gender and control of nursing. The politics of professionalism, opportunity, employment, and gender. Hawthorn, Wisconsin.
- Allen D, Allman K, Powers P 1991 Feminist nursing research without gender. *Advances in Nursing Science* 13(3):49-58
- Andrews M, Jones P 1996 Problem-based learning in an undergraduate nursing programme: a case study. *Journal of Advanced Nursing* 1996(23):357-365
- Ashley J 1980 Power in structured misogyny: implications for the politics of care. *Advances in Nursing Science* 2(3):3-21
- Ashworth P, Morrison P 1989 Some ambiguities of the student's role in undergraduate nurse training. *Journal of Advanced Nursing* 1989(14):1009-1015
- Audet M 1995 Caring in nurse education: reducing anxiety in the clinical setting. *Nursing Connections* 8(3):21-29
- Australian Nursing Federation (South Australian Branch) 1991 *Technology and Nursing Policy Statement*, Adelaide
- Australian Standard 1993 *Guide to safe use of infusion pumps and controllers*. Australian Capital Territory, Canberra
- Ausubel D 1968 *Educational psychology: a cognitive view*. Holt, Rinehart and Winston, New York
- Aydelotte M 1992 Nursing education: shaping the future. In Aiken I, Fagin C (eds) *Charting nursing's future agenda for the 1990's*. Lippincott, Philadelphia
- Baker C, Wuest E, Stern P 1992 Method slurring: the grounded theory/phenomenology example. *Journal of Advanced Nursing* 1992(17):1355-1360
- Banta H, Luce B 1993 *Health care technology and its assessment: an international perspective*. Oxford Medical, Oxford
- Bates E, Lapsley H 1985 *The health machine: the impact of technology*. Penguin Books, Sydney

- Battista R, Hodge M 1995 The development of health care technology assessment. *International Journal of Technology Assessment in Health Care* 11(2):287-300
- Beaumont E 1993 IV infusion pumps. *Nursing Management* 18(9):26-32
- Beaumont E 1995 Technology scorecard: what's right for you. *American Journal of Nursing* December 1995:36-41
- Beery T 1995 Diagnosis and treatment of cardiac disease: gender bias in the diagnosis and treatment of coronary artery disease. *Heart & Lung* 24(6):427-435
- Benner P 1984 *From novice to expert: excellence and power in clinical nursing practice*. Addison-Wesley, San Francisco
- Bent K 1993 Perspectives on critical and feminist theory in developing nursing praxis. *Journal of Professional Nursing* 9(5):296-303
- Bevis E O 1973 *Curriculum building in nursing: a process*. CV Mosby, Saint Louis.
- Bevis E, Watson J 1989 *Toward a caring curriculum: A new pedagogy for nursing*. National League for Nursing, New York.
- Bland Jones C, Alexander J 1993 The technology of caring: a synthesis of technology and caring for nursing administration. *Nursing Administration Quarterly* 17(2):11-20
- Bleneky M, Clinchy B, Goldberg N, Tarule J 1986 *Women's way's of knowing: the development of self voice and mind*. Basic Books, New York
- Bogner M 1995 Human factors and medical devices: lack of device feedback. *User: Food and Drug Administration Facility Reporting* 1995(14):1&6-8
- Boughn S 1992 Nursing students rank high in autonomy at the exit level. *Journal of Nurse Education* 1992(2):58-64.
- Bough S, Wang H 1994 Introducing a feminist perspective to nursing curricula: a qualitative study. *Journal of Nursing Education* 33(3):112-117
- Boxtel A, Napholz L, Gnewikow D 1995 Using a wheelchair activity as a learning experience for student nurses. *Rehabilitation Nursing* 20(5):265-267
- Braun J, Baines S, Olsen N, Scruby L, Manteuffel C, Cretilli P 1984 The future of nursing: combining humanistic and technological values. *Health Values: Achieving High Level Wellness* 8(3):12-15
- Brewer A 1983 *Nurse, nursing and new technology: implications of a dynamic technological environment*. University of New South Wales, Sydney
- Broadbent A. 1991 *Higher Education Series: Report on Nursing Students*. Report No.12, Department Employment and Education.
- Brown J 1992 Nurses or technicians? The impact of technology on oncology nursing. *Canadian Oncology Nurses Journal* January 1992:12-17
- Burnard P 1990 The student experience: adult learning and mentorship revisited. *Nurse Education Today* 1990(10):349-354

- Burns N, Grove S.K 1987 *The practice of nursing research: conduct, critique and utilization*. W.B. Saunders, Philadelphia:45-106
- Bush C 1983 *Women and the technology assessment: to think to be, to be, to unthink to free*. In Rothschild J *Machina Ex Dea*. Pergamon Press, Oxford
- Butler J, Alavi C, Bartlett L, Beasley W, Fox-Young S, Kerven B, Maxwell G, Sadler R, Wilkes R 1990 *ANRAC Nursing Assessment Project: Report to the Australasian Nurse Registering Authorities*. Assessment and Evaluation Research Unit Education Department, The University of Queensland.
- Butts R 1964 *Assumptions underlying Australian education*. Australian Council for Educational Research, Melbourne
- Byrne E 1984 *Women in the labour force*. Monograph No 4 Australian Government Printing Service, Canberra
- Byrne E 1985 *A comparative overview of new initiatives*. Monograph No 11. Australian Government Publishing Service, Canberra
- Byrne E 1993 *Women and science: the 'snark' syndrome*. The Falmer Press, London
- Cail B 1993 *Introducing information technology to grandmother*. In Goldsworthy A, Meredith H (eds) *Technological change: women in technology, impact of information technology 1993*. National Information Technology Council Inc, Microdata, Canberra: Ch 3
- Callahan L, Healey T 1992 *On following the god of technology*. *CFNA: the Clinical Forum for Nurse Anaesthetists* 3(3):93-94
- Campbell J, Bunting S 1991 *Voices and paradigms: perspectives on critical and feminist theory in nursing*. *Advances in Nursing Science* 13(3):1-15
- Carnevale F 1991 *High technology and humanity in intensive care: finding a balance*. *Intensive Care Nursing* 1991(7):23-27
- Carnevali D 1985 *Nursing perspectives in health care technology*. *Nursing Administration Quarterly* 9(4):10-18
- Carpenter M 1993 *Other health professionals. The subordination of nurses in health care: towards a social divisions approach*. In Riska E, Wegar K (eds) *Gender, Work and Medicine*. Sage, London: Ch 5
- Carryer J 1995 *Feminist research: strengths and challenges*. *Contemporary Nurse* 4(4):180-186
- Carter H 1994 *Confronting patriarchal attitudes in the fight for professional recognition*. *Journal of Advanced Nursing* 1994(19):367-372
- Cassata R 1993 *The evolution of high-tech nursing*. *The American Nurse* Nov/December 1993:18-20
- Catlin A, Wetzel W 1991 *Ectopic pregnancy: clinical evaluation, diagnostic measures and prevention*. *Nurse Practitioner* 16(1):38-46
- Cheek J, Rudge T 1994 *Been there, done that? Consciousness raising, critical theory and nurses*. *Contemporary Nurse* 3(2):58-63

- Chinn P, Wheeler C 1985 Feminism and nursing. *Nursing Outlook* 33(2):74-77
- Chin P 1989 Nursing patterns of knowing and feminist thought. *Nursing & Health Care* 10(2):71-75
- Chivers G 1987 Information technology-girls and education: a cross-cultural review. In Davidson M Cooper G, Cary L (eds) *Women and information technology*. Wiley, Great Britain: Ch 3
- Clarke L 1992 Qualitative research: meaning and language. *Journal of Advanced Nursing* 1992 (17): 243-252
- Clarke L 1995 Nursing research: science, visions and telling stories. *Journal of Advanced Nursing* 1995(21):584-593
- Cockburn C 1983 *Brothers: Male dominance and technological change*. St Edmundsbury Press, Suffolk
- Cockburn C 1988 *Machinery of dominance. Women, men and technical knowhow*. Northeastern University Press, Boston
- Cockburn C 1992 Technological change in a changing Europe. Does it mean the same for men? *Women's Studies International Forum* 15(1):85-90
- Cohen J 1993 Caring perspectives in nursing education: liberation, transformation and meaning. *Journal of Advanced Nursing* 1993(18):621-626
- Cohen M, Davis N 1993 Recognising the dangers of free flow from an electronic infusion device. *Nursing* 93 23(6):56-59
- Colliere M 1986 Invisible care and invisible women as health care-providers. *International Journal of Nursing Studies* 23(2):95-112
- Collyer F 1996 Medical technology. In Grbich (ed) *Health in Australia: sociological concepts and issues*. Prentice Hall, Philadelphia: Ch 11
- Condon E 1992 Nursing and the caring metaphor: gender and political influences on an ethics of care. *Nursing Outlook* 40(1):14-19
- Connell W F 1974 *The foundations of education*. Ian Novak, Sydney
- Cooper M 1993 The intersection of technology and care in the ICU. *Advances in Nursing Science* 15(3):23-32
- Corley M, Selig P 1992 Nurse moral reasoning using the nursing dilemma test. *Western Journal of Nursing Research* 14(3):380-388
- Cosgrove S 1982 The nurse's contribution to the humanisation of health services in the presence of increasing technology. *The New Zealand Nursing Journal* 75(11):12-13
- Couts-Jarman J 1993 Using reflection and experience in nurse education. *British Journal of Nursing* 2(1):77-80
- Crawley W, Marshall R, Till A 1993 Use of un-licensed assistive staff. *Orthopaedic Nursing* 12(6):47-53

- Curtis S, Boulwood M 1961 A short history of educational ideas. University Tutorial Press, Foxton
- Dall'Alba G, Sandberg J 1993 A competency-based approach to education and training: will it improve competence? *HERDSA News* 15(1):3-5
- Dassen T, Nijhuis F, Philisen H 1990 Male and female nurses in intensive-care wards in the Netherlands. *Journal of Advanced Nursing* 1990(15):387-393
- Davidson M, Cooper G, Cary L (eds) 1987 *Women and information technology*. Wiley, Great Britain
- Davis, Bryn, D 1990 How nurses learn and how to improve the learning environment. *Nurse Education Today* 1990 (10):405-409
- Delpit L 1988 The silenced dialogue: power and pedagogy in educating other people's children. *Harvard Educational Review* 58(3):280-298
- Delpit L 1992 Acquisition of literate discourse: bowing before the master. *Theory into Practice* 31(4):296-302
- DeLuca E 1995 Reconsidering rituals: a vehicle for educational change. *The Journal of Continuing Education in Nursing* 26(3):139-144
- DeMarco R 1993 Mentorship: a feminist critique of current research. *Journal of Advanced Nursing* 1993(18):1242-1250
- Denny E 1991 Feminist research methods in nursing. *Senior Nurse* 11(6):38-40
- Denzin N, Lincoln Y(eds) 1994 *Handbook of Qualitative Research*. Sage, London
- Dewey J 1963 *Democracy and Education*. Macmillan Co, New York
- Doering L 1992 Power and knowledge in nursing: a feminist poststructuralist view. *Advances in Nursing Science*. 14(4):24-33
- Dreikers R 1968 *Psychology in the classroom: a manual for teachers*. Harper & Row, New York
- Dressler D 1989 Introducing new technology in the critical care unit. *The Joint Commission Plant, Technology and Safety Management Series No 1*:31-35
- Drought T, Liaschenko J 1995 Ethical practice in a technological age. *Critical Care Nursing Clinics of North America* 7(2):297-304
- Dux C 1989 An investigation into whether nurse teachers take into account the individual learning styles of their students when formulating teaching strategies. *Nurse Education Today* 1989 (9): 186-191.
- Earley P.1985 Girls, school and work: technological change and female entry into non-traditional work areas. In Towns D (ed) *The responsibility to educate girls for a technologically orientated society*. Deakin University Press, Melbourne: Ch1.
- Eckert P 1989 Understanding the impact of gender on behaviour. *School Discipline: the management of student behaviour*. Education Department of South Australia
- Eisenstein H 1984 *Contemporary feminist thought*. Allen & Unwin, Sydney

- Endacott R 1994 Objectivity in observation. *Nurse Researcher* 2(2):30-40
- Engler M, Engler M 1986 Comparative evaluation of intravenous therapy regulating devices. *Heart & Lung* 15(3):262-267
- Erlen J 1994 Technology's seductive power. *Orthopaedic Nursing* 13(6):50-66
- Ermert C 1991 The re-use of single use medical devices- the hospital administrators viewpoint. *Austalian Confederation of Operating Room Nurses Journal* September/October 1991:20-24
- Fay M 1989 Operating room controls: liability and responsibility. *Today's OR Nurse* 11(6):10-16
- Feeg V 1990 Ask nurses about medical devices. *Paediatric Nursing* 16(2): 120&143
- Fell L 1985 Postscript: women in the media. In Rigg J, Copeland J (eds) *Coming out: women's voices, women's lives*. Nelson Pub, Melbourne
- Field P 1989 Implementing change in nurse education. *Nurse Education Today* 1989(9):290-299
- Field P 1989 Implementing change in nursing education. *Nurse Education Today* 1989(9):290-299
- Finlayson M, Havixbeck K 1992 A post-discharge study on the use of assistive devices. *Clinical Journal Occupational Therapy* 59(4):201-207
- Finnick M, Haughey B 1992 Evaluating quantitative research problems. *Critical Care Nurse* 1992 (6):98-105
- Ford J 1990 Computers and nursing: possibilities for transforming nursing. *Computers in Nursing* 8(4):160-164
- French P, Anderson J, Burnard P, Holmes C, Wong T, Chang M 1993 Looking to the future: international perspectives on nurse education. *Asian Journal Nursing Studies* 1993(1):67-73
- Fry A, Mortimer K, Ramsay L 1994 Clinical research and the culture of collaboration. *The Australian Journal of Advanced Nursing* 11(3):18-25
- Game A, Pringle R 1983 *Gender at work*. George Allen Unwin, Sydney.
- Gaze H, Cottingham M 1987 Men in nursing. *Nursing Times* 83(20):24-27
- Gennaro S, Klein A, Miranda L 1992 Health policy dilemmas related to high technology infertility services. *Image: Journal of Nursing Scholarship* 24(3):191-194
- George V D, Boruch R F 1989 Medical device reporting: a pilot study of nurses. *American Operating Room Nurses Journal* 49(3):815-827.
- Gifford S, Braum F, Encel S 1995 Ethical aspects of qualitative methods in health research: an information paper for institutional ethics committees. Report, Australian Health Ethics Committee NHMRC, Canberra
- Giuffra M 1980 Humanistic nursing in a technological society. *Journal NYSNA* 11(1):17-20

- Goble I 1981 Educating the professional nurse of tomorrow... today. *Nursing Times* April 23 1981:746-748
- Goldworthy A, Meredith H (eds) 1993 *Technological change: women in technology: Impact of Information Technology* 1993. National Information Technology Council Microdata Pub. Canberra
- Golonka L 1986 Trends in health care and use of technology by nurses. *Medical Instrumentation* 20(1):8-10
- Gorelick S 1991 Contradictions of feminist methodology. *Gender and Society* 5(4):459-477
- Grant A 1993 Questions of life and death. *Canadian Nurse*. May 1993:31-34
- Gray P 1995 A journey into feminist pedagogy. *Journal of Nursing Education* 34(2):77-81
- Green L, Guinery R 1994 *Framing technology: society, choice and change*. Allen & Unwin, Australia
- Greenleaf N 1980 Sex-segregated occupations: relevance for nursing. *Advances in Nursing Science* 2(3):23-37
- Gunew S 1990 *Feminist knowledge: critique and construct*. Routledge, London
- Haberman M 1991 The pedagogy of poverty versus good teaching. *Phi Delta Kappan* December 1991:290-294
- Hagell E 1989 Nursing knowledge: women's knowledge. A sociological perspective. *Journal of Advanced Nursing*. 1989 (14):226-233
- Halberstam J 1991 Automating gender: postmodern feminism in the age of the intelligent machine. *Feminist Studies* 17(3):439-460
- Hall J, Stevens P 1991 Rigour in feminist research. *Advances in Nursing Science* 13(3):16-29
- Hansen G 1993 Refocusing the skills laboratory. *Nurse Educator* 18(2):10-12
- Haraway D 1987 A manifesto for cyborgs: science, technology and socialist feminism in the 1980's. *Australian Feminist Studies* 1987(1):1-42
- Hardie L 1983 Men in nursing: Unequal opportunity. *Nursing Times* 83(22):45-47
- Harding I 1994 Gender gap. *Nursing Standard* 8(39):39
- Hartsock N 1983 The feminist standpoint: developing the ground for a specifically feminist historical materialism. In Harding S, Hintiks M (eds) *Discovering reality: feminist perspectives on epistemology, metaphysics, methodology and philosophy of science*. B Reidell Company, Boston :283-310
- Harvey T, Vaughan J 1990 Student nurse attitudes towards different teaching/learning methods. *Nurse Education Today* 1990(10):181-185
- Heinrich K, Witt B 1993 The passionate connection: feminism invigorates the teaching of nursing. *Nursing Outlook* 1993(41):117-124

- Henderson V 1980 Preserving the essence of nursing in a technological age. *Journal of Advanced Nursing* 1980(5):245-260
- Henderson V 1985 The essence of nursing in high technology. *Nursing Administration Quarterly* 9(4):1-9
- Henneman E 1995 Nurse-physician collaboration: a poststructuralist view. *Journal of Advanced Nursing* 1995(22):359-363
- Hickson P 1990 The promises of critical theory. Conference proceedings *Embodiment, Empowerment, Emancipation*. Melbourne.
- Hickson Pat 1992 Technology in nursing: a feminist critique. *Nursing Research: Scholarship for Practice Conference Proceedings*, Deakin Institute of Nursing Research, Deakin University: Geelong 1992 (1):231-241
- Hines P (ed) 1991 *Reconstructing Babylon: essays on women and technology*. Indiana University Press, Indianapolis
- Holden R 1991 Responsibility and autonomous nursing practice. *Journal of Advanced Nursing Practice*. 1991(16):398-403
- Holden P, Littlewood J (eds) 1991 *Anthropology and nursing*. Routledge, New York.
- Holloway I, Wheeler S 1996 *Qualitative research for nurses*. Blackwell Science, London
- Holmes B 1990 The influence of technology on holistic nursing. *Imprint* 37(3):64-65
- Holtz C, Wilson C 1992 The culturally diverse student. A model for empowerment. *Nurse Educator* 17(6): 28-31
- Humphreys D 1992 The role of the laboratory. Unpublished paper. McMaster University, Ontario
- Humphreys D 1992 Using demonstrations and puzzle experiments to stimulate thinking. Unpublished paper McMaster University, Ontario.
- Huntington A 1994 Women's work. *New Zealand Nursing Journal* April 1994:20-22
- Jacox A 1992 Health care technology and its assessment: where nursing fits in. In Aiken L, Fagin C (eds) *Charting nursing's future agenda for the 1990's*. Lippincott, Philadelphia
- Jacox A, Pillar B, Redman B, 1990 A classification of nursing technology. *Nursing Outlook* 38(2): 81-85
- James N 1989 Emotional labour: skill and work in social regulation of feelings. In unknown source Routledge :15-42
- James N 1992 Care=organisation+ physical labour +emotional labour. *Sociology of Health and Illness* 14(4):488-509
- Janeway E Power and Powerlessness: on the power of the weak. *Signs* 1(1):103-109
- Jecker N, Self D 1991 Separating care and cure: an analysis of historical and contemporary images of nursing and medicine. *The Journal of Medicine and Philosophy* 1991(16):287-306

- Jenks J 1993 The pattern of personal knowing in nurse clinical decision making. *Journal of Nurse Education* 32(9):399-403
- Johnson G 1993 Nursing care of patients with implanted pumps. *Nursing Clinics of North America* 28(4):873-883
- Johnstone A 1984 New stars to steer by? *Journal of Chemical Engineering* 61(10):847-849
- Jolly D 1989 Impact of technology on health care: a European perspective. *Australian Clinical Review* 9(1):39-45
- Kalisch P, Kalisch B (1987) *The changing image of the nurse*. Addison-Wesley, California.
- Keddy B, Jones I, Gillis M, Jacobs P, Burton H, Rogers M 1986 The doctor-nurse relationship: an historical perspective. *Journal of Advanced Nursing* 1986(11):745-753
- Keddy B 1992 The coming age of feminist research in Canadian nursing. *The Canadian Journal of Nursing Research* 24(2):5-10
- Keddy B, Sims S, Stern P 1996 Grounded theory as feminist research methodology. *Journal of Advanced Nursing* 1996(23):448-453
- Keller E 1980 Feminist critique of science: a forward or backward move? *Fundamenta Scientiae* 1980(1):341-349
- Kelly A V 1977 *The curriculum: theory and practice*. Harper and Row, London
- Kelly B 1992 The professional self-concepts of nursing undergraduates and their perceptions of influential forces. *Journal of Nursing Education* 31(3):121-125
- King K 1994 Method and methodology in feminist research: what is the difference? *Journal of Advanced Nursing* 1994 (20):19-22
- Kiyosaki R 1992 *If you want to be rich and happy, don't go to school? The Accelerated Learning Publishing Co, Australia*
- Knafl K, Webster D 1988 managing and analysing qualitative data: a description of tasks, techniques and materials. *Western journal of Nursing research* 10(2):195-218
- Kneedler J 1990 Technology affects OR practices. *Today's O.R. Nurse* 12(6):4-5
- Koch T 1994 Establishing rigour in qualitative research: the decision trail. *Journal of Advanced Nursing* 1994(19):976-986
- Koh P, Thomas V 1994 Patient-controlled analgesia (PCA): does time saved by PCA improve patient satisfaction with nursing care? *Journal of Advanced Nursing* 1994 (20):61-70
- Kosowski M 1995 Clinical learning experiences and professional nurse caring: a critical phenomenological study of female baccalaureate nursing students. *Journal of Nursing Education* 34(5):235-242
- Kramer M 1993 Concept clarification and critical thinking: integrated processes. *Journal of Nursing Education* 32(9):406-414

- Lackey N 1992 Qualitative research. Methodologies: application, part 1. *Journal of Post Anaesthesia Nursing* 6(4):290-293
- Lackey N 1992 Qualitative research. Methodologies: application, part 2. *Journal of Post Anaesthesia Nursing* 7(2):119-128
- Larrivee C, Joseph D 1992 Strategies for teaching decision making: discrepancies in cuff versus invasive blood pressures. *Dimensions of Critical Care Nursing* 11(5):278-285
- Lather P 1986 Issues in validity in openly ideological research: between a rock and a hard place. *Interchange* 17(4):63-84
- Lather P 1986 Research as praxis. *Harvard Educational Review* 56(3):257-277
- Lather P 1988 Feminist perspectives on empowering research methodologies. *Women's Studies International Forum* 11(6):569-581
- Lather P 1989 Deconstructing/deconstructive inquiry: issues in feminist research methodologies. Unpublished paper delivered to the New Zealand Women's Studies Association Conference
- Lawler J 1991 Behind the screens: nursing sumology and the problem of the body. Churchill Livingstone, Melbourne
- Lederman R 1991 Content analysis of word texts. *MCN: The American Journal of Maternal/Child Nursing* 1991(16):169
- Lederman R 1991 Content analysis: reliability and validity. *MCN: The American Journal of Maternal/Child Nursing* 1991(16):199
- Lederman R 1991 Content analysis: steps to a more precise coding procedure. *MCN: The American Journal of Maternal/Child Nursing* 1991(16):275
- Leech S 1993 Feminist research, moral perspectives and nurse education. In *National Nursing Conference proceedings , Critical Theory and Feminism: empowering nursing's future*. Griffiths University, Melbourne
- Leuning C 1994 Women and health: power through perseverance. *Holistic Nursing Practice* 8(4):1-11
- Lewin E 1977 Feminist ideology and the meaning of work: the case of nursing. In Hillman J, Renault G (eds) *Catalyst Issue* 1977(10-11):78-105
- Liaschenko J 1993 Feminist ethics and cultural ethos: revisiting a nursing debate. *Advances in Nursing Science* 15(4):71-81
- Lindberg J, Hunter M, Kruszewski A 1990 Nursing today: the health science of caring. In *Introduction to nursing: concepts, issues and opportunities*. Lippincott, Philadelphia
- Lindgren H 1962 *Educational psychology in the classroom* 2nd edition. John Wiley & Sons. New York
- Linn P 1987 Gender stereotypes, technology stereotypes. In McNeil M. (ed.) *Gender & Expertise*. Free Association Books, London:130-223

- Lumby J 1991 Nursing reflecting on evolving practice. Deakin University Press, Geelong
- Lumby J, Zetler J 1991 The image of the nurse in the nineties 1980-1990? Unpublished paper University of Technology, Sydney.
- Lumby J 1993 A feminist's method. *New Zealand Nursing Journal* June 1993:17-18
- Lyman K 1961 Basic nursing education programmes: a guide to their planning. World Health organisation, Geneva.
- Ma M 1989 Ethical issues of technology today. *Australian Confederation of Operating Room Nurses Journal* June 1989:65-67
- Malloy G 1993 Codependency: a feminist perspective. *Journal of Psychosocial Nursing* 31(4):15-32
- Manning J, Broughton V, McConnell E 1995 Reality Based Scenarios Facilitate Associated Knowledge Networks. *Contemporary Nurse* 4(1):16-21
- Marles F 1988 Report: study of professional issues in nursing. Australian Government Publishing Service, Melbourne.
- Marsden C 1991 Technology assessment in critical care. *Heart & Lung* 20(1): 93-94
- Mason A 1993 Nursing practice outside scientific positivist models. In *National Nursing conference proceedings. Critical Theory Feminism and Nursing: empowering nursing's future*. Griffith University, Melbourne 1993:74-77
- Mason D, Talbott S 1985 Political action handbook for nurses, changing the workplace. Government, Organisations and Community. Addison-Wesley, California.
- McAllister M 1995 Feminist pedagogy: developing creative approaches for teaching students of nursing. *Journal of Nursing Education* 34(5):243-245
- McClure M 1991 Technology - a driving force for change. *Journal of Professional Nursing* 7(3):14
- McConnell E 1990 The impact of machines on the work of critical care nurses. *Critical Care Nursing Quarterly* 12(4) ;45-52
- McConnell E, Murphy E 1990 Nurses' use of technology: an international concern. *International Nurses Review* 37(5): 331-334
- McConnell E 1991 Key issues in device use in nursing practice. *Nursing Management* 22(11): 32-33
- McConnell E, Newland H, Manning J, Paech M 1993 Technology assessment applied: a comparison of ophthalmic diagnostic techniques to detect diabetic retinopathy among Aboriginal people in central Australia. *Contemporary Nurse* 2(1)23 -27
- McConnell E, Nissen J 1993 The Use of medical equipment by Australian registered nurses. *Journal of Clinical Nursing* 1993 (2):341-348
- McConnell E, Fletcher J, Nissen J 1993 A comparison of Australian and American registered nurses' use of life-sustaining medical devices in critical care and high-dependency units. *Heart & Lung* 22 (5):421-427

- McConnell E 1994 Perioperative nurses' roles in managing new technology *American Operating Room Nurses Journal* 60(5):815-827
- McConnell E, Fletcher J, Nissen J 1995 A comparison of agency and hospital nurses. *International Journal of Technology Assessment in Health Care* 11(3):585-609
- McConnell E 1995 Complexity in selecting health care technology in diverse settings. *Holistic Nursing Practice* 9(2):1-8
- McConnell E 1995 Using medical equipment: risky business? *Nursing* 95 January:62-63
- McConnell E, Cattonar M, Manning J 1996 Australian registered nurse medical device education: a comparison of simple vs. complex devices. *Journal of Advanced Nursing* 1993 (23):322-328
- McConnell E, Hilbig J 1996 Quality patient care through education. *Australian Confederation of Operating Room Nurses Journal* March 1996:17-19
- McConnell E 1996 The future of technology in critical care. *Critical Care Nurse Supplement* June 1996:1-16
- McCormick K 1986 Preparing Nurses for the technologic future. In Hein E, Nicholson M (eds) *Contemporary Leadership Behavior* 2nd Edition Little Brown and Co, Boston Ch 45
- McGaw J 1982 Women and the history of American technology. *Signs: Journal of Women in Culture and Society* 7(4):789-828
- McMillan M, Dwyer J 1990 Facilitating a match between teaching and learning style. *Nurse Education Today* 1990(10):186-192
- McNeil M 1987 Being reasonable feminists. In *Gender and expertise*. Free Association Books, London 13-61
- Medcof J, Wall R 1990 Work technology and the motive profiles of nurses. *The Canadian Journal of Nursing Research* 22(3):51-65
- Melia K 1987 *Conclusions and beyond: learning and working*. Tavistock Publications, London
- Meredith L 1987 Anne Conlon Memorial Lecture 1986 Working our way to the bottom: women and nursing. In Kaplan (ed) *Labour History* (52):96-102
- Mies M 1983 Towards a methodology for feminist research. In Bowles G, Klein R (eds) *Theories of women's studies*. Routledge & Kegan Paul, London:379-393
- Minichiello V 1990 .In-depth interviewing: researching people. Longmire Cheshire, Australia: Ch 6
- Moore T W 1974 *Educational Theory: an introduction*. Routledge and Kegan, London.
- Mulhall A 1990 The Contribution of the basic sciences to nursing practice research. *Journal of Advanced Science*. 1990(15):1354-1357
- Nash K 1994 The feminist production of knowledge: is deconstruction a practice of women. *Feminist Review* Summer 1994 (47):65-77

- Neighbors M, Eldred E, Sullivan M 1990 Nursing skills necessary for competency in the high-tech health care system. *Nursing & Health Care* 12(2):92-97
- Nelms T, Gray P 1993 Role modeling: a method for teaching caring in nursing education. *Journal of Nursing Education* 32(1):18-23
- Nelson M 1988 Advocacy in nursing. *Nursing Outlook* 36(3):136-403
- Neumann R 1994 Valuing quality teaching through recognition of context specific skills. *Australian Universities' Review* 37(1):8-13
- Newman M 1991 Prevailing paradigms in nursing. *Nursing Outlook* 40(1):10-32
- Nichols S 1995 Gendered modes of participation in school literacies. *Newsletter Australian Literacy Educators' Association* 1995(4):1&7
- Nicholson L 1992 Feminism and postmodernism- another view. *Boundary 2 Summer* 1992:34-52
- Norbeck JS 1986 In defense of empiricism. *Image: Journal of Nursing Scholarship* 19(1):28-30
- Nurses Board of South Australia 1991 Definition of Nurse, Enrolled Nurse and Nursing. Adelaide
- Oakley A 1981 Interviewing women: a contradiction in terms. In Roberts H (eds) *In Doing feminist research*. Routledge, London
- Oermann M 1994 Reforming nursing education for future practice. *Journal of Nurse Education* 33(5):215-219
- Orchard C 1994 The nurse educator and the nursing student: a review of the issue of clinical evaluation procedures. *Journal of Nursing Education* 33(6):246-255
- O'Neil S 1991 Questioning the use of invasive technology. *American Journal of Nursing* January 1991:19-20
- Paech M 1991 Challenging healthcare economics and technology to save the environment. *International Nursing Review* 38(4):111-114
- Pagana K. 1989 Writing to demystify publishing. *The Journal of Continuing Education in Nursing* 23(2):58-63.
- Paige P 1990 Noninvasive monitoring of neonatal respiratory system. *American Association Childrens Nursing* 1(2):409-421
- Palmer A, Burns S, Bulman C (eds) 1994 Reflective practice in nursing. The growth of the professional practioner. Blackwell Science, Cornwall: Ch 5-6
- Pankowski M 1984 Creating participatory, task oriented learning environments. In Sock T (ed) *Designing and implementing effective workshops*. Jossey-Bass, San Francisco
- Parker J 1987 The challenge of change: nursing and the impact of technology. Conference proceedings of College of Nursing, Australia: Northern Territory meeting.

- Parker J, Gardner G 1992 The silence and the silencing of the nurse's voice: a reading of patient progress notes. *The Australian Journal of Advanced Nursing* 9(2):3-9
- Parrott T 1993 Dismissal for clinical deficiencies. *Nurse Educator* 18(6):14-17
- Patterson C 1990 Quality assurance, control, and monitoring: the future role of information technology from the joint Commission's perspective. *Computers in Nursing* 7(3):105-118
- Patton M 1990 *Qualitative evaluation and research Methods* 2nd edition. Sage, Newbury Park
- Pauly-O'Neill S 1991 Questioning the use of invasive technology. *American Journal of Nursing* January 1991:19-20
- Pearson A 1988 *Nursing: from whence to where? Inaugural Professorial Lecture* Deakin University, Geelong
- Pearson A 1990 *Knowing nursing: emerging paradigms in nursing*. In Vaughan B, Robinson K (eds) *Knowledge in nursing*. Heinemann Nursing, Oxford
- Pelletier D 1991 Technology marches on: considerations for the nursing profession. *Australian Health Review* 13(3):203-210
- Pelletier D 1992 Patients experience of technology at the bedside: intravenous infusion control devices. *Journal of Advanced Nursing* 1992 (17):1274-1282
- Pelletier D 1993 The focused use of posters for graduate education in the complex technological nursing environment. *Nurse Education Today* 1993(13):382-388
- Pelletier D 1995 Diploma-prepared nurses' use of technological equipment in clinical practice. *Journal of Advanced Nursing* 1995(21):6-14
- Penney D 1991 Haemorrhage and culture: management in the developing World and cultural implications for nursing care. *NAACOG: Clinical Issues in Perinatal and Women's Health Nursing* 2(3):339-343
- Perry C 1993 Learners and learning styles. *Access* 7(3):10-13
- Perry P 1994 Feminist Empiricism as a method for inquiry in nursing. *Western Journal of Nursing Research* 16(5):480-494
- Petrucci K, Canfield K 1992 Improving automated care planning with plan libraries: a future use of technology in nursing. *Nursing Economics* 10(4):297-301
- Phillips C, Hagenbuch E, Baldwin P 1992 A collaborative effort in using telecommunications to enhance learning. *The Journal of Continuing Education in Nursing* 23(3):134-139
- Pickhaver A, Young B, Goldsworthy T 1985 *They seem different somehow*. Commonwealth Tertiary Education Commission, Flinders University Relations Unit, Bedford Park.
- Pillar B 1992 Bioethical Issues in the use of technology. *Nursing Economics* 10(6):419-422
- Pillar B, Jacox A 1992 The control of health care technology. *Nursing Economics* 10(2):152-153

- Pillar B, Jacox A, 1991 The introduction of new technology on the nursing unit. *Nursing Economics* 9(1):50-51&63
- Pillar B, Jacox A, Redman B 1990 Technology its assessment, and nursing. *Nursing Outlook* 38(1):16-19
- Pillitteri A 1994 A contrast in images: nursing and nonnursing college students. *Journal of Nursing Education* 33(3):132-133
- Pocock B 1988 *Demanding skill, women and technical education in Australia*. Allen and Unwin, Sydney.
- Porter S 1993 Nursing research conventions: objectivity or obfuscation? *Journal of Advanced Nursing* 1993(18):137-143
- Pringle R, Watson S 1992 Women's interests' and the post-structuralist state. In Barrett M, Phillips A (eds) *Destabilising Theory: Contemporary Feminist Debates*. Polity Press
- Probert B 1993 Computers in the office: new skills, jobs and careers. In Goldsworthy A, Meredith H (eds) *Technological change: women in technology, impact of information technology 1993*. National Information Technology Council Inc, Microdata, Canberra: Ch 12
- Quivey M 1990 Advanced medical technology: finding the answers. *International Nursing Review* 1990 (37):329-330&344
- Ramanamma A, Bambawale U 1984 Occupational attitudes of nurses: a sociological study. *Journal of Sociological Studies* Jan 1982 (3):82-94
- Ramprogus V 1988 Learning how to learn nursing. *Nurse Education Today* 1988(8):59-67
- Ray M 1987 Technological caring: a new model in critical care. *Dimensions of Critical Care Nursing* 6(3):166-173
- Reid B 1991 Developing and documenting a qualitative methodology. *Journal of Advanced Nursing* 1991(16):544-551
- Reilly D, Behrens-Hanna L 1991 Perioperative nursing: moral and ethical issues in high-technology practice. *Today's O.R. Nurse* August 1991:10-34
- Reinharz S 1992 *Feminist methods in social research*. Oxford University Press, New York
- Reiser S 1986 Assessment and the technologic present. *International Journal of Technology Assessment in Health care* 1986(2):7-12
- Remington M, Kroll C 1990 The 'High Risk' nursing student: identifying the characteristics and learning style preferences. *Nurse Education Today* 10(1): 31-37
- Roberts S 1983 Oppressed group behaviour: implications for nursing. *Advances in Nursing Science* 5(4):21-30
- Robinson M 1991 *The role of the nurse in Australia*. National Health and Medical Research Council, Australian Government Publishing Service, Canberra

- Rosenal L 1995 Exploring the learner's world: critical incident methodology. *Journal of Continuing Education in Nursing* 26(3):115-118
- Rothschild J 1981 A feminist perspective on technology and the future. *Women's Studies International Quarterly* 4(1):65-74
- Round K 1993 Report from the ward. *Nursing* January/February 1993:33-39
- Ruffing-Rahal M 1992 Incorporating feminism into the graduate curriculum. *Journal of Nursing Education* 31(6):247-251
- Ryan S, Porter S 1993 Men in nursing: a cautionary comparative critique. *Nursing Outlook* 41(6):262-267
- Saltman D 1991 An historical Perspective- women as healers. In *Women and Health An Introduction to Issues*. Harcourt, Brace Jovanovich, Sydney: Ch 1
- Salvage J 1985 *The politics of nursing*. Heinemann, Oxford.
- Sandelowski M 1986 The problem of rigour in qualitative research. *Advances in Nursing Science* 8(3):27-37
- Sandelowski M 1991 Telling stories: narrative approaches in qualitative research. *Image: Journal of Nursing Scholarship* 23(3):161-166
- Sandelowski M 1993 Rigor or rigor mortis: the problem of rigor in qualitative research revisited. *Advances in Nursing Science* 16(2):1-8
- Sandelowski M 1993 Theory unmasked: the uses and guises of theory in qualitative research. *Research in Nursing and Health* 1993(16):213-218
- Sandelowski M 1993 Toward a theory of technology dependency. *Nursing Outlook* 41(1):36-42
- Sandelowski M 1994 Notes on transcription. *Research in Nursing and Health* 1994(17):311-314
- Sandelowski M 1994 The use of quotes in qualitative research. *Research in Nursing & Health* 1994(17):479-482
- Sandelowski M 1995 On the aesthetics of qualitative research. *Image: Journal of Nursing Scholarship* 27(3):205-209
- Sandelowski M 1995 Qualitative analysis: what it is and how to begin. *Research in Nursing and Health* 1995(18):371-375
- Sanford N 1986 Preparing nurses for the technologic future. In Hein E, Nicholson M (eds) *Contemporary leadership Behavior* 2nd Edition. Little Brown and Co, Boston: Ch 44
- Sarnecky M 1993 Julia Catherine Stimson: nurse and feminist. *Image: Journal of Nursing Scholarship* 25(2):113-119
- Schreiber R 1993 Pay equity and North American nurses. *Nursing and Health Care* 14(1):28-33
- Schultz J 1980 Nursing and technology. *Medical Instrumentation* 14(4):211-214

- Schultz S 1994 Exploring the benefits of a subjective approach in qualitative nursing research. *Journal of Advanced Nursing* 1994 (20):412-417
- Schumacher K, Gortner S 1992 (Mis)conceptions and reconceptions about traditional science. *Advances in Nursing Science* 14(4):1-11
- Schuster E 1993 Greening the Curriculum. *Journal of Nursing Education* 32(8):381-383
- Scott J 1990 Deconstructing equality-versus-difference: or, the uses of poststructuralist theory for feminism. In Hirsch M, Keller E (eds) *Conflicts in Feminism*. Routledge, London: Ch 8
- Sedlak C 1992 Use of clinical logs by beginning nursing students and faculty to identify learning needs. *Journal of Nursing Education* 31(1):24-27
- Seibold C, Richards I, Simon D 1994 Feminist method and qualitative research about midlife. *Journal of Advanced Nursing* 1994 (19):394-402
- Seidl A, Sauter D 1990 The new non-traditional student in nursing. *Journal of Nursing Education* 29(1):13-19
- Short S, Sharman E 1987 The nursing struggle in Australia. *Image: Journal of Nursing Scholarship* 19(4):197-200
- Shott S 1979 Emotion and social life: a symbolic interactionist analysis. *American Journal of Sociology* 84(6):1317-1334
- Silva M 1986 Research testing nursing theory: state of the art. *Advances in Nursing Science* 9(1):1-11
- Small W 1996 The concept of emotion work. In Grbich C (ed) *Health in Australia*. Prentice Hall Australia: Chapter 12
- Smith C, Perkins S, Pingleton S 1994 Caregiver learning needs and reactions to managing home mechanical ventilation. *Heart & Lung* 23(2):157-163
- Sohier R 1992 Feminism and nursing knowledge: the power of the weak. *Nursing Outlook* 40(2):62-93
- Sommargren C 1995 Environmental hazards in the technological age. *Critical Care Nursing Clinics of North America* 7(2):287-294
- Spector A 1986 The clinical engineer's role in design of medical devices. *Medical Instrumentation* 20(1):11--12
- Speedy S 1987 Feminism and the professionalization of nursing. *The Australian Journal of Advanced Nursing* 4(2):20-27
- Speedy S 1991 The contribution of feminist research. In Gray G, Pratt R.(eds). *Towards a discipline of nursing*. Churchill Livingstone, Sydney:191-210
- Stanley L, Wise S 1983 Back into the personal or: our attempt to construct 'feminist research'. In Bowles & Klien (eds) *Theories of Women's Studies*. Routledge & Kegan Paul, London:192-209
- Stark J 1995 Critical thinking: taking the road less travelled. *Nursing* 95 November:53-56

- Stein L, Watts D, Howell T 1990 Sounding Board: the doctor-nurse game revisited. *The New England Journal of Medicine* 322(8):546-549
- Stenhouse L 1975 *An Introduction to curriculum research and development*. Heinemann, London: Ch 1-4
- Stephens G 1992 Technology and its affect on nursing. *Canadian Operating Room Nursing Journal* 1993(18):163-167
- Stones 1966 *An Introduction to educational psychology*. Methuen, London
- Strauss A, Corbin J 1990 *Basics of qualitative research: grounded theory procedures and techniques*. Sage, Newbury Park
- Street A 1990 *Nursing practice high ground, messy swamps and pathways in between*. Deakin University Press, Geelong
- Street A 1991 *From image to action*. Deakin University Press, Geelong
- Street A 1996 Writing qualitative research for publication. *Contemporary Nurse* 5(1):6-11
- Street A 1992 *Inside nursing: a critical ethnography of clinical nursing practice*. State University of New York Press, Albany: Ch 4
- Sturch E 1994 Assessment of learning in the cross-cultural domain: reflection leads to learning for the teacher. *Journal of Advanced Nursing* 1994(19):749-754
- Taft L 1993 Computer-assisted qualitative research. *Research in Nursing and Health* 1993(16):379-383
- Tanner C 1993 More thinking about critical thinking and clinical decision making. *Journal of Nursing Education* 32(9):387
- Taylor H 1989 Technology: a current perspective. *Australian Confederation of Operating Room Nurses* June 1989:61-64
- Techendorff J 1996 Emancipation - is it just a dream? *Australian Journal of Advanced Nursing* 13(2):3-4
- Tellis-Nayak M, Tellis-Nayak V 1984 Games that professionals play: the social psychology of physician-nurse interaction. *Social Science & Medicine* 18(12):1063-1069
- Therapeutic Device Bulletin editors 1990 Who reports the problem? *Therapeutic Devices Branch, Therapeutic Goods Administration Canberra* December 90(4):2-5
- Thomas B 1991 Computer-assisted decision making: a strategy for primary prevention of substance abuse. *Journal of Paediatric Health Care* 1991(5):257-263
- Thomas B 1992 Challenges for teachers of women's health. *Nurse Educator* 17(5):10-14
- Thompson R 1993 The effects of advanced technology on theatre nursing. In *Conference Proceedings, World Conference Association Operating Room Nurses Adelaide* 1993:149-152
- Tong R 1989 *Feminist thought*. Allen & Unwin, Sydney

- Tosch P 1988 Patients' recollections of their posttraumatic coma. *Journal of Neuroscience Nursing* 20(4):223-228
- Towns D 1985 *The responsibility to educate girls for a technologically orientated society*. Deakin University Press, Melbourne.
- Tschikota S 1993 The clinical decision-making processes of student nurses. *Journal of Nursing Education* 32(9):389-397
- Tyler R 1974 *Basic Principles of curriculum and instruction*. University of Chicago Press, Chicago.
- Valentine P 1991 Feminism a four-letter word? *The Canadian Nurse*. 1992(12):20-23
- Van Ort S, Putt A 1985 *Teaching in collegiate schools of nursing*. Little Brown and Com, Boston
- Vidovich M 1990 The tragic tale of the feminist nurse. *The Australian Nurses Journal* 20(4):12-14
- Wajcman J 1991 *Feminism confronts technology*. Polity Press, Cambridge.
- Wajcman J 1994 Technological a/genders: technology, cultur and class. In Green&Guinery (eds) *Framing Technology: society, choice &change*. Allen & Unwin: Ch 1
- Walker B 1980 Technological change: issues and impacts. *Lamp* October 1980:59-62
- Walker K 1994 Research with/in nursing: 'troubling' the field. *Contemporary Nurse* 3(4):162-168
- Walker K 1995 Nursing, narrativity and research: toward a poetics and politics of orality. *Contemporary Nurse* 4(4):156-163
- Wallisgrove R 1980 Alice through the microscope. In Brighton Women and Science Group (eds) *The Masculine Face of Science*. Virago, London.
- Walters A 1994 An interpretative study of the clinical practice of critical care nurses. *Contemporary Nurse* 3(1):21-25
- Walters A 1994 Phenomenology as a way of understanding nursing. *Contemporary Nurse* 3(3):134-141
- Walters J 1995 Technology and the lifeworld of critical care nursing. *Journal of Advanced Nursing* 1995(22):338-346
- Webb C 1993 Feminist research: definitions, methodology, methods and evaluation. *Journal of Advanced Nursing* 1993(18):416-423
- Weedon C 1987 *Feminist practice and post-structuralist theory*. Blackwell, Oxford
- Weiler K 1989 *Feminist methodology in women teaching for change: gender, class and power*. Bergin and Garvey, New York:57-72
- White D 1990 Computerised technology in nursing implications for the future. *Confederation of Critical Care Nurses Journal* 3(1):26-30

- Wichowski H, Kubsch S 1995 How nurses react to and cope with the uncertainty of unfamiliar technology: validation for continuing education. *Journal of Continuing Education in Nursing* 26(4):174-178
- Widnall S 1988 Voices from the pipeline. *Science* 1988 (241):1740-1745
- Wiens A 1993 Patient autonomy. *Journal of Professional Nursing* 9(2):95-103
- Wilcox J 1994 Nursing Assessment: more than merely 'doing the obs'. *Contemporary Nurse* 3(1):41
- Williams C, Heikes J 1993 The importance of researcher's gender in the in-depth interview: evidence from two case studies of male nurses. *Gender and Society* 7(2):280-291
- Wilson J 1963 *Thinking with concepts*. Cambridge University Press, London
- Wink D 1993 Using questioning as a teaching strategy. *Nurse Educator* 18(5):11-15
- Women in Science, Engineering and Technology Advisory Group 1995 Discussion paper: Women in Science, Engineering and Technology. Australian Government Publishing Service, Canberra
- Wright B 1990 Women, work and the university-affiliated Technology Park. In Wright (eds) *Women Work and Technology : Transformations*. Uni. of Michigan, USA :353-370
- Wuest J 1993 Removing the shackles: a feminist critique of noncompliance. *Nursing Outlook* 1993(41):217-224
- Wuest J 1994 A feminist approach to concept analysis. *Western Journal of Nursing Research* 16(5):577-586
- Zwolski K 1989 Professional nursing in a technical system. *Image: Journal of Nursing Scholarship* 21(4):238-242



THE UNIVERSITY OF ADELAIDE

Department of Women's Studies
The Undercroft, Ground Floor Napier Building

Invitation to Participate In A Research Project

1 February, 1996

Dear

I am writing to invite you to participate in a small research project which will complete the requirements for the degree Master of Arts (Women's Studies) which I am undertaking at the University of Adelaide. The title of the project is: 'Gender and Technology: Implications for teaching technological device use in an Undergraduate Nursing Program'. The research will focus on how undergraduate nursing students (third year students who have completed practicum) learnt to use technological devices (e.g. infusion pumps, glucometers, dopplers, etc.) during the program. I wish to explore the factors which influenced and facilitated and/or hindered the learning process during the past three years of the undergraduate nursing program. I am also interested in your own past learning experiences related to both technology and gender aspects and how that might also have impacted on your learning about and use of technological devices.

You have been chosen as a potential participant in this research project through a selective random sampling process. The sample of students chosen are representative of the percentage of female and male students enrolled in the 1995 third year undergraduate nursing program at School of Nursing: City East campus. The collection of data is through a 30-60 minute semi-structured interview and data collection will commence in January 1996. The venue for interview is my office or the communication laboratories in Centenary Building, at the University of South Australia, School of Nursing: City East campus, but other arrangements can be negotiated with you.

A pseudonym will be used so that your identify is not disclosed and confidentiality will be maintained. The interview will be taped and then transcribed. Once the tape is transcribed the recording will be erased. Upon completion of the project the transcript of the tape will be kept in a secure locked cabinet within the Women's Studies Department for seven years after completion (as per University policy).

The research will be conducted within the ethical framework and relevant guidelines of the Ethics Committee of the Women's Studies Department of the University of Adelaide and the Human Research Ethics Committee of the University of South Australia. Permission has also been sought, and granted from, the Dean, Faculty of Nursing, the Head, School of Nursing: City East campus and the Chair of the Faculty's Research Management Committee.

A copy of the report will be lodged in the Library of the University of Adelaide and the University of South Australia upon the project's completion.

Your participation in this project is voluntary and you may withdraw at any time until the data collection is complete. If you choose to participate please fill in the enclosed form and post it to me in the supplied Reply Paid envelope. Your participation will be valued and appreciated.

If you have any questions regarding the project please contact Mr John Hepworth, Chair, Human Research Ethics Committee, University of South Australia, telephone _____ or facsimile (_____)

Yours sincerely,

Judith Manning

Postgraduate Student, Master of Arts (Women's Studies) University of Adelaide and Lecturer (University of South Australia, Faculty of Nursing: City East campus)

If you have any concerns about this research please contact:

Supervisor: Margaret Allen PhD

University of Adelaide, Department of Women's Studies,
Ground Floor, Undercroft, Napier Building, North Terrace, Adelaide, SA 5005

or

Head, Department of Women's Studies, University of Adelaide, Department of Women's Studies,
Ground Floor, Undercroft, Napier Building, North Terrace, Adelaide, SA 5005



THE UNIVERSITY OF ADELAIDE

Department of Women's Studies
The Undercroft, Ground Floor Napier Building

Title: Gender and Technology: Implications for teaching technological device use in an Undergraduate Nursing Program

1. I have read the original introductory letter written by Judith Manning, and understand the nature of the research project.
2. I agree to take part in a single semi-structured interview, which I understand will be taped and subsequently transcribed.
3. I understand that while information gained from this project will be published:
 - Confidentiality will be maintained and I will not be identified;
 - The interview tape will be erased once transcribed.
 - The transcribed data collected will be stored in a secure, locked cabinet in the Women's Studies Department, University of Adelaide, for the required period of seven years and then destroyed (as per University policy);
 - A copy of the final report will be made available via the Library.
4. I understand that I have the option to check the transcript once transcribed. I wish to check the transcript. Yes/No (please circle)
5. I understand that I may withdraw from the project prior to the completion of data collection, and this will not effect my status now or in the future. I understand that I do not need to give a reason for withdrawing.
6. I understand that there are no financial benefits from participation in this project.
7. I confirm that I am over 18 years of age.

Name of Participant:

Signed: Date:

I certify that I have explained the study to this volunteer participant, and consider that she/he freely agrees to participate and understands the mechanism for her/his participation.

Name (printed):

Investigator: Judith Manning, RN
Postgraduate Student Master of Arts (Women's Studies) University of Adelaide
Supervisor: Margaret Allen, PhD
University of Adelaide, Department of Women's Studies,
Ground Floor, Undercroft, Napier Building, North Terrace, Adelaide, SA 5005



THE UNIVERSITY OF ADELAIDE

Department of Women's Studies
The Undercroft, Ground Floor Napier Building

Judith Manning
c/o Faculty of Nursing
University of South Australia
North Tce., Adelaide SA 5000

**Re: Invitation to participate in Project titled:
'Gender and technology: Implications for teaching technological device use in an
undergraduate nursing program'**

Dear

I wrote to you recently inviting you to consider participating in the above project. As I have not yet received a reply from you I am again writing to ask you to please consider participating. I am seeking new graduates from the Bachelor of Nursing Program City East program to volunteer for a 30 minute interview, which would be held in my office or any alternate venue which might better suit you.

The focus of the research is on how undergraduate nursing students learnt to use technological devices (e.g. infusion pumps, glucometers, dopplers, automatic blood pressure measuring devices etc.) during the program. I wish to explore the factors which influenced and facilitated and/or hindered the learning process during the past three years of your undergraduate program. I am also interested in your own past learning experiences related to both technology and gender aspects and how that might also have impacted on your learning about and use of technological devices.

A pseudonym will be used so that your identity is not disclosed and confidentiality will be maintained. The interview will be taped and then transcribed. Upon completion of the project the transcript and the tape will be kept in a secure locked cabinet within the Women's Studies Department for seven years after completion (as per University policy).

Your participation in this project is voluntary and you may withdraw at anytime until the data collection is complete.

You can contact me by telephoning my office at the Faculty of Nursing: City East on : and leaving a message. I will contact you promptly if you take this option. I would appreciate a reply from you by 30 April 1996, otherwise I will presume you do not wish to participate

The research will be conducted within the ethical framework and relevant guidelines of the Ethics Committee of the Women's Studies Department of the University of Adelaide and the Human Research Ethics Committee of the University of South Australia.

If you have any ethical questions regarding the project please contact Mr John Hepworth, Chair, Human Research Ethics Committee, University of South Australia, telephone

I look forward to you reply.

Yours sincerely,

Judith Manning

Postgraduate student, Master of Arts (Women's Studies) University of Adelaide
Lecturer (University of South Australia, Faculty of Nursing: City East)

If you have any concerns about this research please contact:

Supervisor: Margaret Allen PhD

University of Adelaide, Department of Women's Studies

Ground Floor, Undercroft, Napier Building, North Tce Adelaide SA 5005

Explain :

Purpose of study
Freedom to answer or not answer questions

Sign two consent forms.

(One to interviewee, one for interviewer to keep for seven years)

Start tape.

State pseudonym, ask age and if any nursing experience other than that which has occurred within the undergraduate program.

Questions

Please tell me what is meant by the term technology?

Please define you own ideas of what is a technological device? (or medical device?)

Which technological devices have you seen in either practice in the laboratory or on field placement?

What technological devices have you used when providing nursing care to a client?

What other technological devices have you used on field placement which were not directly involved with client care?

How did you learn to use these devices in the laboratory and with clients?

How did you feel when you were learning to use technological devices?

Did any of them make you feel nervous when you were learning to use technological devices? In what way?

What role did your peers play in the learning process?

Please explain the role that lecturers, learning activities and materials played?

How did you feel when you used the technological devices when caring for a client?

How did practice with devices in the laboratory make you feel?

What things made you feel confident? (Prompts to consider - environment, role of self in learning, peers, role models, teachers, nurse clinician, client)

What hindered your learning when learning to use technological devices?

What facilitated your learning in the laboratory?

What have you learnt about technological devices?

(Prompts - Pick an example and prompt with following if nec: purpose, safety features, alarms, effect on clients physiological self, turn on/off, dangers for client, self, disposal of consumables, cleaning requirements, National Standards applicable)

How did you feel when learning to use other pieces of technology?

Who were the people who influenced you most in using home equipment (Prompts - VCR, TV, microwave, car, telephone, science e.g. Bunsen Burner experiments, chemical tests?)

What role did the men and women of your family play in assisting you to learn about technology?

What examples describe or explain how you learnt to use these pieces of technological equipment?

How did these life experiences influence how your feelings when you used technological devices

People learn in different ways. How do you like to learn? (Prompt with learning styles if necessary)

Return to clinical practice

What role do you think the device should have in nursing work?

What is your perception of the role and impact of technological devices use on client care?

Have you been aware of any ethical or moral dilemmas for yourself or other nurses when a technological device has been used in the care of clients? Can you give me some examples?

How did you feel when using a technological device for the first time with a client?
How did you feel as you used the devices more often?

What do you consider to be the essential elements of quality nursing?

What role do you think conventional gender roles play in the learning process?

What role does the media portray about technology use by men and women?

Are there any further comments that you would like to make?