CHAPTER THREE

PHENOMENOGRAPHY: A QUALITATIVE APPROACH FOR EXPLORING UNDERSTANDING

About thirty years ago a group of Swedish researchers developed the qualitative research approach known as phenomenography. Their research approach is of use when peoples' understanding of their experience of their surrounding world is the goal of research. The researcher's goal was to identify a qualitative research methodology that identified and retained the language of research participants and focused upon people's understanding of their experience of the world around them. This goal was achieved and the outcome is a distinctive qualitative research approach that may be applied to health care research and the discipline of nursing. This chapter reviews assumptions of **phenomenography as an evolving research approach** and explains the **phenomenographic method used for the research**. It is argued that the research approach has been useful for the current research and is of benefit to nursing research when there is need to describe the qualitatively different ways phenomena are understood and experienced.

PHENOMENOGRAPHY: AN EVOLVING RESEARCH APPROACH

Phenomenography has evolved from work begun by a team of researchers at the Department of Education, University of Gothenburg, Sweden (Dahlgren & Fallsberg, 1991), and was first developed during the 1970's, as a new qualitative approach to understand the meaning of learning. Marton (1981:180) as has described the approach as:

> ...research which aims at description, analysis, and understanding of experiences; that is, research which is directed towards experiential description.

The team aimed to develop a research approach that focussed on understanding and learning. It identified an inadequacy in existing research methodology, particularly when understanding of experience is the goal. The team's research revealed that when a group of students read the same excerpt from a passage of text, they understood the text in a limited number of qualitatively different ways. The students expressed different understandings of the same material, and this variation in understanding could be clearly arranged by researchers into discrete categories.

From this initial research it was argued by Marton (1986:37), that if students had a finite number of qualitatively different understandings of learning then it was reasonable to expect that people hold finite numbers of qualitatively different understanding of all kinds of phenomena. Subsequent research has demonstrated this expectation to be correct (e.g. Backe, Larsson & Fridlund, 1996; Barnard, 1994; Dahlgren & Fallsberg, 1991; Gerber *et al.*, 1993; Kwan & Gerber, 1994; Lybeck, Marton, Stromdahl & Tullberg, 1988; Marton 1986; Marton, 1992b; Marton, Carlsson & Halasz, 1992; McCosker, 1995; Nordenbo, 1990; Renstrom *et al.*, 1990; Sandberg, 1994; Svensson, 1989; and Young, 1994). Over the last twenty years phenomenography has continued to emerge as a distinctive approach to qualitative research and is sometimes referred to as empirical phenomenology, contextual analysis, or phenomenologically grounded empirical psychology (Alexandersson, 1981; Hasselgren & Beach 1997; Marton, 1981; Marton, 1986; Svensson, 1983; Svensson, 1984; and Tesch, 1990). It is one approach for dealing with the problem of *analysing the meaning that people ascribe to the world* (Saljo 1988:36), and has been categorised into three lines of inquiry. The first line of inquiry has continued to concentrate upon general aspects of learning. The second

line of inquiry concerns the learning of concepts in domains such as economics or mathematics. The third line of inquiry is characterised as *pure* phenomenographic interest, and is concerned with describing the way in which people conceive of various aspects of their world (Marton, 1986:38).

Tesch (1990:65) describes phenomenography as one research approach within a group of research methodologies, which aims at looking for commonality in understanding. Phenomenographers seek to discern patterns of understanding in non-numerical language and describe differences in the way people understand or ascribe meaning in the world around them. It is best defined as a scientific research approach that aims at *describing conceptions of the surrounding world* (Svensson, 1994:12). The emphasis is on how things appear to people in their world and the way in which people explain to themselves and others what goes on around them and how these explanations change.

According to Svensson (1984) qualitative research methodologies emphasise either scientific, philosophical or linguistic *turns*. The term *turn* means the search for the knowledge basis of support in answering questions about a research method. The *turn* of phenomenography is scientific, and the method emphasises a commitment to the phenomena being investigated. The immediate aim is to rise above present knowledge concerning the character of phenomena in order to describe phenomena in terms of their specific nature (Svensson 1984:3). Rather than emphasising the philosophical justification of the method and thus demonstrating integration between philosophy and empirical work, phenomenography emphasises the delimitation of and grouping of phenomena based upon the content and/or

situation of experience. Svensson (1984:2) explains that:

> ...*answers to questions about methods are given relative to the phenomena studied. There is an emphasis upon the specifics of the phenomena. General ontological and epistemological assumptions are considered as they are represented in the conceptions of the phenomena dealt with and the methodology concerns the implications for the treatment of the data about the phenomena.*

Methods are selected and altered in relation to the type and nature of phenomenon under investigation, in an attempt to move past a restricted approach to research that is based upon preconceived assumptions, in order to concentrate upon the character of phenomenon. Phenomenography concentrates upon phenomena similar and closely related in the participants' experience and understanding and can be as broad as physical motion (Svensson, 1989) or political power (Theman, 1983). The design and collection of data are usually based on a particular group of people and their relation to a phenomenon. Analysis is undertaken through comparison of data obtained from a group of participants in an attempt to focus upon describing the phenomenon in terms of their essential meaning. Although there are guidelines for undertaking a phenomenographic analysis (Dahlgren & Fallsberg, 1991; Hasselgren & Beach, 1997; Kvale, 1983; and Saljo, 1988), there is no single general procedure. The starting point is always the data and involves differentiation and organisation of parts in an interpretive - analytic process (Svensson, 1984; Svensson, 1994; Svensson, 1997).

Phenomenography, as with other qualitative research approaches, assumes that subjective knowledge as the object of research is a useful and informative undertaking, and that within subjective knowledge there is meaning and understanding which reflects various views of phenomena. These various views are judged to be fundamental to the way in which we act, understand, form our beliefs, and experience our world.

THE NATURE OF CONCEPTION

The most fundamental assumption concerning the object of phenomenography relates to the nature of conceptions. Phenomenography emphasises conceptions as central to describing knowledge and as such the qualitative approach is argued to be a distinct field of research (Marton 1986). It is contended that knowledge is a product of the process of thinking and is dependent upon the world that is external to the individual. Knowledge is assumed to be relational (Svensson 1983:2; Svensson, 1994:14) and involves the continual inter-relationship between thought, experience and a phenomenon.

Marton, Dall'alba & Beaty (1993) focus on the nature of conceptions, arguing there are a number of possible components of a conception comprising referential aspects (what), and structural aspects (how) with both external and internal horizons. Referential (meaning) aspects refer to the global meaning that is attributed to a phenomenon. Of what is the conception formed? Structural aspects refer to the way in which the phenomenon and its component parts are delimited and related to each other in the form of external and internal horizon of the phenomenon. **Internal horizon** refers to the *how* by which component parts of the phenomenon are understood and are related to each other. **External horizon** refers to the way in which phenomenon is delimited from, and related to, its context. The term delimit refers to the suspension of attributed meaning or definition from a preconditional perspective. A complete characterisation of a conception must include distinction between expressions that predominantly reflect a referential aspect of understanding and expressions that predominantly reflect a structural aspect. Each is a reflection of various aspects of the same

conception in that they are fragments of the same whole that is formed of a number of parts. Parts and whole both define each other as being of the same conception and are described in the outcome space. The outcome space comprises the final analysis of the research and depicts the structural and referential aspects of the conceptions (categories of description) (Gerber *et al.*, 1993; Marton, 1981; and Marton, 1988b).

Marton *et al.*, (1993:283) notes that an individual rarely expresses the conception in its complete form, and may emphasise any one or all parts and aspects. Merely asking the interviewee *what a phenomenon means*, does not in any way guarantee a reciprocal response emphasising all parts of a conception. This fact demonstrates the need to transcend merely selecting particular statements made by an interviewee in order to consider their entire context, meaning and perspective. One or two statements selected without consideration to an entire transcript and the intended meaning are inadequate.

The Relationship between Subject and Object

The need to consider the entire context, meaning and perspective also influences the relationship between subject and object. A conception is a representation of the relationship between both subject and object. A conception is at any one time both subject and object and reflects the manner in which we experience the interrelationship between both subject and object. The interrelationship reflects the experience of the phenomenon from the perspective of the phenomenon as it is experienced by each person (Marton, 1981; Marton, 1986; Marton, 1988a; Marton, 1992a; Marton, 1992b; and Saljo, 1994). Thus, in all descriptions of phenomena there is a tension between the general form of the phenomenon as it appears, and

the specific content of description or activity. This tension between subject experiencing and the object or phenomenon experienced, is a relationship that is expressed through the thought and activity of each individual. Marton (1992a:3) explains:

> ...*there are not two worlds; a real, objective world on the one hand and a subjective world of mental representations, on the other hand. There is only one world, a really existing world, which is experienced and understood in different ways by human beings. It is both subjective and objective at the same time. The experience is as much an aspect of object as it is of the subject. After all the expression "how the subject experiences the object" is synonymous with the expression "how the object appears to the subject.*

Just as there is left and right, and east, west, south and north for direction, so seemingly antithetical categories taken together constitute the formation of understanding. Conceptions arise from what at first appear to be opposites such as experience and thought or fact and illusion. It is important to recognise that of these so-called opposites, one cannot be more or less important than the other, for at any and all times, there are no intermediate stages, boundaries, nor graduations. Thus, a conception should not be thought of as neither subject nor object, but both consecutively. Between them there is a link, a relationship, a tension, an equilibrium. The latter and former would have no meaning were it not for the other. Thus, Phenomenography maintains a non-dualist ontological position. It achieves this through a second-order perspective; that is describing the world as it appears to those experiencing it. Participants are required to reflect on their meaning of experience rather than merely describing their experience.

Conceptions are established as two sides of a phenomenon: that is, the phenomenon as it is, and the relationship of the phenomenon as it is experienced (Svensson, 1983:4). They represent knowledge of an aspect of the world and have the character of products of thinking.

The formulation of a conception is different to conceptualisation, which refers to the specifics of cognitive activity. The purpose of studying conceptions is to focus upon the dominant characteristics of differences and changes in understanding rather than a deeper investigation of the cognitive processes involved in the formation of characteristics, differences and changes (Gerber, 1994b; Svensson, 1989).

Conception as Relational Knowledge

> *The choice of conception as the central kind of phenomena and concept in describing knowledge, thus meant a move from an objectivistic and inter-subjectivistic view of knowledge to a more subjective and relative view. It meant assumptions that knowledge fundamentally is a question of meaning in a social and cultural context. However, it also meant that this meaning was related to well-delimited entities and objects, having a certain complexity. Knowledge was seen as the meaning of and the understanding of wholes or complexes representing objects or phenomena* (Svensson, 1994:12).

The term *whole*, within the context of phenomenography, refers to the development of knowledge as it relates to external reality and the delimitation of parts, and is referred to as *relational knowledge*. External reality presents itself to human thinking as different related entities which possess parts and which combine to form a whole. A conception is constructed from parts that combine to form our understanding of a phenomenon. Knowledge is delimited in the sense that our conceptions portray a reality that is impossible to understand in an absolute sense. But knowledge is whole in the sense that we have knowledge that is derived from related entities, having the character of forming wholes even though ultimate understanding may be incomplete. The delimitation of knowledge confirms the necessity of not predefining meaning or experience, as meaning is made up of parts to form wholes which may, or may not, reflect shared meaning. Thus, there are always a number of differences in

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the way in which we can understand the world, and these differences arise from the whole that is derived from the context of experience.

It is therefore reasonable to suggest that the starting point in the development of a conception lies in relation to a part of reality both experienced and thought about, or alternatively arises from a combination of several experiences, and the development of ideas. The character of a conception arises from an immediately experienced part of reality or from experience and thought related to that which is common about several parts of reality and their relationship to one specific part of the surrounding world (Lybeck *et al.*, 1988; Marton, 1988b; Svensson & Theman, 1983; Svensson, 1989; and Svensson, 1994).

The relationship between conceptions as an act of understanding and experiencing phenomenon resembles the relationship between Lewis Carroll's smiling cat and the smile that is left after the figure of the cat is removed from the smile (Dahlgren, 1979). When the analysis of research data (the cat) is completed the researcher is left with a number of conceptions which are described by the categories of description (the smile). Each category of description forms part of a larger whole in which each one is related. The portrayal of the relationship between conceptions is the outcome space.

Conceptions are abstractions from reality and are formulated in various ways depending upon the context of reality. They are subject to change and are dependent upon the way in which we think, the ideas we possess, and our beliefs about the context of experience. Conceptions are both numerous and contextual, and reflect fluid variation in meaning as meaning floats

between commonplace understanding, the context of experience, and intellectual insight.

Arguments in support of the relational basis of knowledge are fundamental to phenomenography. They differ from empiristic and positivistic assumptions about knowledge, which view knowledge as evolving from observations as facts, as well as rational assumptions that view knowledge as a closed mental system. In contrast, it is assumed in phenomenography that conceptions are abstractions from reality that can be and are, formulated in various ways by individuals depending upon the context of experience.

Conceptions vary and arise from the interrelationship between our beliefs, social imperatives, expectations, and experience. The interrelationship influences our thought, debate, and the way in which we respond to the world around us. Ellul (1968:13) argues that just as there are differences in conceptions, there are also many similarities. These similarities of conceptions are referred to as *commonplace*. Commonplace conceptions are the living beliefs that are repeated and used by people as criteria for judgement, and represent individual and group hierarchies of values and philosophy. They are the explanations and justifications for the functioning of society, and are used to explain the world as it is experienced: *These rightly named commonplaces give us a curious insight into the status of the community of the world* (Ellul, 1968:15).

Rather than assuming conceptions to be an individualised experience of the world, it is argued that there are commonalities. Phenomena are understood in a limited number of common qualitatively different ways. Despite the possibility of more than one conception of

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an object or phenomenon, there is at any one time, a finite number (Dahlgren & Fallsberg, 1991; Gerber *et al.*, 1993; Marton, 1931; Marton, 1986; Saljo, 1994; Sandberg, 1994; Svensson, 1984; and Svensson, 1989).

Conceptions are generally beyond the realm of discussion and interrogation and are often at a level not perceived to be in need of evaluation. Conceptions are rarely quoted and infrequently identified, but constantly coerce our speech, thought and social arrangements. They are the by-products of our thoughts, experience, our education, our culture, our history, and the ideals and values which society insists upon, in order that we can actively participate.

On the basis of this description it is reasonable to ask the following questions: Why is it important to identify our conceptions?; Why is it necessary to expose the intellectual map which is our experience?. The answers of course, lies with the fact that conceptions determine our judgement, direct our inquiry, and are the explanations for our everyday lives and practices. To be aware of conceptions is to be aware of our social reality and ourselves. Phenomenographers thus maintain an epistemological perspective that concentrates on the *what* of thinking the meaning people ascribe to what they experience. A common question of research participants is: *What do you understand about a phenomenon?* The researcher concentrates on the description and experience of the phenomenon, and seeks to obtain a research outcome that presents to the reader, a map of quantitative variations in peoples' understanding of the world. The mapping of awareness, ways of experiencing, understanding or conceptions (these terms are indiscriminately used within the literature) takes the form of categories of description and an outcome space.

THE FRUITFULNESS OF DESCRIPTION

Categories of description have whole characteristics which represent the central meaning of conceptions, represent similarities and differences in meaning, and outline the number of qualitatively different ways a phenomenon can be described, analysed and understood (Dahlgren & Fallsberg, 1991; Gerber *et al.*, 1993; Marton, 1981; Marton, 1986; Marton, 1992a; Saljo, 1988; Saljo, 1994; Sandberg, 1994; Svensson, 1984; Svensson, 1989; Svensson, 1994; and Svensson, 1997).

Categories of description are formed from an analysis of data abstracted from interview transcripts or any other form of communication (e.g. drawings, dance, and videotape) and are an abstract tool used to characterise understanding. For example, interview transcripts provide the reader with a formalised summary of description. Parts of data are abstracted from entire transcript and condensed to portray meaning. Commons meaning of meanings are presented as categories that may be then compared and grouped as an expression of understanding. Thus, categories of description are forms of expressing conceptions of the object of study within the context of the reality portrayed by interviewees. The categories may not represent the entire range of possible conceptions of a phenomenon, but do express the meaning of the phenomenon within the context as experienced by the interviewee. Throughout the process the fundamental characteristic of the phenomenon originating from the experience of those interviewed is preserved, as is the essential meaning as expressed in the organisation of the content of experience. The significance of the categories of description is exposed within the similarities and differences described by the entire categorisation

(outcome space) and are thus open for interpretation and attention (Marton *et al.*, 1993; Svensson, 1984; Svensson, 1994; and Svensson, 1997).

The **outcome space** is a diagrammatic or empirical representation of the relationship between conceptions (categories of description). Similarities and differences from experience and understanding of a phenomenon can be viewed as a system of conceptual order. Marton (1981:198) refers to this system as *collective intellect*, and this collective intellect is described as a structured pool of ideas, beliefs, facts, etc., which underlie interpretation and the construction of reality. The phenomenographic approach describes the collective intellect in the form of an outcome space which is an empirical map of the *qualitatively different ways in which people experience, conceptualise, perceive, and understand various aspects of, and phenomena in, the world around them* (Marton, 1986:31). In order to identify conceptions and the outcome space there are method assumptions that must be considered during the research process.

ASSUMPTIONS OF METHOD

There are particular assumptions relating to phenomenography which need to be understood within the larger context of understanding the previous discussion concerning the relational nature of conceptions (Svensson, 1983; Svensson, 1984; and Svensson, 1994). The phenomenographic approach generally takes the form of a semi-structured interview in which the relation of the individual to the whole qualities is explored, highlighted and described. The interview process emphasises a need for sensitivity to the way in which each person delimits the object of study, yet is both explorative and directive in its approach and ambition.

The researcher wishes the interviewee to discuss the object of study. There evolves from the explorative reflective interview, an interview transcript that is analysed in its entirety, not from the perspective of linguistic elements, but from the point of view of expressing understanding in relation to each part of the world. The approach emphasises the content of description rather than the language used, which is always subordinate to the expressed content as the focus of analysis.

Svensson (1994:19) notes that what counts as the same conception in an analysis of transcripts, can be expressed in many forms of language. Therefore, it is noted that fundamental to an analysis of a phenomenographic interview is the need to base the interpretation of the delimitation and differentiation of the parts of a phenomenon on firstly, the whole content of their referential meaning rather than the sequence of the data. Secondly, analysis concentrates upon the form and content of the whole qualities of the objects of study.

Phenomenography is less a methodology than an explorative and analytic approach to qualitative research, which is best described as contextual analysis. The explorative nature of data collection and the need to scrutinise each transcript in its entirety favour the adoption of an analytic approach. The term contextual analysis is used as it appropriately describes the activity of phenomenography, because the researcher is required to immerse him or her self in an entire body of material and to identify analytical differences between data. Analysis aims at highlighting significant parts and aspects from whole data on the basis of themes or perspectives of the object of study (Svensson, 1984; Svensson, 1994; and Svensson, 1997).

The outcome of the research analysis is a description of the experience of a phenomenon that reflects as close as possible, the meaning of the research data. The approach seeks to retain the participants' language in a descriptive form and an emphasis that presents to the reader the meaning of the interviewees. Rather than engaging in a reduction of language to another form, as in phenomenology, the outcome of the research approach of phenomenography never departs from a portrayal of the language of the participants. The outcome of the research purposefully remains at a descriptive level and is presented in the form of categories of description. Categories of description are relational, experimental, content orientated, and quantitative. They highlight that which is commonplace and relational about what we experience in the world. They are a potent source of explanation for differences in conceptions. The presentation of the research outcome in the form of categories of description have been found to reflect the reasons why each person responds to and engages with, objects and phenomenon (Marton, 1992a).

Consequently, phenomenographic studies not only describe and illuminate the essential meaning of phenomenon, but add to our understanding of phenomena by presenting the way in which people respond to their world (Marton, 1992a:5). Through contributing to understanding phenomena as described and experienced an important achievement to interpretation is achieved. The research approach not only adds to the body of knowledge of how and what we experience, but places our experience within the framework of our understanding of phenomena. Phenomenographers highlight how the world is understood and experienced by people and may include truths about reality; collective illusions; myths; assumptions; beliefs; fantasy; and faith.

Summary

Phenomenographic interpretation of experience and understanding is discrete, and should not be confused with other qualitative approaches. Phenomenographers are interested in the content of thinking, rather than the process of perception or conceptualisation (Marton, 1986:32). Rather than seeking overarching laws of thought and perception, thinking is described in terms of what is both experienced and thought about. As an approach to qualitative research, phenomenography is the process of describing various specific phenomena as they appear and create meaning for us and has application to researching health care. The approach does not seek to formulate general principles about how things appear. The ultimate goal is to describe the qualitatively different ways in which we understand phenomena in the world around us. Although phenomenography adopts a unique empirical approach to the interpretation and presentation of knowledge, the approach shares with other qualitative approaches a willingness to transcend research results in the form of variable-based quantitative description.

PHENOMENOGRAPHIC METHOD FOR RESEARCHING CONCEPTIONS OF TECHNOLOGY IN CONTEMPORARY SURGICAL NURSING

This section outlines the research method that was adopted in order to undertake the current study and includes an explanatory research plan, together with statements on the collection of data and analysis.

Plan of the object of study

The purpose of this research has been to determine and describe the qualitatively different ways surgical nurses understand and experience technology. As highlighted in the review of literature, nurses have written often about nursing and technology from the perspective of the way nurses *ought to practice* but there is limited research addressing the phenomenon and discourse has a tendency to be sanguine. Current knowledge lacks clear explanation and research evidence to inform the discipline of the relationship between nursing and technology. In order to assist the process of addressing these deficits it was found to be of significant and illuminating value to establish how contemporary surgical nurses' experience and understand technology because research evidence drawn from experience and understanding will assist the development of insight into the phenomenon and the future development of nursing practice, theory and education.

Eligibility criteria

The research consisted of reflective individualised interviews with twenty (20) registered nurses currently working in surgical nursing within Southeast Queensland (eighteen (18) female and two (2) male). Participation in the research was voluntary. Registered nurses were preferred to enrolled nurses due to their involvement in all aspects of nursing practice (as per government legislation), and because registered nurses make up the largest body of nurses employed currently in the domain of surgical nursing.

Volunteers were obtained from both a metropolitan hospital within Brisbane and from a large number of registered nurses who were both currently working in surgical nursing and

undertaking part-time study at the Queensland University of Technology. All nurses were employed in various hospitals within and outside of Brisbane. Participants varied in length of nursing experience from one (1) to thirty-five (35) years and had various levels of seniority within the profession ranging from beginning practitioner (level one) to Clinical Nurse Consultant (level three). They worked in health care facilities caring for all age groups across the life span. Many of the nurses had been employed previously in surgical units outside of Southeast Queensland and all worked currently in surgical units ranging from general wards to specialist units. It was assumed that all registered nurses shared a common reality of surgical nursing practice and the choice of surgery as the domain of practice located all nurses within a contemporary context.

The phenomenographic interview

The research approach took the form of both a semi-structured interview and the creation of a picture. The use of a semi-structured interview remains the most common method of generating data within a phenomenographic approach and is undertaken in order to understand another person's meaning of their experience of a phenomenon (Bruce, 1992; Dahlgren & Fallsberg, 1991; Entwistle, 1997; Kvale, 1983; and Marton, 1988a). Interviews were undertaken with the assistance of predetermined entry questions (see pilot study) which were incorporated in order to assist the interviewee to reflect upon the phenomenon of technology from their own professional frame of reference. Each interview developed according to both the interviewee's discourse and his or her response to the semi-structured questions. Where appropriate each person was invited to explain further his or her understanding and examples were used in order to make clear the intent and language of the

interviewee.

Notwithstanding, there were no attempts to lead a person's response, discussion or explanation during an interview. The intention of the interviewer during each interview was to focus on the phenomenon of technology as experienced by the interviewee and to foster a liberal interview structure, a relaxed interpersonal relationship and a feeling of individual freedom. To achieve the goal of a phenomenographic interview the interviewer was required to adopt an accepting attitude, a relaxed (friendly) interview style and a genuine interest in what the person had to say. All interviewees were encouraged by this approach and outlined their experience and understanding from a personal perspective.

The interviews were not structured events in which interviewees were required to respond in a stimulus - response or behavioural manner. Each interview focused on the world of the person and revealed their beliefs, values, illusions, reality, feelings and experience of the phenomenon of technology in their surrounding environment. The interviewer remained cognisant of the recommendations of Kvale (1983) who suggested twelve (12) goals specific to qualitative interviewing. An interview should be: theme centred; interpersonal; based on an assumption of shared meaning; qualitative in nature; descriptive; particular in intent; presumptionless; supported by minimal ambiguity; able to be altered; sensitive to each person; focussed on a phenomenon; and a positive experience for all people.

Assumptions common to phenomenological research were preserved also during both the interview and analysis phases of the research, and were essential to the quality of the research

outcome. The rule of epoche (bracketing); the rule of description focus (rather than explanation focus); and the rule of horizontalisation (the ascribing of equal value to all description and experience) guided each interview and subsequent analysis of transcript. Techniques utilised during interviews were; silence, open questioning in order to encourage conversation, and the use of non-technical and non-threatening language and questions which always began with a pronoun such as **what** rather than an adverb such as **why**. Discussion evolved from each interviewee's reflection on technology and can be described best as a conversation which was devoted to a specific task (Mishler, 1986).

The interview process sought to gain insight into each person's understanding and experience. Reflection on experience was the principal goal and the outcome of each interview was contingent more or less on clarity and explanation. Less clear explanation required further discussion in order to encourage the person to reflect on the nature of the phenomenon and to make clear his or her meaning. Questions such as *could you explain that further?* or *what is an example?* were necessary and useful prompts when explanations were unclear or when the interviewer did not understand the persons meaning (Bruce, 1992; Marton, 1992b; and Patton, 1990).

Bruce (1992:3) explains that when seeking to explain experience an interviewee will express two levels of understanding. The levels of understanding are referred to as the person's internal and external horizons. Both levels of understanding were sought from interviewees. The **internal horizon** consists of the designated characteristics of a phenomenon, which are based on understanding which is both clear and accepted, and which are delimited in relation

to related parts of a concept. The **external horizon** is the outer boundary of understanding, where explanation and ideas become *fuzzy* or *unclear*. At this level understanding and experience can be vague and is pre-reflective. Understanding and experience become subject to specific reflection often for the first time and concepts are delimited from others within a context. For example, the person may confide to the interviewer that they *had not thought about a particular question or issue before* or they may be vague and unsure about what they are trying to say. Discussion that relied upon the external horizon of understanding required supportive prompting from the interviewer, since interviewees were at the outer boundaries of their experience.

The creation of a picture for the research interview is a less common although accepted research approach within phenomenography (Bruce, 1992; Kwan & Gerber, 1994; Marton 1988a; and Wenestam, 1984). Towards the completion of each interview the nurse was asked to create a picture of the impact of technology on contemporary surgical nursing. The request stimulated various responses and encouraged further examination of the phenomenon from the perspective of what each nurse had experienced. Each person was requested to *create a picture* rather than draw their understanding. The request to draw was seen as a threatening prospect. The idea of creating a picture that had no preference for detail or simplicity allayed fears concerning artistic ability (pictures ranged from simple stick figures to detailed representations of experience). People who stated they were not able to draw were always willing to create a picture of their understanding.

After creating his or her picture the nurse was asked to explain what he or she was trying to

portray. Clarification was sought when the interviewee's understanding was unclear to the interviewer and when pictures were not explained fully. On occasions, some interviewee's were asked about the organisation of their picture. For example, it was common for nurses to depict machinery between a nurse and a patient. The reasons for the portrayal were sought, as was the intent of the picture.

Each picture created was an expression of the experience of technology. Through pictures a process arose where by artistry reflected more or less, conceptions verbalised during an interview. The structural relationship between the person experiencing and the phenomenon experienced was portrayed further through diagrammatic portrayal. Just as a map refers more or less to the structure intended by a map designer (Kwan & Gerber, 1994:243) so a diagrammatic representation of a person's understanding in the form of a picture reflects the relationship between the person and the phenomenon experienced. Created pictures represent the **what** aspect of *what do you understand* and within the context of the current research they have been a valuable form of expression and research data.

Pilot study

Questions to be used in the research were trialled through the use of a pilot study. Two (2) surgical nurses were interviewed using the set of prearranged questions outlined below. The pilot study served to justify the usefulness and appropriateness of interview questions and ascertain their ability to stimulate reflection on technology from the perspective of the nurses' experience.

Non-technical questions (open-ended questions which were without specific technical orientation or aligned toward a particular view) constituted the semi-structured interview and arose from common issues addressed in nursing literature. Common issues such as; the influence of technology on the professional development of nurses (What does technology mean to the development of nursing?), the role of nurses in relation to technology (What role does technology have in your nursing practice?), and the way nurses' practice in contemporary surgical nursing (What ways does technology influence your nursing practice?) were included as questions as were questions asking each nurse to define technology and discuss the way technology might manifest (What is your definition of technology?; What forms of technology are there where you work?). The intent was to ask each nurse to reflect on his or her experience and understanding of technology. The questions were justified on the basis of their commonality as areas of concern in nursing literature (except for the issue of defining technology which was highlighted by Barnard (1996a) as an unaddressed issue) and allowed the nurse to move from the concrete to the abstract. Questions directed each nurse to reflect on the phenomenon from their own experience and accounted for their personal understanding rather than the perspective or opinion of the researcher. Interviews were individualised, conducted in a quiet room and included all of the following questions:

SEMI-STRUCTURED INTERVIEW QUESTIONS

What role does technology have in your nursing practice?

What ways does technology influence your nursing practice?

What forms of technology are there where you work?

What does technology mean to the development of nursing?

What is your definition of technology?

CREATING A PICTURE

Create a picture of the impact of technology on nursing practice.

Please explain your picture.

The pilot study found the questions to be appropriate, clearly understood and stimulated reflection on the phenomenon. Due to the success of the pilot study the methods outlined above were not altered for the research.

Collection of data

Semi-structured interviews with twenty (20) surgical nurses were audiotaped and later transcribed verbatim for the generation of data. Pictures that were created during the interview process were reviewed when analysing interview transcripts. They constituted important data particularly when interviewees referred specifically to their picture. Transcripts and pictures obtained from interviews constituted the body of data for the analysis that is presented in chapter four (4).

Analysis of data

The research approach of Phenomenography seeks to describe qualitatively the way people understand and experience their world and is descriptive rather than interpretative. Analysis and presentation of research findings take the form of unfolding categories of description, which are a representation of the number of qualitatively different ways a phenomenon is

experienced. Although the literature is not overly prescriptive in relation to conducting analysis (due primarily to a need to vary the treatment of data depending upon the type of phenomenon being studied and the results obtained (Svensson 1984:22)), the analysis method chosen for use in this research was described by Dahlgren and Fallsberg (1991). They outlined seven (7) steps that are entitled: familiarisation, condensation, comparison, grouping, articulating, labeling, and contrasting. Each step was completed as recommended and described.

Familiarisation required the researcher to read through transcripts carefully in order to become acquainted with data. The beginning of the analysis involved listening to original audiotapes and comparing the audiotapes to typed manuscripts. This allowed for the correction of words and the identification of discourse not included within transcripts. The process encouraged familiarisation with the content of each transcript. Additionally, the step began the process of identifying *meaning units*.

Meaning units evolved to be important words or sections of transcript identified with regards to the nurses' experience of technology. As the research analysis progressed meaning units developed eventually to become shared meanings from within the body of all interviews rather than meaning attributable to any one individual.

Condensation referred to the identification of significant statements made by participants that represented a summary of their dialogue. These were short generally and representative of experience. They reflected the intent or meaning of the person and become the meaning

units that were compared and organised according to qualitative differences. They were identified within transcripts by a marker pen and subsequently removed for analysis. It must be noted that meaning units were identified on the basis of the individual's intent as described in an entire transcript rather than any specific statement or words. At this stage of analysis the transcripts selected were representative of the context and meaning of the individual.

Comparisons referred to the process where by identified meaning units from each transcribed interview were compared in order to search for similarities and differences. Meaning units were organised according to general variation and agreement prior to the formal process of organising into specific groups.

Grouping referred to the process whereby individual meaning units were grouped together on the basis of similar meaning. This amounted to the formation of categories of transcripts. The process of group formation was repeated on numerous occasions in order to establish appropriate categories and to ensure the process was both comprehensive and unbiased.

Articulating referred to the stage when beginning attempts were made to describe and explain the experience of each category. As with the previous step (grouping) this process was repeated a number of times until each category was both satisfactorily described and explained using words that reflected the language and intent of the nurses.

Labelling involved the process by which categories were denoted by the construction of linguistic expression arising from and suitably reflecting the content of description.

Contrasting involved a process where by categories were compared for similarity and differences in order to identify logical relationships. This process concluded with the identification of a structural relationship between conceptions and the construction of an outcome space. The research analysis progressed to the point where by a hierarchical diagrammatic representation of the relationship between conceptions of technology in contemporary surgical nursing was identified.

Results and interpretation based on the phenomenographic tradition

Analysis of data is presented in the form of categories of description, which represent the qualitatively different conceptions of technology. The conceptions do not relate necessarily to any one individual interviewed as they reflect understanding and experience common to all data. Conceptions reflect the relation between the person's experience and understanding and the phenomenon that is experienced and understood.

The relationship between conceptions are described in the outcome space (figure eleven (11)). The outcome space constitutes a major outcome of the study and is presented for the reader as a hierarchical picture. Interpretation and comment in relation to the outcome space relates in the first instance to the context from which data has been drawn (contemporary surgical nursing), and in the second instance to theoretical and practical implications.

As noted the outcome space is defined by its structural and referential aspects which refer to the two correlated poles of intentionality known as the neomatic correlate for conceived

meaning, and the noetic correlate for the conceiving act (described previously by Husserl as *noema* and *noesis*) (Sandberg, 1994:55). The outcome space represents elements of the meaning and act as constructed by the person experiencing and understanding the phenomenon.

Credibility and quality of research

The following measures have been important in establishing this thesis as a work that is both credible and of quality. Since the intention of a phenomenographic program is conceptual rather than statistical, it is argued that rather than issues of validity and reliability (in a quantitative sense) being the focus of consideration, a rigorous adherence to the tenets of research design, data collection, analysis and reporting establish credibility and lead to an appraisal of quality research, in so far as the phenomenographic approach as a tradition is manifest and accepted (Clarke, 1995; Gerber, 1994b; Kvale, 1983; Marton, 1995; Sandberg, 1994; and Sandberg, 1997). Marton (1995:169) notes that:

> *...no reliability measures can ever be other then necessary, but not sufficient, conditions for accepting the results. Nevertheless, it seems reasonable that categories of description that we develop might be useful for other people, as instruments for making sense of and describing phenomena which we have studied and which they find in other contexts.*

Credibility means *the quality of being believable; reliable; trustworthy* (Barnhart & Barnhart, 1994:486). Credibility in this research has been established because the researcher has strove to relay the experience and understanding of the phenomenon via an accepted research approach. In addition, credibility has been established because the researcher has demonstrated he is well versed or familiar with the area of study (i.e. well informed on the matter in question) and that he has implemented the procedures faithfully.

Maximisation of quality (**quality** meaning: *grade of excellence* (Barnhart & Barnhart, 1994:1703)) has arisen from reliable application of the research tenets of phenomenography in accordance with the epistemology of intentionality rather than a reliance on strict *objectivity* and the search for *the truth* about the experience and understanding of the phenomenon (Gerber, 1994b; Sandberg, 1997). For example, research questions included in semi-structured interviews originate from general areas of discussion common to nursing literature rather than from preconceived views of the researcher and allowed each person to account for their own experience and understanding within their own frame of reference. Nurses included in the research were self-selected on the basis of interest in the research project. During all phases of the research the researcher adhered to phenomenological rules. Also, the results have been reported in a manner, which separate clearly the findings of the research from the critical analysis of the researcher.

In addition, the categories of description and outcome space demonstrate the quality of the phenomenographic project. Results reflect clarity of conceptual horizon and a minimisation of competing conceptions (Sandberg, 1994). Each conception is identifiable as uniquely different from the other, yet able to be portrayed by the outcome space as the qualitatively different ways of experiencing and understanding technology.

Lastly, the researcher has maintained an interpretative awareness during the research process and explicitly made obvious known beliefs, opinions and bias which are particular to the researcher. An appreciation of how personal interpretation influences the research process has

added to the quality of the research outcome. Through the establishment of a *perspectival subjectivity* (Sandberg, 1997) opinion has been made clear, arguments have been made obvious, and bias has been placed before the reader. Awareness of personal beliefs, etc., became an advantage to the research because awareness of the possibility of bias assisted in the establishment of an appreciation of the need to bracket personal assumptions etc. Rather than personal interpretation being a liability of the research, the laying open of assumptions, views, etc., have been a strength which have assisted to make the research as reliable as possible.

Ethical issues

Permission to conduct the research was given by the Ethics Committee of the Queensland University of Technology. The Ethics Committee required the researcher to obtain permission from each individual participating in the research study, and to maintain confidentiality. All nurses interviewed signed a form stating they gave permission to be interviewed and for data to be both analysed and published (see appendix 3). Nurses and employers have not been identified within the body of this thesis. All audiotapes, transcripts and pictures have been stored safely.

CONCLUSION

This chapter has presented an outline of phenomenography as a research approach as well as method utilised in the current research. Assumptions of the approach of phenomenography have been discussed with particular emphasis upon the holistic and relational nature of knowledge; the need to understand conceptions of phenomena from the perspective of how

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phenomena are experienced and described; the descriptive nature of the research approach; and the need to delimit meaning when undertaking phenomenographic research. The chapter has explained research design and the collection of research data, analysis, and interpretation. From the perspective of the research, all efforts have been made to adhere to the rules of qualitative inquiry and to undertake phenomenographic research adhering to accepted tenets of the research approach.

The following chapter is a presentation of research findings. Conceptions of technology (categories of description) identified by the research are described and an outcome space for the qualitatively different ways technology is experienced and understood by contemporary surgical nursing is included. The chapter details the outcome of the research process.